

Supplementary Model Outputs for

Impact of light on well-being and mood in everyday life: A longitudinal study on timing, quantity, duration, and frequency of exposure

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This supplementary PDF file contains summaries of all fitted models.

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OUTCOME: anxiety
EXPOSURE: DAY_10_11
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6269 -0.5510 -0.0975 0.5939 6.1819

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.046 1.745
Residual 1.958 1.399
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.608881 0.433594 12.936
log_within -0.009585 0.009461 -1.013
log_between -0.194177 0.070174 -2.767
sexM -0.359150 0.306341 -1.172
age -0.031673 0.009771 -3.242
wakeupTime_dec -0.169418 0.017782 -9.527

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.171
log_between -0.317 0.050
sexM -0.186 -0.004 0.069
age -0.672 0.010 -0.288 -0.061
wakeupTm_dc -0.436 0.392 0.128 -0.010 0.026

Robustness weights for the residuals:
4387 weights are ~= 1. The remaining 1273 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.550 0.732 0.714 0.891 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.355 0.714 0.863 0.812 0.961 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	5.61	0.43	[4.76, 6.46]	12.94	< .001
log within	-9.58e-03	9.46e-03	[-0.03, 0.01]	-1.01	0.311
log between	-0.19	0.07	[-0.33, -0.06]	-2.77	0.006
sex [M]	-0.36	0.31	[-0.96, 0.24]	-1.17	0.241
age	-0.03	9.77e-03	[-0.05, -0.01]	-3.24	0.001
wakeupTime dec	-0.17	0.02	[-0.20, -0.13]	-9.53	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.75
SD (Residual)	1.40

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=====
OUTCOME: anxiety
EXPOSURE: DAY_11_12
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6256 -0.5461 -0.0975 0.5966 6.2456

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.015 1.736
Residual 1.963 1.401
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.037899 0.477874 12.635
log_within -0.028159 0.010501 -2.682
log_between -0.241834 0.082464 -2.933
sexM -0.336384 0.304266 -1.106
age -0.033086 0.009586 -3.452
wakeupTime_dec -0.175509 0.017168 -10.223

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.125
log_between -0.523 0.035
sexM -0.167 -0.004 0.034
age -0.572 0.011 -0.239 -0.050
wakeupTm_dc -0.407 0.308 0.113 -0.014 0.035

Robustness weights for the residuals:
4391 weights are ~= 1. The remaining 1269 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.215 0.552 0.732 0.712 0.892 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.351 0.728 0.853 0.815 0.966 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	6.04	0.48	[5.10, 6.97]	12.63	< .001
log within	-0.03	0.01	[-0.05, -0.01]	-2.68	0.007
log between	-0.24	0.08	[-0.40, -0.08]	-2.93	0.003
sex [M]	-0.34	0.30	[-0.93, 0.26]	-1.11	0.269
age	-0.03	9.59e-03	[-0.05, -0.01]	-3.45	< .001
wakeupTime dec	-0.18	0.02	[-0.21, -0.14]	-10.22	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.40

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=====
OUTCOME: anxiety
EXPOSURE: DAY_12_13
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.7241 -0.5476 -0.0981 0.5936 6.1480

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.024 1.739
Residual 1.973 1.405
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.151393 0.552067 11.142
log_within -0.033548 0.011733 -2.859
log_between -0.242727 0.101469 -2.392
sexM -0.333082 0.304924 -1.092
age -0.035375 0.009487 -3.729
wakeupTime_dec -0.170587 0.016764 -10.176

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.077
log_between -0.677 0.021
sexM -0.160 -0.003 0.045
age -0.485 0.009 -0.185 -0.050
wakeupTm_dc -0.363 0.211 0.100 -0.012 0.042

Robustness weights for the residuals:
4381 weights are ~= 1. The remaining 1280 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.558 0.739 0.716 0.893 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.352 0.652 0.825 0.787 0.944 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	6.15	0.55	[5.07, 7.23]	11.14	< .001
log within	-0.03	0.01	[-0.06, -0.01]	-2.86	0.004
log between	-0.24	0.10	[-0.44, -0.04]	-2.39	0.017
sex [M]	-0.33	0.30	[-0.93, 0.26]	-1.09	0.275
age	-0.04	9.49e-03	[-0.05, -0.02]	-3.73	< .001
wakeupTime dec	-0.17	0.02	[-0.20, -0.14]	-10.18	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.40

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=====
OUTCOME: anxiety
EXPOSURE: DAY_13_14
=====
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6140 -0.5441 -0.0945 0.5972 6.1560

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.071 1.752
Residual 1.965 1.402
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.179935 0.642092 9.625
log_within -0.012454 0.011576 -1.076
log_between -0.257649 0.124696 -2.066
sexM -0.377680 0.307352 -1.229
age -0.035417 0.009499 -3.729
wakeupTime_dec -0.162434 0.016496 -9.847

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.045
log_between -0.772 0.011
sexM -0.156 -0.002 0.057
age -0.416 0.007 -0.150 -0.051
wakeupTm_dc -0.307 0.145 0.073 -0.013 0.049

Robustness weights for the residuals:
4377 weights are ~= 1. The remaining 1282 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.556 0.737 0.715 0.892 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.376 0.641 0.827 0.780 0.923 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	6.18	0.64	[4.92, 7.44]	9.62	< .001
log within	-0.01	0.01	[-0.04, 0.01]	-1.08	0.282
log between	-0.26	0.12	[-0.50, -0.01]	-2.07	0.039
sex [M]	-0.38	0.31	[-0.98, 0.22]	-1.23	0.219
age	-0.04	9.50e-03	[-0.05, -0.02]	-3.73	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.13]	-9.85	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.75
SD (Residual)	1.40

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=====
OUTCOME: anxiety
EXPOSURE: DAY_14_15
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6692 -0.5498 -0.0974 0.5928 6.1564

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.145 1.774
Residual 1.963 1.401
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.320092 0.676378 7.866
log_within -0.014586 0.010596 -1.377
log_between -0.053581 0.130454 -0.411
sexM -0.346256 0.311538 -1.111
age -0.037779 0.009523 -3.967
wakeupTime_dec -0.155142 0.016385 -9.469

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.024
log_between -0.794 0.004
sexM -0.174 -0.001 0.083
age -0.461 0.005 -0.068 -0.048
wakeupTm_dc -0.270 0.088 0.041 -0.013 0.057

Robustness weights for the residuals:
4377 weights are ~= 1. The remaining 1282 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.552 0.736 0.716 0.893 0.999

Robustness weights for the random effects:
147 weights are ~= 1. The remaining 25 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.372 0.603 0.812 0.766 0.948 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	5.32	0.68	[3.99, 6.65]	7.87	< .001
log within	-0.01	0.01	[-0.04, 0.01]	-1.38	0.169
log between	-0.05	0.13	[-0.31, 0.20]	-0.41	0.681
sex [M]	-0.35	0.31	[-0.96, 0.26]	-1.11	0.266
age	-0.04	9.52e-03	[-0.06, -0.02]	-3.97	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.12]	-9.47	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.77
SD (Residual)	1.40

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=====
OUTCOME: anxiety
EXPOSURE: DAY_15_16
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6751 -0.5462 -0.0963 0.5977 6.1103

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.101 1.761
Residual 1.963 1.401
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.769232 0.655378 8.803
log_within -0.017310 0.010447 -1.657
log_between -0.160632 0.122587 -1.310
sexM -0.332104 0.308499 -1.077
age -0.038225 0.009436 -4.051
wakeupTime_dec -0.156717 0.016355 -9.582

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.019
log_between -0.781 0.003
sexM -0.140 -0.001 0.037
age -0.541 0.004 0.015 -0.042
wakeupTm_dc -0.280 0.069 0.046 -0.015 0.061

Robustness weights for the residuals:
4379 weights are ~= 1. The remaining 1280 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.220 0.556 0.736 0.716 0.893 0.999

Robustness weights for the random effects:
145 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.384 0.609 0.792 0.777 0.937 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	5.77	0.66	[4.48, 7.05]	8.80	< .001
log within	-0.02	0.01	[-0.04, 0.00]	-1.66	0.098
log between	-0.16	0.12	[-0.40, 0.08]	-1.31	0.190
sex [M]	-0.33	0.31	[-0.94, 0.27]	-1.08	0.282
age	-0.04	9.44e-03	[-0.06, -0.02]	-4.05	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.12]	-9.58	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.76
SD (Residual)	1.40

=====
OUTCOME: anxiety
EXPOSURE: DAY_16_17
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6811 -0.5479 -0.0971 0.5959 6.1771

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.128 1.769
Residual 1.956 1.399
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.947731 0.624699 9.521
log_within -0.014886 0.010614 -1.403
log_between -0.224703 0.129684 -1.733
sexM -0.307961 0.310115 -0.993
age -0.038331 0.009474 -4.046
wakeupTime_dec -0.156946 0.016286 -9.637

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.020
log_between -0.754 0.003
sexM -0.072 -0.001 -0.060
age -0.557 0.004 0.000 -0.042
wakeupTm_dc -0.284 0.070 0.038 -0.019 0.060

Robustness weights for the residuals:
4389 weights are ~= 1. The remaining 1272 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.553 0.736 0.713 0.887 0.999

Robustness weights for the random effects:
146 weights are ~= 1. The remaining 26 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.399 0.624 0.796 0.778 0.933 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	5.95	0.62	[4.72, 7.17]	9.52	< .001
log within	-0.01	0.01	[-0.04, 0.01]	-1.40	0.161
log between	-0.22	0.13	[-0.48, 0.03]	-1.73	0.083
sex [M]	-0.31	0.31	[-0.92, 0.30]	-0.99	0.321
age	-0.04	9.47e-03	[-0.06, -0.02]	-4.05	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.13]	-9.64	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.77
SD (Residual)	1.40


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=====
OUTCOME: anxiety
EXPOSURE: DAY_17_sunset
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6513 -0.5519 -0.0965 0.6009 6.1681

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.156 1.777
Residual 1.954 1.398
Number of obs: 5655, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.730367 0.601761 9.523
log_within -0.015548 0.011323 -1.373
log_between -0.199696 0.151712 -1.316
sexM -0.285142 0.313293 -0.910
age -0.039171 0.009524 -4.113
wakeupTime_dec -0.158124 0.016299 -9.701

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.016
log_between -0.729 0.001
sexM -0.032 -0.001 -0.123
age -0.611 0.003 0.042 -0.047
wakeupTm_dc -0.283 0.056 0.024 -0.019 0.060

Robustness weights for the residuals:
4381 weights are ~= 1. The remaining 1274 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.549 0.737 0.714 0.892 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.391 0.630 0.857 0.798 0.976 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5648)	p
(Intercept)	5.73	0.60	[4.55, 6.91]	9.52	< .001
log within	-0.02	0.01	[-0.04, 0.01]	-1.37	0.170
log between	-0.20	0.15	[-0.50, 0.10]	-1.32	0.188
sex [M]	-0.29	0.31	[-0.90, 0.33]	-0.91	0.363
age	-0.04	9.52e-03	[-0.06, -0.02]	-4.11	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.13]	-9.70	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.78
SD (Residual)	1.40

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=====
OUTCOME: anxiety
EXPOSURE: DAY_8_9
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----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6241 -0.5501 -0.0961 0.5980 6.1368

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.104 1.762
Residual 1.968 1.403
Number of obs: 5662, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.947537 0.415285 11.914
log_within 0.013285 0.008850 1.501
log_between -0.105047 0.066527 -1.579
sexM -0.394938 0.310409 -1.272
age -0.034505 0.009626 -3.585
wakeupTime_dec -0.144893 0.017942 -8.076

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.166
log_between 0.029 0.051
sexM -0.170 -0.002 0.113
age -0.829 0.016 -0.193 -0.063
wakeupTm_dc -0.413 0.403 0.128 -0.004 0.039

Robustness weights for the residuals:
4382 weights are ~= 1. The remaining 1280 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.555 0.739 0.716 0.890 0.999

Robustness weights for the random effects:
146 weights are ~= 1. The remaining 26 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.359 0.633 0.834 0.776 0.928 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5655)	p
(Intercept)	4.95	0.42	[4.13, 5.76]	11.91	< .001
log within	0.01	8.85e-03	[0.00, 0.03]	1.50	0.133
log between	-0.11	0.07	[-0.24, 0.03]	-1.58	0.114
sex [M]	-0.39	0.31	[-1.00, 0.21]	-1.27	0.203
age	-0.03	9.63e-03	[-0.05, -0.02]	-3.58	< .001
wakeupTime dec	-0.14	0.02	[-0.18, -0.11]	-8.08	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.76
SD (Residual)	1.40

```

=====
OUTCOME: anxiety
EXPOSURE: DAY_9_10
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.7172 -0.5490 -0.0935  0.5981  6.0975

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    3.049     1.746
Residual                   1.956     1.399
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.972874   0.418100  11.894
log_within      0.027210   0.009000   3.023
log_between    -0.132507   0.064032  -2.069
sexM            -0.373056   0.306636  -1.217
age            -0.032610   0.009655  -3.378
wakeupTime_dec -0.132286   0.018294  -7.231

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.196
log_between -0.147  0.060
sexM        -0.182 -0.004  0.074
age         -0.767  0.014 -0.244 -0.060
wakeupTm_dc -0.442  0.444  0.136 -0.008  0.032

Robustness weights for the residuals:
4399 weights are ~= 1. The remaining 1262 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.221  0.552   0.732   0.712  0.888   0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.350  0.719   0.899   0.815  0.955   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.97 | 0.42 | [ 4.15, 5.79] | 11.89 | < .001
log within | 0.03 | 9.00e-03 | [ 0.01, 0.04] | 3.02 | 0.003
log between | -0.13 | 0.06 | [-0.26, -0.01] | -2.07 | 0.039
sex [M] | -0.37 | 0.31 | [-0.97, 0.23] | -1.22 | 0.224
age | -0.03 | 9.65e-03 | [-0.05, -0.01] | -3.38 | < .001
wakeupTime dec | -0.13 | 0.02 | [-0.17, -0.10] | -7.23 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.75
SD (Residual) | 1.40

```

```
=====
OUTCOME: anxiety
EXPOSURE: DAY_sunrise_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6401 -0.5462 -0.0952 0.5989 6.1479

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.143 1.773
Residual 1.969 1.403
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.963007 0.440722 11.261
log_within 0.014711 0.011684 1.259
log_between -0.055981 0.091186 -0.614
sexM -0.367565 0.312403 -1.177
age -0.037169 0.009531 -3.900
wakeupTime_dec -0.152079 0.017024 -8.933

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.092
log_between 0.345 0.025
sexM -0.124 -0.002 0.116
age -0.819 0.014 -0.082 -0.052
wakeupTm_dc -0.344 0.269 0.092 -0.007 0.054

Robustness weights for the residuals:
4392 weights are ~= 1. The remaining 1269 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.556 0.733 0.713 0.889 0.999

Robustness weights for the random effects:
145 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.366 0.626 0.825 0.785 0.956 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.96	0.44	[4.10, 5.83]	11.26	< .001
log within	0.01	0.01	[-0.01, 0.04]	1.26	0.208
log between	-0.06	0.09	[-0.23, 0.12]	-0.61	0.539
sex [M]	-0.37	0.31	[-0.98, 0.24]	-1.18	0.239
age	-0.04	9.53e-03	[-0.06, -0.02]	-3.90	< .001
wakeupTime dec	-0.15	0.02	[-0.19, -0.12]	-8.93	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.77
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.7745 -0.5196 -0.0802 0.5717 6.3486

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.642 1.625
Residual 1.658 1.288
Number of obs: 2255, groups: id, 139

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.732116 0.482864 9.800
log_within 0.002731 0.012678 0.215
log_between 0.081319 0.091272 0.891
sexM -0.176367 0.339429 -0.520
age -0.042893 0.010166 -4.219
ms -0.228256 0.048961 -4.662

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.026
log_between 0.373 -0.002
sexM -0.168 -0.003 -0.128
age -0.832 0.004 -0.203 -0.045
ms_dia_sgnt -0.412 0.060 -0.041 -0.027 0.049

Robustness weights for the residuals:
1730 weights are ~= 1. The remaining 525 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.212 0.522 0.702 0.691 0.880 0.999

Robustness weights for the random effects:
120 weights are ~= 1. The remaining 19 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.370 0.627 0.799 0.769 0.936 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(2248)	p
(Intercept)	4.73	0.48	[3.79, 5.68]	9.80	< .001
log within	2.73e-03	0.01	[-0.02, 0.03]	0.22	0.829
log between	0.08	0.09	[-0.10, 0.26]	0.89	0.373
sex [M]	-0.18	0.34	[-0.84, 0.49]	-0.52	0.603
age	-0.04	0.01	[-0.06, -0.02]	-4.22	< .001
ms	-0.23	0.05	[-0.32, -0.13]	-4.66	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.63
SD (Residual)	1.29

```

=====
OUTCOME: anxiety
EXPOSURE: LAN_1.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.9033 -0.5158 -0.0931  0.5626  6.1629

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 2.843    1.686
 Residual                1.641    1.281
Number of obs: 3382, groups: id, 151

Fixed effects:
              Estimate Std. Error t value
(Intercept)   4.477412   0.423718  10.567
log_within    -0.011372   0.011361  -1.001
log_between    0.064219   0.105085   0.611
sexM           -0.333446   0.324840  -1.026
age            -0.038248   0.009813  -3.898
ms             -0.206891   0.034899  -5.928

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.016
log_between 0.077 -0.003
sexM        -0.156  0.000 -0.132
age         -0.854  0.002 -0.082 -0.058
ms_dia_sgnt -0.382  0.046 -0.024 -0.020  0.062

Robustness weights for the residuals:
2600 weights are ~= 1. The remaining 782 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.218  0.522   0.704   0.691  0.871   0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 24 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.396  0.656   0.846   0.775  0.914   0.993

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3375) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.48 | 0.42 | [ 3.65, 5.31] | 10.57 | < .001
log within | -0.01 | 0.01 | [-0.03, 0.01] | -1.00 | 0.317
log between | 0.06 | 0.11 | [-0.14, 0.27] | 0.61 | 0.541
sex [M] | -0.33 | 0.32 | [-0.97, 0.30] | -1.03 | 0.305
age | -0.04 | 9.81e-03 | [-0.06, -0.02] | -3.90 | < .001
ms | -0.21 | 0.03 | [-0.28, -0.14] | -5.93 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.69
SD (Residual) | 1.28

```

```

=====
OUTCOME: anxiety
EXPOSURE: LAN_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.9053 -0.5151 -0.0934  0.5637  6.1884

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      2.752    1.659
Residual                   1.649    1.284
Number of obs: 2829, groups: id, 145

Fixed effects:
              Estimate Std. Error t value
(Intercept)   4.563596   0.445694  10.239
log_within    -0.014084   0.011690  -1.205
log_between    0.040940   0.098814   0.414
sexM           -0.278277   0.328538  -0.847
age            -0.040407   0.009923  -4.072
ms             -0.206330   0.041325  -4.993

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.018
log_between   0.240 -0.002
sexM          -0.161  0.000 -0.098
age           -0.844  0.002 -0.152 -0.056
ms_dia_sgnt  -0.397  0.044 -0.030 -0.023  0.051

Robustness weights for the residuals:
2178 weights are ~= 1. The remaining 651 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.217  0.521   0.702   0.689  0.873   0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 20 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.377  0.608   0.783   0.755  0.942   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2822) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.56 | 0.45 | [ 3.69, 5.44] | 10.24 | < .001
log within | -0.01 | 0.01 | [-0.04, 0.01] | -1.20 | 0.228
log between | 0.04 | 0.10 | [-0.15, 0.23] | 0.41 | 0.679
sex [M] | -0.28 | 0.33 | [-0.92, 0.37] | -0.85 | 0.397
age | -0.04 | 9.92e-03 | [-0.06, -0.02] | -4.07 | < .001
ms | -0.21 | 0.04 | [-0.29, -0.13] | -4.99 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.66
SD (Residual) | 1.28

```

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.8267 -0.5195 -0.0982 0.5878 6.5568

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.327 1.824
Residual 1.712 1.308
Number of obs: 4093, groups: id, 160

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.599049 0.443875 10.361
log_within -0.008527 0.011984 -0.712
log_between 0.163337 0.121365 1.346
sexM -0.366677 0.336903 -1.088
age -0.041426 0.010384 -3.990
ms -0.184840 0.029880 -6.186

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.015
log_between -0.158 -0.003
sexM -0.145 0.000 -0.108
age -0.854 0.003 0.000 -0.055
ms_dia_sgnt -0.338 0.048 -0.014 -0.019 0.063

Robustness weights for the residuals:
3161 weights are ~= 1. The remaining 932 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.205 0.544 0.712 0.701 0.892 0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.422 0.664 0.806 0.780 0.934 0.982

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4086)	p
(Intercept)	4.60	0.44	[3.73, 5.47]	10.36	< .001
log within	-8.53e-03	0.01	[-0.03, 0.01]	-0.71	0.477
log between	0.16	0.12	[-0.07, 0.40]	1.35	0.178
sex [M]	-0.37	0.34	[-1.03, 0.29]	-1.09	0.276
age	-0.04	0.01	[-0.06, -0.02]	-3.99	< .001
ms	-0.18	0.03	[-0.24, -0.13]	-6.19	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.82
SD (Residual)	1.31


```

=====
OUTCOME: anxiety
EXPOSURE: LAN_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.8588 -0.5184 -0.1014  0.5819  6.1475

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.975     1.725
Residual                   1.679     1.296
Number of obs: 3762, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.509466   0.424849  10.614
log_within     -0.008209   0.011679  -0.703
log_between     0.207829   0.107023   1.942
sexM            -0.518013   0.327875  -1.580
age            -0.038910   0.009932  -3.918
ms             -0.192384   0.032308  -5.955

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.023
log_between -0.061 -0.004
sexM        -0.139 -0.001 -0.107
age         -0.856  0.003 -0.023 -0.068
ms_dia_sgnt -0.364  0.067 -0.030 -0.014  0.061

Robustness weights for the residuals:
2898 weights are ~= 1. The remaining 864 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.219  0.545   0.721   0.702  0.882   0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 25 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.393  0.708   0.826   0.798  0.961   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3755) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.51 | 0.42 | [ 3.68, 5.34] | 10.61 | < .001
log within | -8.21e-03 | 0.01 | [-0.03, 0.01] | -0.70 | 0.482
log between | 0.21 | 0.11 | [ 0.00, 0.42] | 1.94 | 0.052
sex [M] | -0.52 | 0.33 | [-1.16, 0.12] | -1.58 | 0.114
age | -0.04 | 9.93e-03 | [-0.06, -0.02] | -3.92 | < .001
ms | -0.19 | 0.03 | [-0.26, -0.13] | -5.95 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.72
SD (Residual) | 1.30

```

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_20_21
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5624 -0.5342 -0.0956 0.5945 6.0000

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.956 1.719
Residual 1.931 1.390
Number of obs: 5092, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.546455 0.493065 7.193
log_within 0.014335 0.013450 1.066
log_between -0.026192 0.149108 -0.176
sexM -0.331557 0.307128 -1.080
age -0.032966 0.009380 -3.514
wakeupTime_dec -0.001416 0.017231 -0.082

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.003
log_between -0.563 0.000
sexM -0.075 -0.001 -0.110
age -0.760 -0.002 0.125 -0.066
wakeupTm_dc -0.341 0.017 -0.002 -0.021 0.064

Robustness weights for the residuals:
3942 weights are ~= 1. The remaining 1150 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.224 0.556 0.735 0.714 0.892 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.366 0.646 0.811 0.787 0.936 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5085)	p
(Intercept)	3.55	0.49	[2.58, 4.51]	7.19	< .001
log within	0.01	0.01	[-0.01, 0.04]	1.07	0.287
log between	-0.03	0.15	[-0.32, 0.27]	-0.18	0.861
sex [M]	-0.33	0.31	[-0.93, 0.27]	-1.08	0.280
age	-0.03	9.38e-03	[-0.05, -0.01]	-3.51	< .001
wakeupTime dec	-1.42e-03	0.02	[-0.04, 0.03]	-0.08	0.935

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.72
SD (Residual)	1.39

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_21_22
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5710 -0.5327 -0.0974 0.6015 6.0010

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.864 1.692
Residual 1.928 1.388
Number of obs: 5106, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.380180 0.448372 7.539
log_within 0.002606 0.012812 0.203
log_between 0.119921 0.126923 0.945
sexM -0.367110 0.304388 -1.206
age -0.032784 0.009232 -3.551
wakeupTime_dec -0.007364 0.017282 -0.426

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.441 -0.004
sexM -0.078 -0.001 -0.157
age -0.800 -0.001 0.118 -0.071
wakeupTm_dc -0.365 0.012 -0.027 -0.017 0.063

Robustness weights for the residuals:
3960 weights are ~= 1. The remaining 1146 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.224 0.555 0.729 0.711 0.884 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.357 0.637 0.775 0.764 0.907 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5099)	p
(Intercept)	3.38	0.45	[2.50, 4.26]	7.54	< .001
log within	2.61e-03	0.01	[-0.02, 0.03]	0.20	0.839
log between	0.12	0.13	[-0.13, 0.37]	0.94	0.345
sex [M]	-0.37	0.30	[-0.96, 0.23]	-1.21	0.228
age	-0.03	9.23e-03	[-0.05, -0.01]	-3.55	< .001
wakeupTime dec	-7.36e-03	0.02	[-0.04, 0.03]	-0.43	0.670

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.69
SD (Residual)	1.39

```

=====
OUTCOME: anxiety
EXPOSURE: LAN_22_23
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.5685 -0.5319 -0.0957  0.6084  6.0188

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.846     1.687
Residual                   1.921     1.386
Number of obs: 5101, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.450935   0.408943   8.439
log_within     -0.006983   0.010900  -0.641
log_between     0.093882   0.098349   0.955
sexM            -0.390584   0.306308  -1.275
age            -0.032622   0.009208  -3.543
wakeupTime_dec -0.003485   0.017269  -0.202

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.002
log_between -0.192 -0.001
sexM        -0.119  0.001 -0.207
age         -0.841 -0.001  0.123 -0.077
wakeupTm_dc -0.399  0.005 -0.065 -0.007  0.058

Robustness weights for the residuals:
3941 weights are ~= 1. The remaining 1160 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.223  0.555   0.728   0.713  0.894   0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 26 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.353  0.632   0.785   0.756  0.889   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5094) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.45 | 0.41 | [ 2.65, 4.25] | 8.44 | < .001
log within | -6.98e-03 | 0.01 | [-0.03, 0.01] | -0.64 | 0.522
log between | 0.09 | 0.10 | [-0.10, 0.29] | 0.95 | 0.340
sex [M] | -0.39 | 0.31 | [-0.99, 0.21] | -1.28 | 0.202
age | -0.03 | 9.21e-03 | [-0.05, -0.01] | -3.54 | < .001
wakeupTime dec | -3.49e-03 | 0.02 | [-0.04, 0.03] | -0.20 | 0.840

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.69
SD (Residual) | 1.39

```

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_23_0
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5006 -0.5313 -0.0964 0.5974 6.0471

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.932 1.712
Residual 1.918 1.385
Number of obs: 5096, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.514054 0.407377 8.626
log_within -0.010913 0.010088 -1.082
log_between 0.068818 0.084739 0.812
sexM -0.397892 0.314285 -1.266
age -0.032112 0.009326 -3.443
wakeupTime_dec -0.001909 0.017315 -0.110

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between 0.080 0.002
sexM -0.181 0.000 -0.254
age -0.824 -0.004 0.110 -0.079
wakeupTm_dc -0.420 -0.036 -0.097 0.004 0.054

Robustness weights for the residuals:
3932 weights are ~= 1. The remaining 1164 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.222 0.555 0.738 0.715 0.902 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 26 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.363 0.650 0.815 0.772 0.906 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5089)	p
(Intercept)	3.51	0.41	[2.72, 4.31]	8.63	< .001
log within	-0.01	0.01	[-0.03, 0.01]	-1.08	0.279
log between	0.07	0.08	[-0.10, 0.23]	0.81	0.417
sex [M]	-0.40	0.31	[-1.01, 0.22]	-1.27	0.206
age	-0.03	9.33e-03	[-0.05, -0.01]	-3.44	< .001
wakeupTime dec	-1.91e-03	0.02	[-0.04, 0.03]	-0.11	0.912

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.71
SD (Residual)	1.38

```

=====
OUTCOME: anxiety
EXPOSURE: LAN_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.8119 -0.5230 -0.1000  0.5969  6.4502

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    3.165     1.779
Residual                   1.778     1.334
Number of obs: 4262, groups: id, 164

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.634218   0.432420  10.717
log_within     -0.012579   0.012970  -0.970
log_between     0.087525   0.120393   0.727
sexM            -0.296776   0.325679  -0.911
age            -0.040439   0.009942  -4.068
ms             -0.208071   0.028703  -7.249

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.024
log_between -0.225 -0.004
sexM        -0.123  0.000 -0.098
age         -0.841  0.004  0.006 -0.073
ms_dia_sgnt -0.343  0.072 -0.024 -0.021  0.068

Robustness weights for the residuals:
3300 weights are ~= 1. The remaining 962 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.209  0.540   0.721   0.702  0.883   0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.411  0.668   0.798   0.784  0.945   0.993

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4255) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.63 | 0.43 | [ 3.79, 5.48] | 10.72 | < .001
log within | -0.01 | 0.01 | [-0.04, 0.01] | -0.97 | 0.332
log between | 0.09 | 0.12 | [-0.15, 0.32] | 0.73 | 0.467
sex [M] | -0.30 | 0.33 | [-0.94, 0.34] | -0.91 | 0.362
age | -0.04 | 9.94e-03 | [-0.06, -0.02] | -4.07 | < .001
ms | -0.21 | 0.03 | [-0.26, -0.15] | -7.25 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.78
SD (Residual) | 1.33

```

```

=====
OUTCOME: anxiety
EXPOSURE: LAN_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.6727 -0.5382 -0.0951  0.6116  6.1475

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.972    1.724
Residual                   1.824    1.350
Number of obs: 4809, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.277230   0.474875   9.007
log_within     0.032860   0.018632   1.764
log_between    0.025087   0.147980   0.170
sexM           -0.194663   0.309569  -0.629
age            -0.037967   0.009555  -3.973
ms             -0.148254   0.022443  -6.606

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.002
log_between  -0.549 -0.001
sexM          -0.102  0.001 -0.053
age          -0.782 -0.001  0.108 -0.075
ms_dia_sgnt -0.261  0.000 -0.020 -0.034  0.073

Robustness weights for the residuals:
3717 weights are ~= 1. The remaining 1092 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.219  0.556   0.733   0.711  0.887   0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 26 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.407  0.620   0.768   0.764  0.954   0.995

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4802) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.28 | 0.47 | [ 3.35, 5.21] | 9.01 | < .001
log within | 0.03 | 0.02 | [ 0.00, 0.07] | 1.76 | 0.078
log between | 0.03 | 0.15 | [-0.27, 0.32] | 0.17 | 0.865
sex [M] | -0.19 | 0.31 | [-0.80, 0.41] | -0.63 | 0.529
age | -0.04 | 9.56e-03 | [-0.06, -0.02] | -3.97 | < .001
ms | -0.15 | 0.02 | [-0.19, -0.10] | -6.61 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.72
SD (Residual) | 1.35

```

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_sunset_20
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5890 -0.5473 -0.0920 0.5978 5.9678

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.942 1.715
Residual 1.922 1.386
Number of obs: 5099, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.610715 0.514136 7.023
log_within 0.050194 0.014888 3.371
log_between -0.086204 0.164345 -0.525
sexM -0.331350 0.304562 -1.088
age -0.033452 0.009320 -3.589
wakeupTime_dec 0.005186 0.017258 0.300

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.012
log_between -0.612 0.000
sexM -0.138 -0.001 0.010
age -0.716 0.002 0.087 -0.052
wakeupTm_dc -0.335 0.037 0.010 -0.021 0.066

Robustness weights for the residuals:
3954 weights are ~= 1. The remaining 1145 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.225 0.556 0.728 0.712 0.894 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.368 0.671 0.851 0.803 0.974 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5092)	p
(Intercept)	3.61	0.51	[2.60, 4.62]	7.02	< .001
log within	0.05	0.01	[0.02, 0.08]	3.37	< .001
log between	-0.09	0.16	[-0.41, 0.24]	-0.52	0.600
sex [M]	-0.33	0.30	[-0.93, 0.27]	-1.09	0.277
age	-0.03	9.32e-03	[-0.05, -0.02]	-3.59	< .001
wakeupTime dec	5.19e-03	0.02	[-0.03, 0.04]	0.30	0.764

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.72
SD (Residual)	1.39


```
=====
OUTCOME: anxiety
EXPOSURE: LAN_0_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6652 -0.5456 -0.0944 0.5982 6.1831

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.017 1.737
Residual 1.953 1.397
Number of obs: 5657, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.380885 0.427175 12.596
log_within -0.004123 0.010363 -0.398
log_between 0.185992 0.090839 2.047
sexM -0.423130 0.308675 -1.371
age -0.036280 0.009368 -3.873
wakeupTime_dec -0.160119 0.016660 -9.611

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.078
log_between 0.316 0.020
sexM -0.219 0.000 -0.169
age -0.763 -0.009 0.110 -0.060
wakeupTm_dc -0.412 -0.189 -0.108 0.002 0.050

Robustness weights for the residuals:
4390 weights are ~= 1. The remaining 1267 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.559 0.733 0.713 0.889 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.346 0.639 0.835 0.781 0.939 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5650)	p
(Intercept)	5.38	0.43	[4.54, 6.22]	12.60	< .001
log within	-4.12e-03	0.01	[-0.02, 0.02]	-0.40	0.691
log between	0.19	0.09	[0.01, 0.36]	2.05	0.041
sex [M]	-0.42	0.31	[-1.03, 0.18]	-1.37	0.170
age	-0.04	9.37e-03	[-0.05, -0.02]	-3.87	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.13]	-9.61	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.40

```

=====
OUTCOME: anxiety
EXPOSURE: LAN_1_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.6560 -0.5530 -0.0965  0.5978  6.1918

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    3.044     1.745
Residual                   1.956     1.398
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.519198   0.472113  11.690
log_within     -0.007199   0.013096  -0.550
log_between     0.199917   0.106146   1.883
sexM            -0.386028   0.307064  -1.257
age            -0.036235   0.009419  -3.847
wakeupTime_dec -0.153303   0.016589  -9.241

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.063
log_between   0.508  0.015
sexM          -0.202  0.001 -0.099
age           -0.663 -0.008  0.119 -0.054
wakeupTm_dc  -0.389 -0.160 -0.096 -0.008  0.049

Robustness weights for the residuals:
4390 weights are ~= 1. The remaining 1271 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.217  0.559   0.735   0.714  0.888   0.999

Robustness weights for the random effects:
146 weights are ~= 1. The remaining 26 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.350  0.611   0.814   0.775  0.944   0.983

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.52 | 0.47 | [ 4.59, 6.44] | 11.69 | < .001
log within | -7.20e-03 | 0.01 | [-0.03, 0.02] | -0.55 | 0.583
log between | 0.20 | 0.11 | [-0.01, 0.41] | 1.88 | 0.060
sex [M] | -0.39 | 0.31 | [-0.99, 0.22] | -1.26 | 0.209
age | -0.04 | 9.42e-03 | [-0.05, -0.02] | -3.85 | < .001
wakeupTime dec | -0.15 | 0.02 | [-0.19, -0.12] | -9.24 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.74
SD (Residual) | 1.40

```

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_2_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5793 -0.5479 -0.0953 0.6000 6.1279

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.130 1.769
Residual 1.975 1.405
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.607405 0.531287 10.554
log_within -0.028990 0.016968 -1.708
log_between 0.191038 0.124581 1.533
sexM -0.338721 0.309793 -1.093
age -0.037224 0.009521 -3.910
wakeupTime_dec -0.152726 0.016756 -9.115

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.066
log_between 0.631 0.016
sexM -0.133 0.003 0.007
age -0.596 -0.010 0.091 -0.041
wakeupTm_dc -0.361 -0.184 -0.087 -0.018 0.052

Robustness weights for the residuals:
4395 weights are ~= 1. The remaining 1266 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.556 0.732 0.713 0.890 0.999

Robustness weights for the random effects:
145 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.360 0.653 0.849 0.794 0.942 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	5.61	0.53	[4.57, 6.65]	10.55	< .001
log within	-0.03	0.02	[-0.06, 0.00]	-1.71	0.088
log between	0.19	0.12	[-0.05, 0.44]	1.53	0.125
sex [M]	-0.34	0.31	[-0.95, 0.27]	-1.09	0.274
age	-0.04	9.52e-03	[-0.06, -0.02]	-3.91	< .001
wakeupTime dec	-0.15	0.02	[-0.19, -0.12]	-9.11	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.77
SD (Residual)	1.41

```

=====
OUTCOME: anxiety
EXPOSURE: LAN_3_4
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.6436 -0.5480 -0.0945  0.5983  6.1378

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    3.179     1.783
Residual                   1.968     1.403
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.03800   0.66054   9.141
log_within     -0.02216   0.02056  -1.078
log_between     0.31379   0.17011   1.845
sexM            -0.28380   0.31304  -0.907
age            -0.03760   0.00957  -3.928
wakeupTime_dec -0.15128   0.01675  -9.029

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.047
log_between    0.778  0.010
sexM          -0.051  0.003  0.077
age           -0.484 -0.009  0.060 -0.038
wakeupTm_dc -0.297 -0.159 -0.064 -0.022  0.057

Robustness weights for the residuals:
4392 weights are ~= 1. The remaining 1269 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.219  0.555   0.733   0.713  0.890   0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 28 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.365  0.690   0.838   0.808  0.951   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.04 | 0.66 | [ 4.74, 7.33] | 9.14 | < .001
log within | -0.02 | 0.02 | [-0.06, 0.02] | -1.08 | 0.281
log between | 0.31 | 0.17 | [-0.02, 0.65] | 1.84 | 0.065
sex [M] | -0.28 | 0.31 | [-0.90, 0.33] | -0.91 | 0.365
age | -0.04 | 9.57e-03 | [-0.06, -0.02] | -3.93 | < .001
wakeupTime dec | -0.15 | 0.02 | [-0.18, -0.12] | -9.03 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.78
SD (Residual) | 1.40

```

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_4_5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6461 -0.5503 -0.0929 0.5985 6.1276

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.150 1.775
Residual 1.976 1.406
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.106834 0.757780 8.059
log_within -0.008934 0.025295 -0.353
log_between 0.299854 0.194030 1.545
sexM -0.253923 0.314139 -0.808
age -0.038902 0.009514 -4.089
wakeupTime_dec -0.156006 0.016606 -9.394

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.024
log_between 0.839 0.003
sexM 0.028 0.002 0.147
age -0.482 -0.006 -0.024 -0.046
wakeupTm_dc -0.243 -0.100 -0.034 -0.022 0.062

Robustness weights for the residuals:
4392 weights are ~= 1. The remaining 1269 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.555 0.734 0.714 0.889 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.366 0.671 0.848 0.805 0.962 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	6.11	0.76	[4.62, 7.59]	8.06	< .001
log within	-8.93e-03	0.03	[-0.06, 0.04]	-0.35	0.724
log between	0.30	0.19	[-0.08, 0.68]	1.55	0.122
sex [M]	-0.25	0.31	[-0.87, 0.36]	-0.81	0.419
age	-0.04	9.51e-03	[-0.06, -0.02]	-4.09	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.12]	-9.39	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.77
SD (Residual)	1.41

```
=====
OUTCOME: anxiety
EXPOSURE: LAN_5_sunrise
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6529 -0.5458 -0.0961 0.5994 6.1599

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.135 1.771
Residual 1.960 1.400
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.375337 0.901195 5.965
log_within -0.028171 0.028333 -0.994
log_between 0.075742 0.241234 0.314
sexM -0.315123 0.318766 -0.989
age -0.038873 0.009554 -4.069
wakeupTime_dec -0.155773 0.016432 -9.480

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between 0.890 0.000
sexM 0.129 0.000 0.234
age -0.488 -0.001 -0.117 -0.069
wakeupTm_dc -0.160 -0.008 0.021 -0.012 0.058

Robustness weights for the residuals:
4397 weights are ~= 1. The remaining 1264 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.554 0.732 0.712 0.887 0.999

Robustness weights for the random effects:
145 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.367 0.615 0.820 0.782 0.960 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	5.38	0.90	[3.61, 7.14]	5.96	< .001
log within	-0.03	0.03	[-0.08, 0.03]	-0.99	0.320
log between	0.08	0.24	[-0.40, 0.55]	0.31	0.754
sex [M]	-0.32	0.32	[-0.94, 0.31]	-0.99	0.323
age	-0.04	9.55e-03	[-0.06, -0.02]	-4.07	< .001
wakeupTime dec	-0.16	0.02	[-0.19, -0.12]	-9.48	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.77
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.2397 -0.5378 -0.1011 0.6146 6.1360

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.00 1.732
Residual 1.95 1.396
Number of obs: 4982, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.314831 0.407373 10.592
log_within -0.001212 0.008419 -0.144
log_between 0.111068 0.083455 1.331
sexM -0.279781 0.305359 -0.916
age -0.038176 0.009548 -3.998
ms -0.141548 0.022734 -6.226

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.031
log_between -0.225 0.001
sexM -0.162 0.003 -0.027
age -0.866 -0.006 0.124 -0.054
ms -0.323 -0.100 -0.011 -0.031 0.068

Robustness weights for the residuals:
3881 weights are ~= 1. The remaining 1101 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.553 0.734 0.711 0.881 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.352 0.609 0.886 0.792 0.959 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4975)	p
(Intercept)	4.31	0.41	[3.52, 5.11]	10.59	< .001
log within	-1.21e-03	8.42e-03	[-0.02, 0.02]	-0.14	0.886
log between	0.11	0.08	[-0.05, 0.27]	1.33	0.183
sex [M]	-0.28	0.31	[-0.88, 0.32]	-0.92	0.360
age	-0.04	9.55e-03	[-0.06, -0.02]	-4.00	< .001
ms	-0.14	0.02	[-0.19, -0.10]	-6.23	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.73
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4727 -0.5372 -0.1056 0.6050 6.1407

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.064 1.751
Residual 1.969 1.403
Number of obs: 4975, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.484128 0.479233 9.357
log_within -0.016723 0.009550 -1.751
log_between -0.027504 0.094919 -0.290
sexM -0.272071 0.308423 -0.882
age -0.039673 0.009635 -4.117
ms -0.137187 0.022767 -6.026

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.549 -0.001
sexM -0.141 0.002 -0.007
age -0.783 -0.004 0.114 -0.052
ms -0.281 -0.064 0.006 -0.031 0.069

Robustness weights for the residuals:
3884 weights are ~= 1. The remaining 1091 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.554 0.733 0.709 0.875 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.367 0.615 0.805 0.775 0.945 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4968)	p
(Intercept)	4.48	0.48	[3.54, 5.42]	9.36	< .001
log within	-0.02	9.55e-03	[-0.04, 0.00]	-1.75	0.080
log between	-0.03	0.09	[-0.21, 0.16]	-0.29	0.772
sex [M]	-0.27	0.31	[-0.88, 0.33]	-0.88	0.378
age	-0.04	9.64e-03	[-0.06, -0.02]	-4.12	< .001
ms	-0.14	0.02	[-0.18, -0.09]	-6.03	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.75
SD (Residual)	1.40


```
=====
OUTCOME: anxiety
EXPOSURE: LaW_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4669 -0.5348 -0.1042 0.6073 6.1191

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.068 1.752
Residual 1.972 1.404
Number of obs: 4980, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.422751 0.445134 9.936
log_within -0.007416 0.008861 -0.837
log_between 0.008421 0.087028 0.097
sexM -0.265141 0.308640 -0.859
age -0.039447 0.009683 -4.074
ms -0.143385 0.022857 -6.273

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.027
log_between -0.433 0.000
sexM -0.155 0.003 -0.002
age -0.837 -0.006 0.146 -0.051
ms -0.300 -0.094 -0.001 -0.031 0.069

Robustness weights for the residuals:
3885 weights are ~= 1. The remaining 1095 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.220 0.553 0.736 0.711 0.879 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.367 0.604 0.800 0.772 0.938 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4973)	p
(Intercept)	4.42	0.45	[3.55, 5.30]	9.94	< .001
log within	-7.42e-03	8.86e-03	[-0.02, 0.01]	-0.84	0.403
log between	8.42e-03	0.09	[-0.16, 0.18]	0.10	0.923
sex [M]	-0.27	0.31	[-0.87, 0.34]	-0.86	0.390
age	-0.04	9.68e-03	[-0.06, -0.02]	-4.07	< .001
ms	-0.14	0.02	[-0.19, -0.10]	-6.27	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.75
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5395 -0.5388 -0.1087 0.6048 6.1312

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.047 1.745
Residual 1.971 1.404
Number of obs: 4954, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.697498 0.548142 8.570
log_within -0.015449 0.011235 -1.375
log_between -0.080454 0.110680 -0.727
sexM -0.267040 0.307652 -0.868
age -0.040042 0.009573 -4.183
ms -0.138052 0.023131 -5.968

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.016
log_between -0.683 -0.001
sexM -0.113 0.002 -0.018
age -0.681 -0.004 0.072 -0.052
ms -0.254 -0.064 0.014 -0.032 0.070

Robustness weights for the residuals:
3866 weights are ~= 1. The remaining 1088 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.554 0.735 0.710 0.876 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.363 0.627 0.831 0.783 0.951 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4947)	p
(Intercept)	4.70	0.55	[3.62, 5.77]	8.57	< .001
log within	-0.02	0.01	[-0.04, 0.01]	-1.38	0.169
log between	-0.08	0.11	[-0.30, 0.14]	-0.73	0.467
sex [M]	-0.27	0.31	[-0.87, 0.34]	-0.87	0.385
age	-0.04	9.57e-03	[-0.06, -0.02]	-4.18	< .001
ms	-0.14	0.02	[-0.18, -0.09]	-5.97	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.75
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4761 -0.5386 -0.1078 0.5997 6.1287

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.039 1.743
Residual 1.974 1.405
Number of obs: 4961, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.606135 0.506605 9.092
log_within -0.018136 0.010292 -1.762
log_between -0.063447 0.099388 -0.638
sexM -0.267010 0.307302 -0.869
age -0.040204 0.009582 -4.196
ms -0.134779 0.022963 -5.869

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.015
log_between -0.615 -0.001
sexM -0.121 0.002 -0.025
age -0.742 -0.003 0.100 -0.053
ms -0.271 -0.058 0.012 -0.032 0.070

Robustness weights for the residuals:
3872 weights are ~= 1. The remaining 1089 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.555 0.734 0.709 0.873 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.366 0.616 0.805 0.776 0.955 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4954)	p
(Intercept)	4.61	0.51	[3.61, 5.60]	9.09	< .001
log within	-0.02	0.01	[-0.04, 0.00]	-1.76	0.078
log between	-0.06	0.10	[-0.26, 0.13]	-0.64	0.523
sex [M]	-0.27	0.31	[-0.87, 0.34]	-0.87	0.385
age	-0.04	9.58e-03	[-0.06, -0.02]	-4.20	< .001
ms	-0.13	0.02	[-0.18, -0.09]	-5.87	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_3.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5482 -0.5359 -0.1069 0.6106 6.1254

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.023 1.739
Residual 1.968 1.403
Number of obs: 4934, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.910788 0.596999 8.226
log_within -0.010482 0.013212 -0.793
log_between -0.108862 0.121945 -0.893
sexM -0.255976 0.306650 -0.835
age -0.040263 0.009516 -4.231
ms -0.154422 0.023618 -6.538

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.013
log_between -0.743 -0.002
sexM -0.088 0.002 -0.036
age -0.600 -0.003 0.027 -0.052
ms -0.248 -0.053 0.026 -0.033 0.070

Robustness weights for the residuals:
3845 weights are ~= 1. The remaining 1089 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.220 0.555 0.737 0.712 0.883 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.361 0.628 0.816 0.777 0.939 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4927)	p
(Intercept)	4.91	0.60	[3.74, 6.08]	8.23	< .001
log within	-0.01	0.01	[-0.04, 0.02]	-0.79	0.428
log between	-0.11	0.12	[-0.35, 0.13]	-0.89	0.372
sex [M]	-0.26	0.31	[-0.86, 0.35]	-0.83	0.404
age	-0.04	9.52e-03	[-0.06, -0.02]	-4.23	< .001
ms	-0.15	0.02	[-0.20, -0.11]	-6.54	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6079 -0.5338 -0.1065 0.6085 6.1291

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.023 1.739
Residual 1.964 1.401
Number of obs: 4946, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.789134 0.572032 8.372
log_within -0.009759 0.012178 -0.801
log_between -0.096577 0.115845 -0.834
sexM -0.263183 0.306613 -0.858
age -0.040134 0.009526 -4.213
ms -0.141517 0.023196 -6.101

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.015
log_between -0.717 -0.001
sexM -0.098 0.002 -0.031
age -0.641 -0.003 0.053 -0.052
ms -0.248 -0.061 0.019 -0.033 0.070

Robustness weights for the residuals:
3858 weights are ~= 1. The remaining 1088 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.554 0.736 0.711 0.881 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.357 0.628 0.825 0.779 0.948 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4939)	p
(Intercept)	4.79	0.57	[3.67, 5.91]	8.37	< .001
log within	-9.76e-03	0.01	[-0.03, 0.01]	-0.80	0.423
log between	-0.10	0.12	[-0.32, 0.13]	-0.83	0.405
sex [M]	-0.26	0.31	[-0.86, 0.34]	-0.86	0.391
age	-0.04	9.53e-03	[-0.06, -0.02]	-4.21	< .001
ms	-0.14	0.02	[-0.19, -0.10]	-6.10	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_4.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5452 -0.5269 -0.1068 0.6169 6.1511

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.004 1.733
Residual 1.954 1.398
Number of obs: 4877, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.031733 0.637254 7.896
log_within -0.020409 0.014853 -1.374
log_between -0.132852 0.132424 -1.003
sexM -0.271828 0.305768 -0.889
age -0.039948 0.009489 -4.210
ms -0.156931 0.024494 -6.407

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.010
log_between -0.779 -0.001
sexM -0.090 0.001 -0.022
age -0.519 -0.002 -0.029 -0.050
ms -0.245 -0.040 0.035 -0.037 0.068

Robustness weights for the residuals:
3798 weights are ~= 1. The remaining 1079 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.554 0.738 0.711 0.883 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.361 0.659 0.822 0.783 0.933 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4870)	p
(Intercept)	5.03	0.64	[3.78, 6.28]	7.90	< .001
log within	-0.02	0.01	[-0.05, 0.01]	-1.37	0.170
log between	-0.13	0.13	[-0.39, 0.13]	-1.00	0.316
sex [M]	-0.27	0.31	[-0.87, 0.33]	-0.89	0.374
age	-0.04	9.49e-03	[-0.06, -0.02]	-4.21	< .001
ms	-0.16	0.02	[-0.20, -0.11]	-6.41	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.73
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6091 -0.5310 -0.1065 0.6139 6.1585

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.013 1.736
Residual 1.950 1.396
Number of obs: 4906, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.970925 0.620837 8.007
log_within -0.016108 0.014100 -1.142
log_between -0.115552 0.127880 -0.904
sexM -0.256753 0.306176 -0.839
age -0.040146 0.009498 -4.227
ms -0.160134 0.024004 -6.671

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.012
log_between -0.766 -0.001
sexM -0.091 0.002 -0.025
age -0.558 -0.003 0.002 -0.051
ms -0.242 -0.049 0.029 -0.036 0.068

Robustness weights for the residuals:
3814 weights are ~= 1. The remaining 1092 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.555 0.741 0.713 0.889 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.357 0.650 0.791 0.775 0.928 0.992

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4899)	p
(Intercept)	4.97	0.62	[3.75, 6.19]	8.01	< .001
log within	-0.02	0.01	[-0.04, 0.01]	-1.14	0.253
log between	-0.12	0.13	[-0.37, 0.14]	-0.90	0.366
sex [M]	-0.26	0.31	[-0.86, 0.34]	-0.84	0.402
age	-0.04	9.50e-03	[-0.06, -0.02]	-4.23	< .001
ms	-0.16	0.02	[-0.21, -0.11]	-6.67	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.40

=====
OUTCOME: anxiety
EXPOSURE: LaW_5.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5163 -0.5290 -0.1062 0.6164 6.1610

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.013 1.736
Residual 1.947 1.395
Number of obs: 4761, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.312146 0.679631 7.816
log_within -0.021277 0.016644 -1.278
log_between -0.201847 0.141330 -1.428
sexM -0.271334 0.306692 -0.885
age -0.039433 0.009519 -4.143
ms -0.158133 0.026035 -6.074

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between -0.805 0.000
sexM -0.102 0.000 0.002
age -0.478 0.000 -0.039 -0.050
ms -0.247 -0.006 0.043 -0.036 0.066

Robustness weights for the residuals:
3711 weights are ~= 1. The remaining 1050 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.218 0.550 0.735 0.710 0.881 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.370 0.669 0.784 0.773 0.895 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4754) | p
(Intercept) | 5.31 | 0.68 | [3.98, 6.64] | 7.82 | < .001
log within | -0.02 | 0.02 | [-0.05, 0.01] | -1.28 | 0.201
log between | -0.20 | 0.14 | [-0.48, 0.08] | -1.43 | 0.153
sex [M] | -0.27 | 0.31 | [-0.87, 0.33] | -0.88 | 0.376
age | -0.04 | 9.52e-03 | [-0.06, -0.02] | -4.14 | < .001
ms | -0.16 | 0.03 | [-0.21, -0.11] | -6.07 | < .001

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 1.74
SD (Residual) | 1.40


```
=====
OUTCOME: anxiety
EXPOSURE: LaW_5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4938 -0.5306 -0.1057 0.6168 6.1396

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.985 1.728
Residual 1.962 1.401
Number of obs: 4823, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.211639 0.651179 8.003
log_within -0.022955 0.015889 -1.445
log_between -0.175741 0.135455 -1.297
sexM -0.272952 0.304911 -0.895
age -0.039723 0.009469 -4.195
ms -0.159363 0.025248 -6.312

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.005
log_between -0.789 -0.001
sexM -0.089 0.001 -0.019
age -0.494 -0.001 -0.043 -0.050
ms -0.249 -0.022 0.038 -0.037 0.068

Robustness weights for the residuals:
3757 weights are ~= 1. The remaining 1066 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.552 0.735 0.711 0.880 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.365 0.667 0.811 0.779 0.906 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4816)	p
(Intercept)	5.21	0.65	[3.94, 6.49]	8.00	< .001
log within	-0.02	0.02	[-0.05, 0.01]	-1.44	0.149
log between	-0.18	0.14	[-0.44, 0.09]	-1.30	0.195
sex [M]	-0.27	0.30	[-0.87, 0.32]	-0.90	0.371
age	-0.04	9.47e-03	[-0.06, -0.02]	-4.19	< .001
ms	-0.16	0.03	[-0.21, -0.11]	-6.31	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.73
SD (Residual)	1.40

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_6.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5762 -0.5269 -0.1100 0.6015 6.2497

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.070 1.752
Residual 1.896 1.377
Number of obs: 4580, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.506306 0.669704 8.222
log_within -0.015274 0.018406 -0.830
log_between -0.238572 0.135408 -1.762
sexM -0.294794 0.310150 -0.950
age -0.039127 0.009613 -4.070
ms -0.168204 0.028000 -6.007

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.007
log_between -0.792 0.001
sexM -0.131 -0.001 0.037
age -0.481 0.002 -0.051 -0.052
ms -0.257 0.027 0.040 -0.036 0.061

Robustness weights for the residuals:
3576 weights are ~= 1. The remaining 1004 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.215 0.542 0.724 0.702 0.874 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.376 0.703 0.811 0.788 0.929 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4573)	p
(Intercept)	5.51	0.67	[4.19, 6.82]	8.22	< .001
log within	-0.02	0.02	[-0.05, 0.02]	-0.83	0.407
log between	-0.24	0.14	[-0.50, 0.03]	-1.76	0.078
sex [M]	-0.29	0.31	[-0.90, 0.31]	-0.95	0.342
age	-0.04	9.61e-03	[-0.06, -0.02]	-4.07	< .001
ms	-0.17	0.03	[-0.22, -0.11]	-6.01	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.75
SD (Residual)	1.38

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_6
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5373 -0.5254 -0.1073 0.6147 6.2001

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.019 1.738
Residual 1.926 1.388
Number of obs: 4678, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.348336 0.660555 8.097
log_within -0.023400 0.017444 -1.341
log_between -0.204126 0.133879 -1.525
sexM -0.273423 0.307360 -0.890
age -0.039606 0.009532 -4.155
ms -0.163088 0.027001 -6.040

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.791 0.000
sexM -0.117 0.000 0.018
age -0.491 0.000 -0.043 -0.051
ms -0.258 0.002 0.044 -0.036 0.064

Robustness weights for the residuals:
3647 weights are ~= 1. The remaining 1031 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.217 0.547 0.730 0.707 0.878 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.370 0.691 0.828 0.786 0.930 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4671)	p
(Intercept)	5.35	0.66	[4.05, 6.64]	8.10	< .001
log within	-0.02	0.02	[-0.06, 0.01]	-1.34	0.180
log between	-0.20	0.13	[-0.47, 0.06]	-1.52	0.127
sex [M]	-0.27	0.31	[-0.88, 0.33]	-0.89	0.374
age	-0.04	9.53e-03	[-0.06, -0.02]	-4.15	< .001
ms	-0.16	0.03	[-0.22, -0.11]	-6.04	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.39

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_7.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.3832 -0.5245 -0.1129 0.5879 6.2887

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.121 1.767
Residual 1.879 1.371
Number of obs: 4197, groups: id, 170

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.667512 0.696919 8.132
log_within -0.007226 0.020343 -0.355
log_between -0.256032 0.140174 -1.827
sexM -0.238930 0.314887 -0.759
age -0.039420 0.009720 -4.055
ms -0.190917 0.031832 -5.998

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.008
log_between -0.800 0.001
sexM -0.123 -0.001 0.032
age -0.474 0.002 -0.043 -0.053
ms -0.264 0.030 0.039 -0.038 0.056

Robustness weights for the residuals:
3266 weights are ~= 1. The remaining 931 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.214 0.544 0.719 0.704 0.882 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.390 0.718 0.838 0.803 0.935 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4190)	p
(Intercept)	5.67	0.70	[4.30, 7.03]	8.13	< .001
log within	-7.23e-03	0.02	[-0.05, 0.03]	-0.36	0.722
log between	-0.26	0.14	[-0.53, 0.02]	-1.83	0.068
sex [M]	-0.24	0.31	[-0.86, 0.38]	-0.76	0.448
age	-0.04	9.72e-03	[-0.06, -0.02]	-4.06	< .001
ms	-0.19	0.03	[-0.25, -0.13]	-6.00	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.77
SD (Residual)	1.37

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_7
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5016 -0.5295 -0.1101 0.5943 6.2597

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.085 1.756
Residual 1.894 1.376
Number of obs: 4426, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.544992 0.680736 8.146
log_within -0.011424 0.019423 -0.588
log_between -0.226758 0.136778 -1.658
sexM -0.270435 0.312189 -0.866
age -0.039564 0.009651 -4.099
ms -0.183541 0.029563 -6.208

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.007
log_between -0.796 0.001
sexM -0.130 -0.001 0.038
age -0.479 0.002 -0.046 -0.053
ms -0.257 0.024 0.037 -0.035 0.057

Robustness weights for the residuals:
3454 weights are ~= 1. The remaining 972 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.215 0.542 0.719 0.700 0.869 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.382 0.702 0.809 0.785 0.920 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4419)	p
(Intercept)	5.54	0.68	[4.21, 6.88]	8.15	< .001
log within	-0.01	0.02	[-0.05, 0.03]	-0.59	0.556
log between	-0.23	0.14	[-0.49, 0.04]	-1.66	0.097
sex [M]	-0.27	0.31	[-0.88, 0.34]	-0.87	0.386
age	-0.04	9.65e-03	[-0.06, -0.02]	-4.10	< .001
ms	-0.18	0.03	[-0.24, -0.13]	-6.21	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.76
SD (Residual)	1.38

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4924 -0.5175 -0.1122 0.5998 6.2387

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.031 1.741
Residual 1.889 1.374
Number of obs: 3836, groups: id, 166

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.6788990 0.6834087 8.310
log_within 0.0003442 0.0219818 0.016
log_between -0.3199562 0.1364828 -2.344
sexM -0.2591550 0.3157757 -0.821
age -0.0389398 0.0096453 -4.037
ms -0.1424274 0.0355590 -4.005

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.013
log_between -0.788 0.002
sexM -0.130 -0.002 0.047
age -0.478 0.003 -0.048 -0.065
ms -0.286 0.044 0.038 -0.033 0.054

Robustness weights for the residuals:
2986 weights are ~= 1. The remaining 850 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.216 0.550 0.731 0.707 0.884 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 25 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.378 0.694 0.768 0.767 0.905 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3829)	p
(Intercept)	5.68	0.68	[4.34, 7.02]	8.31	< .001
log within	3.44e-04	0.02	[-0.04, 0.04]	0.02	0.988
log between	-0.32	0.14	[-0.59, -0.05]	-2.34	0.019
sex [M]	-0.26	0.32	[-0.88, 0.36]	-0.82	0.412
age	-0.04	9.65e-03	[-0.06, -0.02]	-4.04	< .001
ms	-0.14	0.04	[-0.21, -0.07]	-4.01	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.74
SD (Residual)	1.37

```
=====
OUTCOME: anxiety
EXPOSURE: LaW_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.8554 -0.5292 -0.0963 0.5910 6.3080

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 3.284 1.812
Residual 1.853 1.361
Number of obs: 4069, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.313668 0.703982 7.548
log_within -0.024019 0.022527 -1.066
log_between -0.251055 0.143323 -1.752
sexM -0.424651 0.324700 -1.308
age -0.037261 0.009863 -3.778
ms -0.110437 0.032701 -3.377

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.005
log_between -0.797 0.000
sexM -0.110 0.001 0.009
age -0.505 -0.001 -0.015 -0.049
ms -0.239 -0.023 0.027 -0.036 0.055

Robustness weights for the residuals:
3137 weights are ~= 1. The remaining 932 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.546 0.730 0.710 0.893 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.379 0.727 0.843 0.802 0.932 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4062)	p
(Intercept)	5.31	0.70	[3.93, 6.69]	7.55	< .001
log within	-0.02	0.02	[-0.07, 0.02]	-1.07	0.286
log between	-0.25	0.14	[-0.53, 0.03]	-1.75	0.080
sex [M]	-0.42	0.32	[-1.06, 0.21]	-1.31	0.191
age	-0.04	9.86e-03	[-0.06, -0.02]	-3.78	< .001
ms	-0.11	0.03	[-0.17, -0.05]	-3.38	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.81
SD (Residual)	1.36

```
=====
OUTCOME: appetite
EXPOSURE: DAY_10_11
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
      Min       1Q   Median       3Q      Max
-6.3126 -0.6115  0.0028  0.6086  6.1379
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.3235   1.1504
Residual                0.8062   0.8979
Number of obs: 5660, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.272999   0.284228  15.034
log_within      0.012587   0.006072   2.073
log_between    -0.044130   0.046188  -0.955
sexM            0.286315   0.201770   1.419
age            -0.004515   0.006436  -0.702
wakeupTime_dec -0.027689   0.011416  -2.425
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.168
log_between -0.316  0.049
sexM        -0.188 -0.004  0.069
age         -0.675  0.010 -0.288 -0.061
wakeupTm_dc -0.427  0.392  0.125 -0.009  0.025
```

```
Robustness weights for the residuals:
4422 weights are ~= 1. The remaining 1238 ones are summarized as
      Min. 1st Qu.  Median      Mean 3rd Qu.      Max.
 0.213   0.607   0.776   0.751   0.925   0.999
```

```
Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
      Min. 1st Qu.  Median      Mean 3rd Qu.      Max.
 0.400   0.642   0.821   0.787   0.931   0.992
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	4.27	0.28	[3.72, 4.83]	15.03	< .001
log within	0.01	6.07e-03	[0.00, 0.02]	2.07	0.038
log between	-0.04	0.05	[-0.13, 0.05]	-0.96	0.339
sex [M]	0.29	0.20	[-0.11, 0.68]	1.42	0.156
age	-4.51e-03	6.44e-03	[-0.02, 0.01]	-0.70	0.483
wakeupTime dec	-0.03	0.01	[-0.05, -0.01]	-2.43	0.015

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.15
SD (Residual)	0.90

=====
OUTCOME: appetite
EXPOSURE: DAY_11_12
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3150 -0.6085 0.0029 0.6090 6.1395

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3226 1.1501
Residual 0.8067 0.8982
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.406813 0.314580 14.009
log_within 0.006766 0.006732 1.005
log_between -0.055012 0.054524 -1.009
sexM 0.303221 0.201342 1.506
age -0.004672 0.006343 -0.736
wakeupTime_dec -0.034453 0.011012 -3.129

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.122
log_between -0.523 0.034
sexM -0.168 -0.004 0.034
age -0.575 0.010 -0.239 -0.049
wakeupTm_dc -0.396 0.308 0.110 -0.014 0.034

Robustness weights for the residuals:
4427 weights are ~= 1. The remaining 1233 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.610 0.775 0.751 0.921 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.397 0.658 0.819 0.795 0.952 0.988

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5653) | p
(Intercept) | 4.41 | 0.31 | [3.79, 5.02] | 14.01 | < .001
log within | 6.77e-03 | 6.73e-03 | [-0.01, 0.02] | 1.01 | 0.315
log between | -0.06 | 0.05 | [-0.16, 0.05] | -1.01 | 0.313
sex [M] | 0.30 | 0.20 | [-0.09, 0.70] | 1.51 | 0.132
age | -4.67e-03 | 6.34e-03 | [-0.02, 0.01] | -0.74 | 0.461
wakeupTime dec | -0.03 | 0.01 | [-0.06, -0.01] | -3.13 | 0.002

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 1.15
SD (Residual) | 0.90

```
=====
OUTCOME: appetite
EXPOSURE: DAY_12_13
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3176 -0.6063 0.0019 0.6008 6.1134

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3383 1.1568
Residual 0.8074 0.8985
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.406518 0.364969 12.074
log_within 0.000479 0.007506 0.064
log_between -0.043867 0.067352 -0.651
sexM 0.309063 0.202625 1.525
age -0.005191 0.006304 -0.823
wakeupTime_dec -0.035542 0.010731 -3.312

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.074
log_between -0.678 0.020
sexM -0.161 -0.003 0.045
age -0.487 0.009 -0.186 -0.050
wakeupTm_dc -0.351 0.212 0.096 -0.012 0.040

Robustness weights for the residuals:
4426 weights are ~= 1. The remaining 1235 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.609 0.778 0.751 0.918 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.416 0.659 0.841 0.800 0.954 0.984

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.41	0.36	[3.69, 5.12]	12.07	< .001
log within	4.79e-04	7.51e-03	[-0.01, 0.02]	0.06	0.949
log between	-0.04	0.07	[-0.18, 0.09]	-0.65	0.515
sex [M]	0.31	0.20	[-0.09, 0.71]	1.53	0.127
age	-5.19e-03	6.30e-03	[-0.02, 0.01]	-0.82	0.410
wakeupTime dec	-0.04	0.01	[-0.06, -0.01]	-3.31	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90

```
=====
OUTCOME: appetite
EXPOSURE: DAY_13_14
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3650 -0.6084 0.0050 0.6014 6.1432

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3469 1.1606
Residual 0.8048 0.8971
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.472164 0.423279 10.566
log_within -0.014156 0.007409 -1.911
log_between -0.041464 0.082394 -0.503
sexM 0.302779 0.203345 1.489
age -0.005812 0.006284 -0.925
wakeupTime_dec -0.040988 0.010566 -3.879

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.043
log_between -0.773 0.010
sexM -0.157 -0.002 0.057
age -0.417 0.007 -0.150 -0.050
wakeupTm_dc -0.298 0.146 0.071 -0.013 0.048

Robustness weights for the residuals:
4432 weights are ~= 1. The remaining 1227 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.211 0.604 0.775 0.748 0.913 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.415 0.657 0.843 0.804 0.960 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	4.47	0.42	[3.64, 5.30]	10.57	< .001
log within	-0.01	7.41e-03	[-0.03, 0.00]	-1.91	0.056
log between	-0.04	0.08	[-0.20, 0.12]	-0.50	0.615
sex [M]	0.30	0.20	[-0.10, 0.70]	1.49	0.137
age	-5.81e-03	6.28e-03	[-0.02, 0.01]	-0.92	0.355
wakeupTime dec	-0.04	0.01	[-0.06, -0.02]	-3.88	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90

=====
OUTCOME: appetite
EXPOSURE: DAY_14_15
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3446 -0.6087 0.0069 0.5989 6.1829

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3382 1.1568
Residual 0.8057 0.8976
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.452267 0.440304 10.112
log_within -0.006234 0.006788 -0.918
log_between -0.037668 0.085007 -0.443
sexM 0.308042 0.203104 1.517
age -0.006327 0.006208 -1.019
wakeupTime_dec -0.038828 0.010502 -3.697

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.023
log_between -0.794 0.003
sexM -0.174 -0.001 0.083
age -0.461 0.005 -0.068 -0.048
wakeupTm_dc -0.266 0.088 0.040 -0.013 0.056

Robustness weights for the residuals:
4422 weights are ~= 1. The remaining 1237 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.212 0.607 0.776 0.750 0.920 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.414 0.653 0.836 0.801 0.955 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5652) | p
(Intercept) | 4.45 | 0.44 | [3.59, 5.32] | 10.11 | < .001
log within | -6.23e-03 | 6.79e-03 | [-0.02, 0.01] | -0.92 | 0.358
log between | -0.04 | 0.09 | [-0.20, 0.13] | -0.44 | 0.658
sex [M] | 0.31 | 0.20 | [-0.09, 0.71] | 1.52 | 0.129
age | -6.33e-03 | 6.21e-03 | [-0.02, 0.01] | -1.02 | 0.308
wakeupTime dec | -0.04 | 0.01 | [-0.06, -0.02] | -3.70 | < .001

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 1.16
SD (Residual) | 0.90

```
=====
OUTCOME: appetite
EXPOSURE: DAY_15_16
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3478 -0.6081 0.0045 0.6019 6.2053

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3391 1.1572
Residual 0.8008 0.8949
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.361879 0.429416 10.158
log_within -0.006956 0.006673 -1.042
log_between -0.018501 0.080463 -0.230
sexM 0.308907 0.202574 1.525
age -0.006138 0.006196 -0.991
wakeupTime_dec -0.038259 0.010454 -3.660

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.019
log_between -0.782 0.003
sexM -0.141 -0.001 0.037
age -0.541 0.004 0.015 -0.042
wakeupTm_dc -0.273 0.069 0.045 -0.015 0.059

Robustness weights for the residuals:
4423 weights are ~= 1. The remaining 1236 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.212 0.609 0.775 0.749 0.919 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.411 0.655 0.838 0.802 0.964 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	4.36	0.43	[3.52, 5.20]	10.16	< .001
log within	-6.96e-03	6.67e-03	[-0.02, 0.01]	-1.04	0.297
log between	-0.02	0.08	[-0.18, 0.14]	-0.23	0.818
sex [M]	0.31	0.20	[-0.09, 0.71]	1.52	0.127
age	-6.14e-03	6.20e-03	[-0.02, 0.01]	-0.99	0.322
wakeupTime dec	-0.04	0.01	[-0.06, -0.02]	-3.66	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.89

```

=====
OUTCOME: appetite
EXPOSURE: DAY_16_17
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3223 -0.6045  0.0035  0.6036  6.1725

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3453    1.160
Residual                   0.8064    0.898
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.283497   0.408750  10.479
log_within      0.002161   0.006815   0.317
log_between    -0.008680   0.084981  -0.102
sexM            0.308672   0.203248   1.519
age            -0.006066   0.006209  -0.977
wakeupTime_dec -0.034639   0.010463  -3.311

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.019
log_between -0.755  0.003
sexM        -0.072 -0.001 -0.060
age         -0.557  0.004  0.000 -0.042
wakeupTm_dc -0.279  0.070  0.037 -0.019  0.059

Robustness weights for the residuals:
4421 weights are ~= 1. The remaining 1240 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.213  0.608   0.777   0.752  0.920   0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.419  0.668   0.843   0.808  0.956   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.28 | 0.41 | [ 3.48, 5.08] | 10.48 | < .001
log within | 2.16e-03 | 6.82e-03 | [-0.01, 0.02] | 0.32 | 0.751
log between | -8.68e-03 | 0.08 | [-0.18, 0.16] | -0.10 | 0.919
sex [M] | 0.31 | 0.20 | [-0.09, 0.71] | 1.52 | 0.129
age | -6.07e-03 | 6.21e-03 | [-0.02, 0.01] | -0.98 | 0.329
wakeupTime dec | -0.03 | 0.01 | [-0.06, -0.01] | -3.31 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.16
SD (Residual) | 0.90

```

```
=====
OUTCOME: appetite
EXPOSURE: DAY_17_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3228 -0.6036 0.0041 0.6035 6.1769

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.343 1.1590
Residual 0.806 0.8978
Number of obs: 5655, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.4073802 0.3919354 11.245
log_within 0.0004299 0.0072719 0.059
log_between -0.0481190 0.0989265 -0.486
sexM 0.3186315 0.2042935 1.560
age -0.0064582 0.0062101 -1.040
wakeupTime_dec -0.0355300 0.0104719 -3.393

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.016
log_between -0.730 0.001
sexM -0.032 -0.001 -0.123
age -0.611 0.003 0.042 -0.047
wakeupTm_dc -0.279 0.056 0.023 -0.019 0.059

Robustness weights for the residuals:
4414 weights are ~= 1. The remaining 1241 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.612 0.777 0.752 0.921 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.419 0.674 0.844 0.810 0.969 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5648)	p
(Intercept)	4.41	0.39	[3.64, 5.18]	11.25	< .001
log within	4.30e-04	7.27e-03	[-0.01, 0.01]	0.06	0.953
log between	-0.05	0.10	[-0.24, 0.15]	-0.49	0.627
sex [M]	0.32	0.20	[-0.08, 0.72]	1.56	0.119
age	-6.46e-03	6.21e-03	[-0.02, 0.01]	-1.04	0.298
wakeupTime dec	-0.04	0.01	[-0.06, -0.02]	-3.39	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90

```
=====
OUTCOME: appetite
EXPOSURE: DAY_8_9
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3535 -0.6082 0.0057 0.6043 6.1897

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3456 1.1600
Residual 0.8032 0.8962
Number of obs: 5662, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.262479 0.271907 15.676
log_within 0.006669 0.005655 1.179
log_between -0.025285 0.043750 -0.578
sexM 0.283161 0.204216 1.387
age -0.006058 0.006332 -0.957
wakeupTime_dec -0.034253 0.011468 -2.987

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.163
log_between 0.032 0.050
sexM -0.171 -0.001 0.113
age -0.833 0.015 -0.193 -0.063
wakeupTm_dc -0.403 0.403 0.124 -0.004 0.038

Robustness weights for the residuals:
4424 weights are ~= 1. The remaining 1238 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.212 0.611 0.776 0.750 0.917 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.404 0.666 0.822 0.799 0.950 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5655)	p
(Intercept)	4.26	0.27	[3.73, 4.80]	15.68	< .001
log within	6.67e-03	5.65e-03	[0.00, 0.02]	1.18	0.238
log between	-0.03	0.04	[-0.11, 0.06]	-0.58	0.563
sex [M]	0.28	0.20	[-0.12, 0.68]	1.39	0.166
age	-6.06e-03	6.33e-03	[-0.02, 0.01]	-0.96	0.339
wakeupTime dec	-0.03	0.01	[-0.06, -0.01]	-2.99	0.003

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90


```
=====
OUTCOME: appetite
EXPOSURE: DAY_9_10
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3233 -0.6069 0.0034 0.6066 6.1863

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3307 1.1536
Residual 0.8079 0.8988
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.258179 0.274635 15.505
log_within 0.007460 0.005785 1.290
log_between -0.032267 0.042248 -0.764
sexM 0.285365 0.202429 1.410
age -0.005193 0.006374 -0.815
wakeupTime_dec -0.031734 0.011762 -2.698

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.192
log_between -0.145 0.059
sexM -0.183 -0.003 0.074
age -0.770 0.013 -0.245 -0.060
wakeupTm_dc -0.432 0.444 0.133 -0.008 0.031

Robustness weights for the residuals:
4427 weights are ~= 1. The remaining 1234 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.609 0.774 0.751 0.919 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.408 0.666 0.820 0.795 0.936 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.26	0.27	[3.72, 4.80]	15.50	< .001
log within	7.46e-03	5.78e-03	[0.00, 0.02]	1.29	0.197
log between	-0.03	0.04	[-0.12, 0.05]	-0.76	0.445
sex [M]	0.29	0.20	[-0.11, 0.68]	1.41	0.159
age	-5.19e-03	6.37e-03	[-0.02, 0.01]	-0.81	0.415
wakeupTime dec	-0.03	0.01	[-0.05, -0.01]	-2.70	0.007

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.15
SD (Residual)	0.90

```
=====
OUTCOME: appetite
EXPOSURE: DAY_sunrise_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3054 -0.6057 0.0038 0.6061 6.1598

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3383 1.1569
Residual 0.8103 0.9002
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.270550 0.286914 14.884
log_within 0.005331 0.007495 0.711
log_between 0.007379 0.059471 0.124
sexM 0.312310 0.203757 1.533
age -0.005962 0.006216 -0.959
wakeupTime_dec -0.035728 0.010925 -3.270

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.091
log_between 0.346 0.024
sexM -0.125 -0.002 0.115
age -0.820 0.014 -0.082 -0.052
wakeupTm_dc -0.339 0.269 0.090 -0.007 0.053

Robustness weights for the residuals:
4427 weights are ~= 1. The remaining 1234 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.612 0.778 0.751 0.922 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.423 0.664 0.848 0.805 0.955 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.27	0.29	[3.71, 4.83]	14.88	< .001
log within	5.33e-03	7.50e-03	[-0.01, 0.02]	0.71	0.477
log between	7.38e-03	0.06	[-0.11, 0.12]	0.12	0.901
sex [M]	0.31	0.20	[-0.09, 0.71]	1.53	0.125
age	-5.96e-03	6.22e-03	[-0.02, 0.01]	-0.96	0.338
wakeupTime dec	-0.04	0.01	[-0.06, -0.01]	-3.27	0.001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90

```

=====
OUTCOME: appetite
EXPOSURE: LAN_0.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.4896 -0.5750 -0.0112  0.6054  4.5522

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3719   1.1713
Residual                   0.7417   0.8612
Number of obs: 2255, groups: id, 139

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.865801   0.341659  11.315
log_within     -0.014112   0.008479  -1.664
log_between     0.042439   0.064946   0.653
sexM            0.253356   0.242951   1.043
age            -0.004075   0.007283  -0.559
ms              0.025627   0.032841   0.780

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.025
log_between 0.372 -0.001
sexM        -0.172 -0.003 -0.127
age         -0.838  0.004 -0.202 -0.044
ms_dia_sgnt -0.391  0.060 -0.038 -0.024  0.046

Robustness weights for the residuals:
1783 weights are ~= 1. The remaining 472 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.207  0.586   0.762   0.741  0.920   0.999

Robustness weights for the random effects:
115 weights are ~= 1. The remaining 24 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.404  0.680   0.822   0.788  0.914   0.988

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2248) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.87 | 0.34 | [ 3.20, 4.54] | 11.31 | < .001
log within | -0.01 | 8.48e-03 | [-0.03, 0.00] | -1.66 | 0.096
log between | 0.04 | 0.06 | [-0.08, 0.17] | 0.65 | 0.514
sex [M] | 0.25 | 0.24 | [-0.22, 0.73] | 1.04 | 0.297
age | -4.07e-03 | 7.28e-03 | [-0.02, 0.01] | -0.56 | 0.576
ms | 0.03 | 0.03 | [-0.04, 0.09] | 0.78 | 0.435

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.17
SD (Residual) | 0.86

```

```

=====
OUTCOME: appetite
EXPOSURE: LAN_1.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.4934 -0.5860 -0.0133  0.6203  4.5306

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.3575   1.1651
Residual                   0.7438   0.8624
Number of obs: 3382, groups: id, 151

Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.7978217  0.2914544  13.031
log_within    0.0005017  0.0076486   0.066
log_between   0.0872567  0.0725019   1.204
sexM          0.2031361  0.2241900   0.906
age          -0.0007874  0.0067732  -0.116
ms           -0.0012583  0.0235154  -0.054

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.016
log_between 0.077 -0.003
sexM        -0.158  0.000 -0.132
age         -0.856  0.002 -0.082 -0.057
ms_dia_sgnt -0.374  0.046 -0.023 -0.020  0.060

Robustness weights for the residuals:
2647 weights are ~= 1. The remaining 735 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.207  0.606   0.761   0.744   0.920   0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 26 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.406  0.624   0.772   0.762   0.895   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3375) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.80 | 0.29 | [ 3.23, 4.37] | 13.03 | < .001
log within | 5.02e-04 | 7.65e-03 | [-0.01, 0.02] | 0.07 | 0.948
log between | 0.09 | 0.07 | [-0.05, 0.23] | 1.20 | 0.229
sex [M] | 0.20 | 0.22 | [-0.24, 0.64] | 0.91 | 0.365
age | -7.87e-04 | 6.77e-03 | [-0.01, 0.01] | -0.12 | 0.907
ms | -1.26e-03 | 0.02 | [-0.05, 0.04] | -0.05 | 0.957

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.17
SD (Residual) | 0.86

```

```

=====
OUTCOME: appetite
EXPOSURE: LAN_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.4446 -0.5884  0.0040  0.6087  4.5279

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.334     1.1551
Residual                   0.747     0.8643
Number of obs: 2829, groups: id, 145

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.942469   0.308120  12.795
log_within     -0.001365   0.007867  -0.173
log_between     0.127054   0.068567   1.853
sexM            0.275312   0.228230   1.206
age            -0.004491   0.006895  -0.651
ms              0.012660   0.027844   0.455

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.017
log_between 0.239 -0.002
sexM        -0.162  0.000 -0.098
age         -0.847  0.002 -0.152 -0.056
ms_dia_sgnt -0.387  0.044 -0.029 -0.022  0.049

Robustness weights for the residuals:
2220 weights are ~= 1. The remaining 609 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.209  0.603   0.765   0.746  0.914   0.999

Robustness weights for the random effects:
118 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.401  0.649   0.818   0.794  0.957   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2822) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.94 | 0.31 | [ 3.34, 4.55] | 12.80 | < .001
log within | -1.36e-03 | 7.87e-03 | [-0.02, 0.01] | -0.17 | 0.862
log between | 0.13 | 0.07 | [-0.01, 0.26] | 1.85 | 0.064
sex [M] | 0.28 | 0.23 | [-0.17, 0.72] | 1.21 | 0.228
age | -4.49e-03 | 6.89e-03 | [-0.02, 0.01] | -0.65 | 0.515
ms | 0.01 | 0.03 | [-0.04, 0.07] | 0.45 | 0.649

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.16
SD (Residual) | 0.86

```

```
=====
OUTCOME: appetite
EXPOSURE: LAN_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.6165 -0.5894 -0.0188 0.6168 4.5644

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.2982 1.1394
Residual 0.7364 0.8582
Number of obs: 4093, groups: id, 160

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.7264819 0.2792464 13.345
log_within 0.0015647 0.0078602 0.199
log_between 0.1474112 0.0760017 1.940
sexM 0.1994393 0.2108618 0.946
age -0.0014355 0.0064983 -0.221
ms -0.0008186 0.0195664 -0.042

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.016
log_between -0.157 -0.003
sexM -0.143 0.000 -0.107
age -0.852 0.003 0.000 -0.055
ms_dia_sgnt -0.352 0.048 -0.015 -0.020 0.066

Robustness weights for the residuals:
3206 weights are ~= 1. The remaining 887 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.203 0.606 0.765 0.745 0.915 0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.404 0.694 0.794 0.792 0.943 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4086)	p
(Intercept)	3.73	0.28	[3.18, 4.27]	13.34	< .001
log within	1.56e-03	7.86e-03	[-0.01, 0.02]	0.20	0.842
log between	0.15	0.08	[0.00, 0.30]	1.94	0.052
sex [M]	0.20	0.21	[-0.21, 0.61]	0.95	0.344
age	-1.44e-03	6.50e-03	[-0.01, 0.01]	-0.22	0.825
ms	-8.19e-04	0.02	[-0.04, 0.04]	-0.04	0.967

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.14
SD (Residual)	0.86

```

=====
OUTCOME: appetite
EXPOSURE: LAN_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5195 -0.6045 -0.0061  0.6145  4.5183

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3118    1.1453
Residual                   0.7487    0.8653
Number of obs: 3762, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.7170937  0.2823586  13.164
log_within     0.0052762  0.0077979   0.677
log_between    0.1190895  0.0710928   1.675
sexM           0.2261072  0.2177644   1.038
age            -0.0004397  0.0065965  -0.067
ms             0.0011622  0.0215680   0.054

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.023
log_between -0.061 -0.004
sexM        -0.139 -0.001 -0.107
age         -0.855  0.003 -0.023 -0.068
ms_dia_sgnt -0.366  0.067 -0.030 -0.014  0.061

Robustness weights for the residuals:
2952 weights are ~= 1. The remaining 810 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.206  0.610   0.771   0.747  0.919   0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.405  0.653   0.770   0.774  0.931   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3755) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.72 | 0.28 | [ 3.16, 4.27] | 13.16 | < .001
log within | 5.28e-03 | 7.80e-03 | [-0.01, 0.02] | 0.68 | 0.499
log between | 0.12 | 0.07 | [-0.02, 0.26] | 1.68 | 0.094
sex [M] | 0.23 | 0.22 | [-0.20, 0.65] | 1.04 | 0.299
age | -4.40e-04 | 6.60e-03 | [-0.01, 0.01] | -0.07 | 0.947
ms | 1.16e-03 | 0.02 | [-0.04, 0.04] | 0.05 | 0.957

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.87

```

```
=====
OUTCOME: appetite
EXPOSURE: LAN_20_21
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4732 -0.6061 0.0212 0.6093 5.6930

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4446 1.2019
Residual 0.7457 0.8635
Number of obs: 5092, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.667907 0.339403 10.807
log_within 0.003109 0.008358 0.372
log_between 0.094038 0.103884 0.905
sexM 0.301003 0.213946 1.407
age -0.003488 0.006528 -0.534
wakeupTime_dec 0.002831 0.010742 0.264

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.003
log_between -0.570 0.000
sexM -0.078 -0.001 -0.110
age -0.764 -0.002 0.124 -0.065
wakeupTm_dc -0.309 0.017 -0.001 -0.019 0.058

Robustness weights for the residuals:
3976 weights are ~= 1. The remaining 1116 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.208 0.612 0.769 0.747 0.916 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.429 0.676 0.860 0.812 0.967 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5085)	p
(Intercept)	3.67	0.34	[3.00, 4.33]	10.81	< .001
log within	3.11e-03	8.36e-03	[-0.01, 0.02]	0.37	0.710
log between	0.09	0.10	[-0.11, 0.30]	0.91	0.365
sex [M]	0.30	0.21	[-0.12, 0.72]	1.41	0.160
age	-3.49e-03	6.53e-03	[-0.02, 0.01]	-0.53	0.593
wakeupTime dec	2.83e-03	0.01	[-0.02, 0.02]	0.26	0.792

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	0.86


```
=====
OUTCOME: appetite
EXPOSURE: LAN_21_22
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4562 -0.6020 0.0194 0.6068 5.6870

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4377 1.1990
Residual 0.7492 0.8655
Number of obs: 5106, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.7025323 0.3115753 11.883
log_within 0.0003503 0.0079867 0.044
log_between 0.1132269 0.0895314 1.265
sexM 0.2741814 0.2148267 1.276
age -0.0034416 0.0065073 -0.529
wakeupTime_dec -0.0008425 0.0108113 -0.078

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.448 -0.004
sexM -0.082 -0.001 -0.157
age -0.807 -0.001 0.116 -0.069
wakeupTm_dc -0.329 0.012 -0.023 -0.015 0.056

Robustness weights for the residuals:
3984 weights are ~= 1. The remaining 1122 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.208 0.610 0.768 0.749 0.919 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.412 0.694 0.857 0.812 0.965 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5099)	p
(Intercept)	3.70	0.31	[3.09, 4.31]	11.88	< .001
log within	3.50e-04	7.99e-03	[-0.02, 0.02]	0.04	0.965
log between	0.11	0.09	[-0.06, 0.29]	1.26	0.206
sex [M]	0.27	0.21	[-0.15, 0.70]	1.28	0.202
age	-3.44e-03	6.51e-03	[-0.02, 0.01]	-0.53	0.597
wakeupTime dec	-8.42e-04	0.01	[-0.02, 0.02]	-0.08	0.938

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	0.87

```
=====
OUTCOME: appetite
EXPOSURE: LAN_22_23
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4673 -0.6109 0.0204 0.6100 5.6868

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4599 1.2083
Residual 0.7476 0.8646
Number of obs: 5101, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.8598858 0.2862506 13.484
log_within 0.0018633 0.0067992 0.274
log_between -0.0007048 0.0701235 -0.010
sexM 0.3235880 0.2184921 1.481
age -0.0042607 0.0065616 -0.649
wakeupTime_dec 0.0012931 0.0108080 0.120

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.202 -0.001
sexM -0.123 0.001 -0.208
age -0.852 -0.001 0.124 -0.076
wakeupTm_dc -0.357 0.005 -0.057 -0.006 0.051

Robustness weights for the residuals:
3979 weights are ~= 1. The remaining 1122 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.208 0.609 0.766 0.748 0.918 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.423 0.684 0.837 0.813 0.961 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5094)	p
(Intercept)	3.86	0.29	[3.30, 4.42]	13.48	< .001
log within	1.86e-03	6.80e-03	[-0.01, 0.02]	0.27	0.784
log between	-7.05e-04	0.07	[-0.14, 0.14]	-0.01	0.992
sex [M]	0.32	0.22	[-0.10, 0.75]	1.48	0.139
age	-4.26e-03	6.56e-03	[-0.02, 0.01]	-0.65	0.516
wakeupTime dec	1.29e-03	0.01	[-0.02, 0.02]	0.12	0.905

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	0.86

```
=====
OUTCOME: appetite
EXPOSURE: LAN_23_0
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.5074 -0.6088 0.0114 0.6089 5.6219

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4584 1.208
Residual 0.7464 0.864
Number of obs: 5096, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.843104 0.280903 13.681
log_within 0.011536 0.006293 1.833
log_between -0.025285 0.059416 -0.426
sexM 0.354951 0.220820 1.607
age -0.004584 0.006548 -0.700
wakeupTime_dec 0.002475 0.010827 0.229

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.016
log_between 0.072 0.002
sexM -0.185 0.000 -0.253
age -0.835 -0.004 0.110 -0.078
wakeupTm_dc -0.381 -0.036 -0.086 0.003 0.048

Robustness weights for the residuals:
3980 weights are ~= 1. The remaining 1116 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.207 0.612 0.765 0.746 0.913 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.431 0.693 0.843 0.812 0.968 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5089)	p
(Intercept)	3.84	0.28	[3.29, 4.39]	13.68	< .001
log within	0.01	6.29e-03	[0.00, 0.02]	1.83	0.067
log between	-0.03	0.06	[-0.14, 0.09]	-0.43	0.670
sex [M]	0.35	0.22	[-0.08, 0.79]	1.61	0.108
age	-4.58e-03	6.55e-03	[-0.02, 0.01]	-0.70	0.484
wakeupTime dec	2.48e-03	0.01	[-0.02, 0.02]	0.23	0.819

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	0.86

```

=====
OUTCOME: appetite
EXPOSURE: LAN_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.6889 -0.5914 -0.0156  0.6215  5.2255

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3243    1.1508
Residual                   0.7395    0.8599
Number of obs: 4262, groups: id, 164

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.779148   0.279577  13.517
log_within      0.001371   0.008364   0.164
log_between     0.105012   0.077863   1.349
sexM            0.183127   0.210638   0.869
age            -0.002288   0.006430  -0.356
ms             -0.007201   0.018511  -0.389

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.023
log_between -0.225 -0.004
sexM        -0.123  0.000 -0.098
age         -0.841  0.004  0.006 -0.073
ms_dia_sgnt -0.342  0.072 -0.024 -0.021  0.068

Robustness weights for the residuals:
3336 weights are ~= 1. The remaining 926 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.201  0.606   0.767   0.747   0.914   0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.403  0.697   0.801   0.779   0.901   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4255) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.78 | 0.28 | [ 3.23, 4.33] | 13.52 | < .001
log within | 1.37e-03 | 8.36e-03 | [-0.02, 0.02] | 0.16 | 0.870
log between | 0.11 | 0.08 | [-0.05, 0.26] | 1.35 | 0.178
sex [M] | 0.18 | 0.21 | [-0.23, 0.60] | 0.87 | 0.385
age | -2.29e-03 | 6.43e-03 | [-0.01, 0.01] | -0.36 | 0.722
ms | -7.20e-03 | 0.02 | [-0.04, 0.03] | -0.39 | 0.697

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.86

```

```
=====
OUTCOME: appetite
EXPOSURE: LAN_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.7693 -0.6078 0.0104 0.6087 5.8913

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3992 1.1829
Residual 0.7239 0.8508
Number of obs: 4809, groups: id, 166

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.835016 0.323398 11.858
log_within 0.005905 0.011739 0.503
log_between 0.071725 0.101314 0.708
sexM 0.320399 0.211830 1.513
age -0.002940 0.006536 -0.450
ms -0.024206 0.014187 -1.706

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.002
log_between -0.553 -0.001
sexM -0.104 0.001 -0.053
age -0.783 -0.001 0.108 -0.074
ms_dia_sgnt -0.242 0.000 -0.019 -0.031 0.067

Robustness weights for the residuals:
3746 weights are ~= 1. The remaining 1063 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.199 0.606 0.769 0.748 0.914 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.423 0.678 0.830 0.808 0.970 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4802)	p
(Intercept)	3.84	0.32	[3.20, 4.47]	11.86	< .001
log within	5.91e-03	0.01	[-0.02, 0.03]	0.50	0.615
log between	0.07	0.10	[-0.13, 0.27]	0.71	0.479
sex [M]	0.32	0.21	[-0.09, 0.74]	1.51	0.130
age	-2.94e-03	6.54e-03	[-0.02, 0.01]	-0.45	0.653
ms	-0.02	0.01	[-0.05, 0.00]	-1.71	0.088

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	0.85

```
=====
OUTCOME: appetite
EXPOSURE: LAN_sunset_20
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4580 -0.6105 0.0185 0.6106 5.6873

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4601 1.2084
Residual 0.7487 0.8653
Number of obs: 5099, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.9216435 0.3564845 11.001
log_within 0.0030506 0.0092917 0.328
log_between -0.0202425 0.1153311 -0.176
sexM 0.3292073 0.2137937 1.540
age -0.0047860 0.0065357 -0.732
wakeupTime_dec 0.0004886 0.0108065 0.045

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.010
log_between -0.618 0.000
sexM -0.142 0.000 0.010
age -0.719 0.001 0.086 -0.051
wakeupTm_dc -0.302 0.037 0.009 -0.019 0.059

Robustness weights for the residuals:
3983 weights are ~= 1. The remaining 1116 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.208 0.609 0.766 0.748 0.917 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.423 0.675 0.835 0.808 0.957 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5092)	p
(Intercept)	3.92	0.36	[3.22, 4.62]	11.00	< .001
log within	3.05e-03	9.29e-03	[-0.02, 0.02]	0.33	0.743
log between	-0.02	0.12	[-0.25, 0.21]	-0.18	0.861
sex [M]	0.33	0.21	[-0.09, 0.75]	1.54	0.124
age	-4.79e-03	6.54e-03	[-0.02, 0.01]	-0.73	0.464
wakeupTime dec	4.89e-04	0.01	[-0.02, 0.02]	0.05	0.964

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	0.87

```
=====
OUTCOME: appetite
EXPOSURE: LAN_0_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3805 -0.6056 0.0049 0.6135 6.1880

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3426 1.1587
Residual 0.8068 0.8982
Number of obs: 5657, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.356139 0.282950 15.395
log_within 0.013750 0.006661 2.064
log_between 0.032991 0.060454 0.546
sexM 0.283260 0.205693 1.377
age -0.005842 0.006242 -0.936
wakeupTime_dec -0.040844 0.010715 -3.812

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.076
log_between 0.314 0.020
sexM -0.220 0.000 -0.169
age -0.766 -0.009 0.110 -0.060
wakeupTm_dc -0.400 -0.189 -0.104 0.002 0.048

Robustness weights for the residuals:
4416 weights are ~= 1. The remaining 1241 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.211 0.616 0.774 0.751 0.919 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.409 0.667 0.834 0.804 0.947 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5650)	p
(Intercept)	4.36	0.28	[3.80, 4.91]	15.40	< .001
log within	0.01	6.66e-03	[0.00, 0.03]	2.06	0.039
log between	0.03	0.06	[-0.09, 0.15]	0.55	0.585
sex [M]	0.28	0.21	[-0.12, 0.69]	1.38	0.169
age	-5.84e-03	6.24e-03	[-0.02, 0.01]	-0.94	0.349
wakeupTime dec	-0.04	0.01	[-0.06, -0.02]	-3.81	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90

```
=====
OUTCOME: appetite
EXPOSURE: LAN_1_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3194 -0.6046 0.0047 0.6084 6.1646

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3595 1.1660
Residual 0.8087 0.8993
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.217763 0.313259 13.464
log_within -0.006561 0.008421 -0.779
log_between -0.016844 0.070729 -0.238
sexM 0.320651 0.204987 1.564
age -0.006291 0.006288 -1.000
wakeupTime_dec -0.035153 0.010675 -3.293

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.061
log_between 0.507 0.015
sexM -0.204 0.001 -0.099
age -0.666 -0.008 0.119 -0.053
wakeupTm_dc -0.378 -0.161 -0.092 -0.007 0.047

Robustness weights for the residuals:
4426 weights are ~= 1. The remaining 1235 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.610 0.775 0.750 0.918 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.422 0.670 0.848 0.811 0.961 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.22	0.31	[3.60, 4.83]	13.46	< .001
log within	-6.56e-03	8.42e-03	[-0.02, 0.01]	-0.78	0.436
log between	-0.02	0.07	[-0.16, 0.12]	-0.24	0.812
sex [M]	0.32	0.20	[-0.08, 0.72]	1.56	0.118
age	-6.29e-03	6.29e-03	[-0.02, 0.01]	-1.00	0.317
wakeupTime dec	-0.04	0.01	[-0.06, -0.01]	-3.29	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.90


```
=====
OUTCOME: appetite
EXPOSURE: LAN_2_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3059 -0.6040 0.0046 0.6045 6.1504

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3517 1.1626
Residual 0.8106 0.9003
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.208250 0.347510 12.110
log_within -0.007012 0.010871 -0.645
log_between -0.012253 0.081672 -0.150
sexM 0.305964 0.203421 1.504
age -0.006176 0.006252 -0.988
wakeupTime_dec -0.033363 0.010740 -3.106

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.065
log_between 0.631 0.016
sexM -0.134 0.003 0.007
age -0.598 -0.009 0.092 -0.041
wakeupTm_dc -0.354 -0.184 -0.085 -0.017 0.051

Robustness weights for the residuals:
4421 weights are ~= 1. The remaining 1240 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.612 0.777 0.752 0.920 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.418 0.650 0.831 0.796 0.958 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.21	0.35	[3.53, 4.89]	12.11	< .001
log within	-7.01e-03	0.01	[-0.03, 0.01]	-0.65	0.519
log between	-0.01	0.08	[-0.17, 0.15]	-0.15	0.881
sex [M]	0.31	0.20	[-0.09, 0.70]	1.50	0.133
age	-6.18e-03	6.25e-03	[-0.02, 0.01]	-0.99	0.323
wakeupTime dec	-0.03	0.01	[-0.05, -0.01]	-3.11	0.002

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90

```
=====
OUTCOME: appetite
EXPOSURE: LAN_3_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.2898 -0.6019 0.0044 0.6051 6.1562

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3437 1.1592
Residual 0.8107 0.9004
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.071036 0.428644 9.497
log_within -0.008019 0.013197 -0.608
log_between -0.056230 0.110485 -0.509
sexM 0.286197 0.203430 1.407
age -0.006224 0.006219 -1.001
wakeupTime_dec -0.033107 0.010758 -3.078

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.047
log_between 0.779 0.010
sexM -0.051 0.003 0.077
age -0.484 -0.009 0.060 -0.038
wakeupTm_dc -0.294 -0.159 -0.063 -0.021 0.056

Robustness weights for the residuals:
4423 weights are ~= 1. The remaining 1238 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.214 0.613 0.778 0.751 0.919 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.418 0.649 0.841 0.794 0.942 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.07	0.43	[3.23, 4.91]	9.50	< .001
log within	-8.02e-03	0.01	[-0.03, 0.02]	-0.61	0.543
log between	-0.06	0.11	[-0.27, 0.16]	-0.51	0.611
sex [M]	0.29	0.20	[-0.11, 0.68]	1.41	0.160
age	-6.22e-03	6.22e-03	[-0.02, 0.01]	-1.00	0.317
wakeupTime dec	-0.03	0.01	[-0.05, -0.01]	-3.08	0.002

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	0.90

```

=====
OUTCOME: appetite
EXPOSURE: LAN_4_5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3114 -0.6029  0.0042  0.6043  6.1636

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.301     1.1408
Residual                   0.809     0.8995
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.437981   0.486835   7.062
log_within    -0.018518   0.016186  -1.144
log_between   -0.239175   0.124684  -1.918
sexM           0.222783   0.201879   1.104
age           -0.005515   0.006114  -0.902
wakeupTime_dec -0.031715   0.010627  -2.984

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.024
log_between    0.839  0.003
sexM           0.028  0.002  0.148
age           -0.482 -0.006 -0.024 -0.046
wakeupTm_dc -0.242 -0.100 -0.034 -0.022  0.061

Robustness weights for the residuals:
4424 weights are ~= 1. The remaining 1237 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.213  0.611  0.781  0.751  0.918  0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.414  0.620  0.799  0.769  0.912  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.44 | 0.49 | [ 2.48, 4.39] | 7.06 | < .001
log within | -0.02 | 0.02 | [-0.05, 0.01] | -1.14 | 0.253
log between | -0.24 | 0.12 | [-0.48, 0.01] | -1.92 | 0.055
sex [M] | 0.22 | 0.20 | [-0.17, 0.62] | 1.10 | 0.270
age | -5.51e-03 | 6.11e-03 | [-0.02, 0.01] | -0.90 | 0.367
wakeupTime dec | -0.03 | 0.01 | [-0.05, -0.01] | -2.98 | 0.003

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.14
SD (Residual) | 0.90

```

```
=====
OUTCOME: appetite
EXPOSURE: LAN_5_sunrise
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.2933 -0.6024 0.0043 0.6052 6.1752

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3064 1.1430
Residual 0.8066 0.8981
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.996417 0.581478 5.153
log_within -0.008273 0.018174 -0.455
log_between -0.374192 0.155672 -2.404
sexM 0.182604 0.205728 0.888
age -0.004548 0.006166 -0.738
wakeupTime_dec -0.033713 0.010542 -3.198

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between 0.890 0.000
sexM 0.129 0.000 0.234
age -0.488 -0.001 -0.117 -0.069
wakeupTm_dc -0.159 -0.008 0.021 -0.012 0.058

Robustness weights for the residuals:
4419 weights are ~= 1. The remaining 1242 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.214 0.609 0.773 0.751 0.920 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.403 0.705 0.852 0.802 0.959 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.00	0.58	[1.86, 4.14]	5.15	< .001
log within	-8.27e-03	0.02	[-0.04, 0.03]	-0.46	0.649
log between	-0.37	0.16	[-0.68, -0.07]	-2.40	0.016
sex [M]	0.18	0.21	[-0.22, 0.59]	0.89	0.375
age	-4.55e-03	6.17e-03	[-0.02, 0.01]	-0.74	0.461
wakeupTime dec	-0.03	0.01	[-0.05, -0.01]	-3.20	0.001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.14
SD (Residual)	0.90

```
=====
OUTCOME: appetite
EXPOSURE: LaW_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3532 -0.6184 0.0083 0.6098 6.2177

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.315 1.1467
Residual 0.797 0.8928
Number of obs: 4982, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.963891 0.268497 14.763
log_within 0.011628 0.005383 2.160
log_between 0.033528 0.055163 0.608
sexM 0.262186 0.201892 1.299
age -0.001490 0.006312 -0.236
ms -0.033322 0.014555 -2.289

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.031
log_between -0.226 0.001
sexM -0.163 0.003 -0.027
age -0.868 -0.006 0.124 -0.054
ms -0.314 -0.100 -0.010 -0.030 0.066

Robustness weights for the residuals:
3932 weights are ~= 1. The remaining 1050 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.212 0.607 0.776 0.746 0.912 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.442 0.655 0.803 0.780 0.910 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4975)	p
(Intercept)	3.96	0.27	[3.44, 4.49]	14.76	< .001
log within	0.01	5.38e-03	[0.00, 0.02]	2.16	0.031
log between	0.03	0.06	[-0.07, 0.14]	0.61	0.543
sex [M]	0.26	0.20	[-0.13, 0.66]	1.30	0.194
age	-1.49e-03	6.31e-03	[-0.01, 0.01]	-0.24	0.813
ms	-0.03	0.01	[-0.06, 0.00]	-2.29	0.022

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.15
SD (Residual)	0.89

```
=====
OUTCOME: appetite
EXPOSURE: LaW_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3655 -0.6075 0.0073 0.6126 6.1946

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.2990 1.1397
Residual 0.8025 0.8958
Number of obs: 4975, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.821495 0.311378 12.273
log_within 0.007275 0.006096 1.193
log_between 0.063071 0.061754 1.021
sexM 0.265788 0.200661 1.325
age -0.001313 0.006268 -0.210
ms -0.031582 0.014545 -2.171

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.549 -0.001
sexM -0.141 0.002 -0.007
age -0.784 -0.003 0.114 -0.051
ms -0.276 -0.064 0.006 -0.030 0.068

Robustness weights for the residuals:
3921 weights are ~= 1. The remaining 1054 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.211 0.606 0.780 0.748 0.916 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.454 0.648 0.800 0.761 0.879 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4968)	p
(Intercept)	3.82	0.31	[3.21, 4.43]	12.27	< .001
log within	7.28e-03	6.10e-03	[0.00, 0.02]	1.19	0.233
log between	0.06	0.06	[-0.06, 0.18]	1.02	0.307
sex [M]	0.27	0.20	[-0.13, 0.66]	1.32	0.185
age	-1.31e-03	6.27e-03	[-0.01, 0.01]	-0.21	0.834
ms	-0.03	0.01	[-0.06, 0.00]	-2.17	0.030

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.14
SD (Residual)	0.90

```
=====
OUTCOME: appetite
EXPOSURE: LaW_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3779 -0.6091 0.0071 0.6110 6.2299

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3100 1.1446
Residual 0.7967 0.8926
Number of obs: 4980, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.900790 0.289941 13.454
log_within 0.010594 0.005632 1.881
log_between 0.040728 0.056795 0.717
sexM 0.268286 0.201464 1.332
age -0.001246 0.006320 -0.197
ms -0.032121 0.014543 -2.209

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.027
log_between -0.434 0.000
sexM -0.156 0.003 -0.002
age -0.838 -0.005 0.146 -0.051
ms -0.293 -0.094 -0.001 -0.030 0.067

Robustness weights for the residuals:
3914 weights are ~= 1. The remaining 1066 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.211 0.608 0.782 0.749 0.918 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.448 0.654 0.811 0.776 0.896 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4973)	p
(Intercept)	3.90	0.29	[3.33, 4.47]	13.45	< .001
log within	0.01	5.63e-03	[0.00, 0.02]	1.88	0.060
log between	0.04	0.06	[-0.07, 0.15]	0.72	0.473
sex [M]	0.27	0.20	[-0.13, 0.66]	1.33	0.183
age	-1.25e-03	6.32e-03	[-0.01, 0.01]	-0.20	0.844
ms	-0.03	0.01	[-0.06, 0.00]	-2.21	0.027

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.14
SD (Residual)	0.89

```

=====
OUTCOME: appetite
EXPOSURE: LaW_2.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3518 -0.6054  0.0079  0.6055  6.1516

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.2984    1.1395
Residual                   0.8021    0.8956
Number of obs: 4954, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  3.870866   0.357065  10.841
log_within   0.005526   0.007168   0.771
log_between  0.032390   0.072192   0.449
sexM         0.261875   0.200676   1.305
age         -0.002272   0.006244  -0.364
ms          -0.025372   0.014770  -1.718

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within  0.016
log_between -0.684 -0.001
sexM        -0.114  0.002 -0.018
age         -0.681 -0.004  0.072 -0.052
ms          -0.249 -0.064  0.014 -0.032  0.068

Robustness weights for the residuals:
3902 weights are ~= 1. The remaining 1052 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.212  0.610  0.781  0.749  0.917  0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.453  0.652  0.814  0.775  0.918  0.992

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4947) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.87 | 0.36 | [ 3.17, 4.57] | 10.84 | < .001
log within | 5.53e-03 | 7.17e-03 | [-0.01, 0.02] | 0.77 | 0.441
log between | 0.03 | 0.07 | [-0.11, 0.17] | 0.45 | 0.654
sex [M] | 0.26 | 0.20 | [-0.13, 0.66] | 1.30 | 0.192
age | -2.27e-03 | 6.24e-03 | [-0.01, 0.01] | -0.36 | 0.716
ms | -0.03 | 0.01 | [-0.05, 0.00] | -1.72 | 0.086

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.14
SD (Residual) | 0.90

```



```

=====
OUTCOME: appetite
EXPOSURE: LaW_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3457 -0.6035  0.0085  0.6036  6.1509

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.308     1.1438
Residual                   0.804     0.8967
Number of obs: 4961, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  3.834527   0.331443  11.569
log_within   0.003993   0.006569   0.608
log_between  0.041855   0.065127   0.643
sexM         0.261451   0.201436   1.298
age         -0.001598   0.006280  -0.254
ms          -0.025093   0.014671  -1.710

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.015
log_between -0.616  0.000
sexM        -0.121  0.002 -0.025
age         -0.742 -0.003  0.100 -0.053
ms          -0.265 -0.058  0.012 -0.031  0.068

Robustness weights for the residuals:
3910 weights are ~= 1. The remaining 1051 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.212  0.609   0.780   0.747  0.916   0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.456  0.655   0.808   0.774  0.898   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4954) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.83 | 0.33 | [ 3.18, 4.48] | 11.57 | < .001
log within | 3.99e-03 | 6.57e-03 | [-0.01, 0.02] | 0.61 | 0.543
log between | 0.04 | 0.07 | [-0.09, 0.17] | 0.64 | 0.520
sex [M] | 0.26 | 0.20 | [-0.13, 0.66] | 1.30 | 0.194
age | -1.60e-03 | 6.28e-03 | [-0.01, 0.01] | -0.25 | 0.799
ms | -0.03 | 0.01 | [-0.05, 0.00] | -1.71 | 0.087

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.14
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_3.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3218 -0.6023  0.0124  0.6072  6.1490

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3079    1.1437
Residual                   0.8061    0.8979
Number of obs: 4934, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.027674   0.391645  10.284
log_within   0.002007   0.008457   0.237
log_between -0.018921   0.080105  -0.236
sexM         0.265525   0.201522   1.318
age         -0.002389   0.006253  -0.382
ms          -0.022162   0.015133  -1.464

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within   0.013
log_between -0.743 -0.002
sexM         -0.088  0.002 -0.036
age         -0.600 -0.003  0.027 -0.052
ms          -0.242 -0.053  0.025 -0.032  0.069

Robustness weights for the residuals:
3878 weights are ~= 1. The remaining 1056 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.213  0.615   0.783   0.751  0.918   0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.452  0.643   0.817   0.775  0.939   0.992

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4927) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.03 | 0.39 | [ 3.26, 4.80] | 10.28 | < .001
log within | 2.01e-03 | 8.46e-03 | [-0.01, 0.02] | 0.24 | 0.812
log between | -0.02 | 0.08 | [-0.18, 0.14] | -0.24 | 0.813
sex [M] | 0.27 | 0.20 | [-0.13, 0.66] | 1.32 | 0.188
age | -2.39e-03 | 6.25e-03 | [-0.01, 0.01] | -0.38 | 0.702
ms | -0.02 | 0.02 | [-0.05, 0.01] | -1.46 | 0.143

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.14
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3523 -0.6049  0.0092  0.6033  6.1562

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3121   1.1455
Residual                   0.8038   0.8966
Number of obs: 4946, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.965913   0.375803  10.553
log_within    0.002408   0.007791   0.309
log_between   0.006674   0.076222   0.088
sexM          0.262153   0.201777   1.299
age          -0.002378   0.006268  -0.379
ms           -0.027815   0.014856  -1.872

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within   0.014
log_between -0.717 -0.001
sexM         -0.098  0.002 -0.031
age          -0.642 -0.003  0.053 -0.052
ms           -0.242 -0.061  0.018 -0.032  0.068

Robustness weights for the residuals:
3888 weights are ~= 1. The remaining 1058 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.212  0.613   0.782   0.750   0.919   0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.455  0.651   0.831   0.788   0.939   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4939) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.97 | 0.38 | [ 3.23, 4.70] | 10.55 | < .001
log within | 2.41e-03 | 7.79e-03 | [-0.01, 0.02] | 0.31 | 0.757
log between | 6.67e-03 | 0.08 | [-0.14, 0.16] | 0.09 | 0.930
sex [M] | 0.26 | 0.20 | [-0.13, 0.66] | 1.30 | 0.194
age | -2.38e-03 | 6.27e-03 | [-0.01, 0.01] | -0.38 | 0.704
ms | -0.03 | 0.01 | [-0.06, 0.00] | -1.87 | 0.061

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_4.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3312 -0.6027  0.0123  0.6066  6.1652

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3292    1.1529
Residual                   0.8026    0.8959
Number of obs: 4877, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.115154   0.422285   9.745
log_within   0.001262   0.009520   0.133
log_between -0.057019   0.087918  -0.649
sexM         0.295258   0.203105   1.454
age          -0.001390   0.006302  -0.221
ms           -0.019273   0.015719  -1.226

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within  0.009
log_between -0.780 -0.001
sexM        -0.090  0.001 -0.022
age         -0.519 -0.002 -0.029 -0.050
ms          -0.238 -0.040  0.034 -0.036  0.065

Robustness weights for the residuals:
3835 weights are ~= 1. The remaining 1042 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.212  0.614   0.780   0.750  0.914   0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.454  0.657   0.849   0.789  0.936   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4870) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.12 | 0.42 | [ 3.29, 4.94] | 9.74 | < .001
log within | 1.26e-03 | 9.52e-03 | [-0.02, 0.02] | 0.13 | 0.895
log between | -0.06 | 0.09 | [-0.23, 0.12] | -0.65 | 0.517
sex [M] | 0.30 | 0.20 | [-0.10, 0.69] | 1.45 | 0.146
age | -1.39e-03 | 6.30e-03 | [-0.01, 0.01] | -0.22 | 0.825
ms | -0.02 | 0.02 | [-0.05, 0.01] | -1.23 | 0.220

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_4
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3336 -0.6030  0.0101  0.6057  6.1575

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3336    1.155
Residual                   0.8027    0.896
Number of obs: 4906, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.074135   0.411543   9.900
log_within   0.005358   0.009047   0.592
log_between -0.041573   0.084917  -0.490
sexM         0.291341   0.203415   1.432
age         -0.001635   0.006309  -0.259
ms          -0.021699   0.015422  -1.407

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within  0.011
log_between -0.766 -0.001
sexM        -0.091  0.002 -0.026
age         -0.558 -0.003  0.002 -0.051
ms          -0.235 -0.049  0.028 -0.035  0.066

Robustness weights for the residuals:
3852 weights are ~= 1. The remaining 1054 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.212  0.614   0.781   0.751  0.918   0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.458  0.657   0.857   0.796  0.948   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4899) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.07 | 0.41 | [ 3.27, 4.88] | 9.90 | < .001
log within | 5.36e-03 | 9.05e-03 | [-0.01, 0.02] | 0.59 | 0.554
log between | -0.04 | 0.08 | [-0.21, 0.12] | -0.49 | 0.624
sex [M] | 0.29 | 0.20 | [-0.11, 0.69] | 1.43 | 0.152
age | -1.63e-03 | 6.31e-03 | [-0.01, 0.01] | -0.26 | 0.796
ms | -0.02 | 0.02 | [-0.05, 0.01] | -1.41 | 0.159

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_5.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.2602 -0.5971  0.0143  0.6015  6.0971

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3182    1.1481
Residual                   0.8171    0.9039
Number of obs: 4761, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.150955   0.448549   9.254
log_within   0.005035   0.010781   0.467
log_between -0.081510   0.093376  -0.873
sexM         0.292171   0.202686   1.441
age         -0.001096   0.006291  -0.174
ms          -0.006997   0.016877  -0.415

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within  0.001
log_between -0.806  0.000
sexM        -0.102  0.000  0.002
age         -0.478  0.000 -0.040 -0.049
ms          -0.243 -0.006  0.042 -0.035  0.065

Robustness weights for the residuals:
3744 weights are ~= 1. The remaining 1017 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.215  0.621  0.784  0.752  0.918  0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.517  0.654  0.815  0.785  0.930  0.991

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4754) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.15 | 0.45 | [ 3.27, 5.03] | 9.25 | < .001
log within | 5.04e-03 | 0.01 | [-0.02, 0.03] | 0.47 | 0.640
log between | -0.08 | 0.09 | [-0.26, 0.10] | -0.87 | 0.383
sex [M] | 0.29 | 0.20 | [-0.11, 0.69] | 1.44 | 0.150
age | -1.10e-03 | 6.29e-03 | [-0.01, 0.01] | -0.17 | 0.862
ms | -7.00e-03 | 0.02 | [-0.04, 0.03] | -0.41 | 0.678

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.2903 -0.5999  0.0150  0.6025  6.1272

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3248    1.1510
Residual                   0.8098    0.8999
Number of obs: 4823, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.119926   0.432152   9.534
log_within   0.004875   0.010208   0.478
log_between -0.062876   0.090064  -0.698
sexM         0.288627   0.202850   1.423
age          -0.001346   0.006299  -0.214
ms           -0.014608   0.016242  -0.899

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.005
log_between -0.790 -0.001
sexM        -0.090  0.001 -0.019
age         -0.495 -0.001 -0.044 -0.050
ms          -0.241 -0.022  0.037 -0.035  0.066

Robustness weights for the residuals:
3787 weights are ~= 1. The remaining 1036 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.214  0.619   0.783   0.752   0.917   0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.447  0.653   0.826   0.781   0.930   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4816) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.12 | 0.43 | [ 3.27, 4.97] | 9.53 | < .001
log within | 4.88e-03 | 0.01 | [-0.02, 0.02] | 0.48 | 0.633
log between | -0.06 | 0.09 | [-0.24, 0.11] | -0.70 | 0.485
sex [M] | 0.29 | 0.20 | [-0.11, 0.69] | 1.42 | 0.155
age | -1.35e-03 | 6.30e-03 | [-0.01, 0.01] | -0.21 | 0.831
ms | -0.01 | 0.02 | [-0.05, 0.02] | -0.90 | 0.368

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_6.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.1634 -0.6017  0.0011  0.6088  6.1559

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3144    1.1465
Residual                   0.8152    0.9029
Number of obs: 4580, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.2100705  0.4383335   9.605
log_within   0.0118975  0.0120698   0.986
log_between -0.1132348  0.0886182  -1.278
sexM         0.2922843  0.2029627   1.440
age         -0.0009699  0.0062906  -0.154
ms           0.0090966  0.0183592   0.495

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.007
log_between -0.792  0.001
sexM        -0.131 -0.001  0.037
age         -0.481  0.002 -0.051 -0.052
ms          -0.257  0.027  0.041 -0.036  0.061

Robustness weights for the residuals:
3614 weights are ~= 1. The remaining 966 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.218  0.618   0.780   0.752   0.915   0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.501  0.676   0.838   0.801   0.961   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4573) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.21 | 0.44 | [ 3.35, 5.07] | 9.60 | < .001
log within | 0.01 | 0.01 | [-0.01, 0.04] | 0.99 | 0.324
log between | -0.11 | 0.09 | [-0.29, 0.06] | -1.28 | 0.201
sex [M] | 0.29 | 0.20 | [-0.11, 0.69] | 1.44 | 0.150
age | -9.70e-04 | 6.29e-03 | [-0.01, 0.01] | -0.15 | 0.877
ms | 9.10e-03 | 0.02 | [-0.03, 0.05] | 0.50 | 0.620

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.15
SD (Residual) | 0.90

```



```

=====
OUTCOME: appetite
EXPOSURE: LaW_6
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.2378 -0.5993  0.0046  0.6085  6.0881

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3052    1.1424
Residual                   0.8165    0.9036
Number of obs: 4678, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.1872940  0.4337530   9.654
log_within   0.0121345  0.0113579   1.068
log_between -0.1045768  0.0879508  -1.189
sexM         0.2882429  0.2019932   1.427
age          -0.0008393  0.0062645  -0.134
ms           0.0043098  0.0175864   0.245

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.001
log_between -0.791  0.000
sexM        -0.117  0.000  0.018
age         -0.491  0.000 -0.043 -0.051
ms          -0.256  0.002  0.043 -0.035  0.063

Robustness weights for the residuals:
3692 weights are ~= 1. The remaining 986 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.216  0.618   0.777   0.750   0.912   0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.506  0.670   0.837   0.798   0.951   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4671) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.19 | 0.43 | [ 3.34, 5.04] | 9.65 | < .001
log within | 0.01 | 0.01 | [-0.01, 0.03] | 1.07 | 0.285
log between | -0.10 | 0.09 | [-0.28, 0.07] | -1.19 | 0.234
sex [M] | 0.29 | 0.20 | [-0.11, 0.68] | 1.43 | 0.154
age | -8.39e-04 | 6.26e-03 | [-0.01, 0.01] | -0.13 | 0.893
ms | 4.31e-03 | 0.02 | [-0.03, 0.04] | 0.25 | 0.806

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.14
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_7.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.2205 -0.6135  0.0005  0.6117  6.2547

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.297     1.1387
Residual                   0.789     0.8882
Number of obs: 4197, groups: id, 170

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.0927302  0.4495233   9.105
log_within   0.0027010  0.0131822   0.205
log_between -0.1175892  0.0903906  -1.301
sexM         0.2694201  0.2030135   1.327
age          -0.0008244  0.0062667  -0.132
ms           0.0485483  0.0206235   2.354

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.008
log_between -0.800  0.001
sexM        -0.123 -0.001  0.032
age         -0.474  0.002 -0.043 -0.053
ms          -0.266  0.030  0.039 -0.038  0.056

Robustness weights for the residuals:
3314 weights are ~= 1. The remaining 883 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.215  0.618  0.776  0.749  0.915  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.490  0.676  0.823  0.783  0.903  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4190) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.09 | 0.45 | [ 3.21, 4.97] | 9.10 | < .001
log within | 2.70e-03 | 0.01 | [-0.02, 0.03] | 0.20 | 0.838
log between | -0.12 | 0.09 | [-0.29, 0.06] | -1.30 | 0.193
sex [M] | 0.27 | 0.20 | [-0.13, 0.67] | 1.33 | 0.185
age | -8.24e-04 | 6.27e-03 | [-0.01, 0.01] | -0.13 | 0.895
ms | 0.05 | 0.02 | [ 0.01, 0.09] | 2.35 | 0.019

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.14
SD (Residual) | 0.89

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_7
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.2033 -0.6073  0.0063  0.6098  6.2089

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3030    1.1415
Residual                   0.8044    0.8969
Number of obs: 4426, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.237154   0.442551   9.574
log_within   0.008058   0.012658   0.637
log_between -0.113562   0.088909  -1.277
sexM         0.294317   0.202909   1.450
age         -0.001577   0.006273  -0.251
ms           0.013842   0.019265   0.719

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.007
log_between -0.796  0.001
sexM        -0.130 -0.001  0.038
age         -0.479  0.002 -0.046 -0.053
ms          -0.258  0.024  0.038 -0.036  0.057

Robustness weights for the residuals:
3490 weights are ~= 1. The remaining 936 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.217  0.617   0.784   0.752  0.913   0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.500  0.660   0.822   0.781  0.903   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4419) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.24 | 0.44 | [ 3.37, 5.10] | 9.57 | < .001
log within | 8.06e-03 | 0.01 | [-0.02, 0.03] | 0.64 | 0.524
log between | -0.11 | 0.09 | [-0.29, 0.06] | -1.28 | 0.202
sex [M] | 0.29 | 0.20 | [-0.10, 0.69] | 1.45 | 0.147
age | -1.58e-03 | 6.27e-03 | [-0.01, 0.01] | -0.25 | 0.802
ms | 0.01 | 0.02 | [-0.02, 0.05] | 0.72 | 0.472

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.14
SD (Residual) | 0.90

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_8
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.1462 -0.6110  0.0068  0.5991  6.3377

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3455    1.160
Residual                   0.7815    0.884
Number of obs: 3836, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.1050176  0.4527714   9.066
log_within   0.0012152  0.0141393   0.086
log_between -0.1557349  0.0905999  -1.719
sexM         0.2481123  0.2100076   1.181
age          0.0004999  0.0064148   0.078
ms           0.0693112  0.0228997   3.027

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.012
log_between -0.788  0.002
sexM        -0.131 -0.002  0.047
age         -0.479  0.003 -0.048 -0.064
ms          -0.278  0.044  0.037 -0.032  0.052

Robustness weights for the residuals:
3038 weights are ~= 1. The remaining 798 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.212  0.608   0.767   0.741  0.902   0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.485  0.660   0.793   0.774  0.885   0.994

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3829) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.11 | 0.45 | [ 3.22, 4.99] | 9.07 | < .001
log within | 1.22e-03 | 0.01 | [-0.03, 0.03] | 0.09 | 0.932
log between | -0.16 | 0.09 | [-0.33, 0.02] | -1.72 | 0.086
sex [M] | 0.25 | 0.21 | [-0.16, 0.66] | 1.18 | 0.237
age | 5.00e-04 | 6.41e-03 | [-0.01, 0.01] | 0.08 | 0.938
ms | 0.07 | 0.02 | [ 0.02, 0.11] | 3.03 | 0.002

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.16
SD (Residual) | 0.88

```

```

=====
OUTCOME: appetite
EXPOSURE: LaW_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.0698 -0.6151  0.0065   0.6063   6.0755

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3638    1.1678
Residual                   0.8091    0.8995
Number of obs: 4069, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.729958   0.455370   8.191
log_within    0.003831   0.014886   0.257
log_between  -0.071330   0.092628  -0.770
sexM          0.276297   0.209505   1.319
age          -0.001168   0.006363  -0.184
ms            0.084299   0.021590   3.904

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.005
log_between -0.796  0.000
sexM        -0.109  0.001  0.009
age         -0.504 -0.001 -0.015 -0.050
ms          -0.244 -0.023  0.028 -0.037  0.056

Robustness weights for the residuals:
3202 weights are ~= 1. The remaining 867 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.221  0.612   0.767   0.749   0.920   0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 27 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.394  0.630   0.807   0.775   0.908   0.972

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4062) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.73 | 0.46 | [ 2.84, 4.62] | 8.19 | < .001
log within | 3.83e-03 | 0.01 | [-0.03, 0.03] | 0.26 | 0.797
log between | -0.07 | 0.09 | [-0.25, 0.11] | -0.77 | 0.441
sex [M] | 0.28 | 0.21 | [-0.13, 0.69] | 1.32 | 0.187
age | -1.17e-03 | 6.36e-03 | [-0.01, 0.01] | -0.18 | 0.854
ms | 0.08 | 0.02 | [ 0.04, 0.13] | 3.90 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.17
SD (Residual) | 0.90

```

```
=====
OUTCOME: concentration
EXPOSURE: DAY_10_11
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1211 -0.5920 0.0355 0.5975 6.8013

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.885 1.373
Residual 1.391 1.179
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.954017 0.346390 11.415
log_within 0.041260 0.007974 5.174
log_between 0.103532 0.055433 1.868
sexM 0.291778 0.241523 1.208
age 0.032163 0.007703 4.175
wakeupTime_dec -0.058372 0.014973 -3.899

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.180
log_between -0.320 0.054
sexM -0.183 -0.004 0.069
age -0.664 0.011 -0.287 -0.062
wakeupTm_dc -0.460 0.392 0.137 -0.010 0.027

Robustness weights for the residuals:
4431 weights are ~= 1. The remaining 1229 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.166 0.583 0.755 0.728 0.909 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.373 0.593 0.781 0.748 0.911 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	3.95	0.35	[3.27, 4.63]	11.41	< .001
log within	0.04	7.97e-03	[0.03, 0.06]	5.17	< .001
log between	0.10	0.06	[-0.01, 0.21]	1.87	0.062
sex [M]	0.29	0.24	[-0.18, 0.77]	1.21	0.227
age	0.03	7.70e-03	[0.02, 0.05]	4.18	< .001
wakeupTime dec	-0.06	0.01	[-0.09, -0.03]	-3.90	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: DAY_11_12
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1628 -0.5875 0.0335 0.5892 6.7129

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.873 1.369
Residual 1.383 1.176
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.921664 0.381513 10.279
log_within 0.041351 0.008812 4.693
log_between 0.109055 0.065246 1.671
sexM 0.265706 0.240326 1.106
age 0.033122 0.007571 4.375
wakeupTime_dec -0.069111 0.014391 -4.802

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.132
log_between -0.524 0.037
sexM -0.164 -0.005 0.034
age -0.568 0.011 -0.238 -0.050
wakeupTm_dc -0.427 0.308 0.120 -0.015 0.037

Robustness weights for the residuals:
4423 weights are ~= 1. The remaining 1237 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.585 0.753 0.728 0.905 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.372 0.591 0.735 0.733 0.874 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	3.92	0.38	[3.17, 4.67]	10.28	< .001
log within	0.04	8.81e-03	[0.02, 0.06]	4.69	< .001
log between	0.11	0.07	[-0.02, 0.24]	1.67	0.095
sex [M]	0.27	0.24	[-0.21, 0.74]	1.11	0.269
age	0.03	7.57e-03	[0.02, 0.05]	4.37	< .001
wakeupTime dec	-0.07	0.01	[-0.10, -0.04]	-4.80	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: DAY_12_13
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1465 -0.5978 0.0283 0.5914 6.5782

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.878 1.370
Residual 1.383 1.176
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.905484 0.439602 8.884
log_within 0.037489 0.009821 3.817
log_between 0.108134 0.080254 1.347
sexM 0.278936 0.240735 1.159
age 0.034315 0.007489 4.582
wakeupTime_dec -0.076286 0.014017 -5.442

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.080
log_between -0.676 0.022
sexM -0.158 -0.003 0.045
age -0.483 0.009 -0.185 -0.051
wakeupTm_dc -0.381 0.211 0.106 -0.013 0.044

Robustness weights for the residuals:
4432 weights are ~= 1. The remaining 1229 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.592 0.747 0.727 0.901 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.381 0.582 0.694 0.718 0.890 0.988

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.91	0.44	[3.04, 4.77]	8.88	< .001
log within	0.04	9.82e-03	[0.02, 0.06]	3.82	< .001
log between	0.11	0.08	[-0.05, 0.27]	1.35	0.178
sex [M]	0.28	0.24	[-0.19, 0.75]	1.16	0.247
age	0.03	7.49e-03	[0.02, 0.05]	4.58	< .001
wakeupTime dec	-0.08	0.01	[-0.10, -0.05]	-5.44	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18


```
=====
OUTCOME: concentration
EXPOSURE: DAY_13_14
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2553 -0.5976 0.0273 0.5881 6.5205

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.881 1.372
Residual 1.373 1.172
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.947556 0.507359 7.781
log_within 0.042659 0.009678 4.408
log_between 0.112848 0.098048 1.151
sexM 0.283663 0.241035 1.177
age 0.034354 0.007449 4.612
wakeupTime_dec -0.085112 0.013771 -6.181

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.047
log_between -0.771 0.011
sexM -0.154 -0.002 0.057
age -0.415 0.008 -0.149 -0.051
wakeupTm_dc -0.324 0.145 0.078 -0.014 0.052

Robustness weights for the residuals:
4431 weights are ~= 1. The remaining 1228 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.163 0.585 0.747 0.726 0.902 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.369 0.585 0.714 0.725 0.879 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	3.95	0.51	[2.95, 4.94]	7.78	< .001
log within	0.04	9.68e-03	[0.02, 0.06]	4.41	< .001
log between	0.11	0.10	[-0.08, 0.31]	1.15	0.250
sex [M]	0.28	0.24	[-0.19, 0.76]	1.18	0.239
age	0.03	7.45e-03	[0.02, 0.05]	4.61	< .001
wakeupTime dec	-0.09	0.01	[-0.11, -0.06]	-6.18	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.17

```
=====
OUTCOME: concentration
EXPOSURE: DAY_14_15
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1294 -0.5970 0.0302 0.5907 6.5064

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.886 1.373
Residual 1.377 1.173
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.127379 0.528581 7.808
log_within 0.050343 0.008873 5.674
log_between 0.075747 0.101463 0.747
sexM 0.283382 0.241770 1.172
age 0.034701 0.007392 4.695
wakeupTime_dec -0.088872 0.013693 -6.490

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.025
log_between -0.791 0.004
sexM -0.171 -0.001 0.082
age -0.460 0.005 -0.067 -0.049
wakeupTm_dc -0.289 0.088 0.044 -0.014 0.061

Robustness weights for the residuals:
4427 weights are ~= 1. The remaining 1232 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.582 0.747 0.727 0.901 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.383 0.595 0.727 0.722 0.877 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	4.13	0.53	[3.09, 5.16]	7.81	< .001
log within	0.05	8.87e-03	[0.03, 0.07]	5.67	< .001
log between	0.08	0.10	[-0.12, 0.27]	0.75	0.455
sex [M]	0.28	0.24	[-0.19, 0.76]	1.17	0.241
age	0.03	7.39e-03	[0.02, 0.05]	4.69	< .001
wakeupTime dec	-0.09	0.01	[-0.12, -0.06]	-6.49	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.17

```
=====
OUTCOME: concentration
EXPOSURE: DAY_15_16
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.3155 -0.5987 0.0325 0.5976 6.4756

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.885 1.373
Residual 1.379 1.174
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.920307 0.515180 7.610
log_within 0.053669 0.008758 6.128
log_between 0.125917 0.095890 1.313
sexM 0.265467 0.241051 1.101
age 0.035392 0.007375 4.799
wakeupTime_dec -0.089178 0.013684 -6.517

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.020
log_between -0.779 0.003
sexM -0.137 -0.001 0.036
age -0.540 0.004 0.016 -0.043
wakeupTm_dc -0.298 0.069 0.049 -0.016 0.065

Robustness weights for the residuals:
4425 weights are ~= 1. The remaining 1234 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.162 0.590 0.745 0.727 0.902 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.369 0.592 0.726 0.730 0.909 0.991

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	3.92	0.52	[2.91, 4.93]	7.61	< .001
log within	0.05	8.76e-03	[0.04, 0.07]	6.13	< .001
log between	0.13	0.10	[-0.06, 0.31]	1.31	0.189
sex [M]	0.27	0.24	[-0.21, 0.74]	1.10	0.271
age	0.04	7.37e-03	[0.02, 0.05]	4.80	< .001
wakeupTime dec	-0.09	0.01	[-0.12, -0.06]	-6.52	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.17

```
=====
OUTCOME: concentration
EXPOSURE: DAY_16_17
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.3283 -0.5827 0.0299 0.5959 6.5392

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.884 1.372
Residual 1.375 1.173
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.85047 0.48912 7.872
log_within 0.05818 0.00890 6.537
log_between 0.16093 0.10093 1.594
sexM 0.23456 0.24122 0.972
age 0.03501 0.00737 4.750
wakeupTime_dec -0.08703 0.01363 -6.386

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.021
log_between -0.751 0.003
sexM -0.070 -0.002 -0.060
age -0.556 0.004 0.000 -0.043
wakeupTm_dc -0.304 0.070 0.041 -0.020 0.065

Robustness weights for the residuals:
4437 weights are ~= 1. The remaining 1224 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.161 0.584 0.747 0.725 0.900 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.369 0.602 0.776 0.761 0.968 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.85	0.49	[2.89, 4.81]	7.87	< .001
log within	0.06	8.90e-03	[0.04, 0.08]	6.54	< .001
log between	0.16	0.10	[-0.04, 0.36]	1.59	0.111
sex [M]	0.23	0.24	[-0.24, 0.71]	0.97	0.331
age	0.04	7.37e-03	[0.02, 0.05]	4.75	< .001
wakeupTime dec	-0.09	0.01	[-0.11, -0.06]	-6.39	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.17

```
=====
OUTCOME: concentration
EXPOSURE: DAY_17_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2674 -0.5902 0.0292 0.5911 6.4807

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.869 1.367
Residual 1.387 1.178
Number of obs: 5655, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.978065 0.467870 8.502
log_within 0.058414 0.009540 6.123
log_between 0.148921 0.117103 1.272
sexM 0.218444 0.241777 0.903
age 0.035529 0.007351 4.833
wakeupTime_dec -0.085136 0.013698 -6.215

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.017
log_between -0.725 0.001
sexM -0.030 -0.001 -0.123
age -0.609 0.004 0.042 -0.048
wakeupTm_dc -0.306 0.056 0.026 -0.021 0.066

Robustness weights for the residuals:
4418 weights are ~= 1. The remaining 1237 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.163 0.588 0.757 0.731 0.907 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.373 0.582 0.686 0.719 0.909 0.989

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5648)	p
(Intercept)	3.98	0.47	[3.06, 4.90]	8.50	< .001
log within	0.06	9.54e-03	[0.04, 0.08]	6.12	< .001
log between	0.15	0.12	[-0.08, 0.38]	1.27	0.204
sex [M]	0.22	0.24	[-0.26, 0.69]	0.90	0.366
age	0.04	7.35e-03	[0.02, 0.05]	4.83	< .001
wakeupTime dec	-0.09	0.01	[-0.11, -0.06]	-6.22	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: DAY_8_9
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2535 -0.6037 0.0265 0.5966 6.7209

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.838 1.356
Residual 1.382 1.176
Number of obs: 5662, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.139443 0.325192 12.729
log_within 0.041823 0.007416 5.640
log_between 0.152926 0.051395 2.976
sexM 0.352724 0.239493 1.473
age 0.031860 0.007427 4.290
wakeupTime_dec -0.051714 0.015015 -3.444

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.178
log_between 0.019 0.056
sexM -0.166 -0.002 0.112
age -0.820 0.017 -0.192 -0.064
wakeupTm_dc -0.442 0.403 0.138 -0.004 0.043

Robustness weights for the residuals:
4433 weights are ~= 1. The remaining 1229 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.163 0.578 0.754 0.727 0.901 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 38 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.362 0.589 0.838 0.776 0.950 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5655)	p
(Intercept)	4.14	0.33	[3.50, 4.78]	12.73	< .001
log within	0.04	7.42e-03	[0.03, 0.06]	5.64	< .001
log between	0.15	0.05	[0.05, 0.25]	2.98	0.003
sex [M]	0.35	0.24	[-0.12, 0.82]	1.47	0.141
age	0.03	7.43e-03	[0.02, 0.05]	4.29	< .001
wakeupTime dec	-0.05	0.02	[-0.08, -0.02]	-3.44	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: DAY_9_10
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1601 -0.5967 0.0336 0.5973 6.7109

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.884 1.373
Residual 1.379 1.175
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.024627 0.333609 12.064
log_within 0.035946 0.007557 4.757
log_between 0.119025 0.050514 2.356
sexM 0.312764 0.241561 1.295
age 0.031961 0.007606 4.202
wakeupTime_dec -0.056084 0.015346 -3.655

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.206
log_between -0.153 0.064
sexM -0.178 -0.004 0.075
age -0.759 0.015 -0.244 -0.060
wakeupTm_dc -0.464 0.443 0.145 -0.008 0.034

Robustness weights for the residuals:
4436 weights are ~= 1. The remaining 1225 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.586 0.750 0.726 0.901 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.369 0.590 0.795 0.749 0.905 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.02	0.33	[3.37, 4.68]	12.06	< .001
log within	0.04	7.56e-03	[0.02, 0.05]	4.76	< .001
log between	0.12	0.05	[0.02, 0.22]	2.36	0.018
sex [M]	0.31	0.24	[-0.16, 0.79]	1.29	0.195
age	0.03	7.61e-03	[0.02, 0.05]	4.20	< .001
wakeupTime dec	-0.06	0.02	[-0.09, -0.03]	-3.65	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.17

```
=====
OUTCOME: concentration
EXPOSURE: DAY_sunrise_8
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.8822 -0.5969  0.0345  0.5932  6.6841
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.809    1.345
Residual                1.391    1.179
Number of obs: 5661, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   4.738305   0.339625  13.952
log_within     0.011441   0.009818   1.165
log_between    0.185874   0.069435   2.677
sexM           0.323035   0.237803   1.358
age            0.033943   0.007256   4.678
wakeupTime_dec -0.086195   0.014275  -6.038
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.100
log_between 0.333 0.027
sexM        -0.122 -0.002 0.116
age         -0.813 0.016 -0.081 -0.053
wakeupTm_dc -0.374 0.268 0.101 -0.008 0.060
```

```
Robustness weights for the residuals:
4434 weights are ~= 1. The remaining 1227 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.171  0.582   0.751   0.727  0.903   0.999
```

```
Robustness weights for the random effects:
132 weights are ~= 1. The remaining 40 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.363  0.581   0.815   0.776  0.944   0.999
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.74	0.34	[4.07, 5.40]	13.95	< .001
log within	0.01	9.82e-03	[-0.01, 0.03]	1.17	0.244
log between	0.19	0.07	[0.05, 0.32]	2.68	0.007
sex [M]	0.32	0.24	[-0.14, 0.79]	1.36	0.174
age	0.03	7.26e-03	[0.02, 0.05]	4.68	< .001
wakeupTime dec	-0.09	0.01	[-0.11, -0.06]	-6.04	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	1.18


```
=====
OUTCOME: concentration
EXPOSURE: LAN_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.5068 -0.5731 0.0681 0.5718 4.4357

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.106 1.451
Residual 1.221 1.105
Number of obs: 2255, groups: id, 139

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.712759 0.426860 8.698
log_within -0.015977 0.010879 -1.469
log_between -0.018516 0.080933 -0.229
sexM 0.097274 0.301938 0.322
age 0.040720 0.009048 4.501
ms -0.009224 0.042082 -0.219

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.025
log_between 0.372 -0.001
sexM -0.170 -0.003 -0.127
age -0.836 0.004 -0.202 -0.044
ms_dia_sgnt -0.400 0.060 -0.040 -0.025 0.048

Robustness weights for the residuals:
1782 weights are ~= 1. The remaining 473 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.158 0.568 0.744 0.724 0.907 0.999

Robustness weights for the random effects:
112 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.376 0.544 0.772 0.729 0.950 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(2248)	p
(Intercept)	3.71	0.43	[2.88, 4.55]	8.70	< .001
log within	-0.02	0.01	[-0.04, 0.01]	-1.47	0.142
log between	-0.02	0.08	[-0.18, 0.14]	-0.23	0.819
sex [M]	0.10	0.30	[-0.49, 0.69]	0.32	0.747
age	0.04	9.05e-03	[0.02, 0.06]	4.50	< .001
ms	-9.22e-03	0.04	[-0.09, 0.07]	-0.22	0.827

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.45
SD (Residual)	1.11

```
=====
OUTCOME: concentration
EXPOSURE: LAN_1.5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.708 -0.603  0.062   0.574   5.102
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      2.102     1.450
Residual                   1.212     1.101
Number of obs: 3382, groups: id, 151
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.780572   0.364282  10.378
log_within    -0.004427   0.009762  -0.454
log_between    0.017739   0.090351   0.196
sexM           0.110796   0.279296   0.397
age            0.041876   0.008437   4.963
ms            -0.049178   0.029989  -1.640
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.016
log_between  0.077 -0.003
sexM        -0.156  0.000 -0.132
age         -0.854  0.002 -0.082 -0.058
ms_dia_sgnt -0.382  0.046 -0.024 -0.020  0.061
```

```
Robustness weights for the residuals:
2667 weights are ~= 1. The remaining 715 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.154  0.576   0.743   0.725   0.904   0.999
```

```
Robustness weights for the random effects:
122 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.381  0.575   0.784   0.731   0.923   0.994
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3375)	p
(Intercept)	3.78	0.36	[3.07, 4.49]	10.38	< .001
log within	-4.43e-03	9.76e-03	[-0.02, 0.01]	-0.45	0.650
log between	0.02	0.09	[-0.16, 0.19]	0.20	0.844
sex [M]	0.11	0.28	[-0.44, 0.66]	0.40	0.692
age	0.04	8.44e-03	[0.03, 0.06]	4.96	< .001
ms	-0.05	0.03	[-0.11, 0.01]	-1.64	0.101

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.45
SD (Residual)	1.10

```

=====
OUTCOME: concentration
EXPOSURE: LAN_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.6788 -0.5933  0.0634  0.5774  4.4434

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.223     1.491
Residual                   1.222     1.105
Number of obs: 2829, groups: id, 145

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.721924   0.396981   9.376
log_within     -0.006661   0.010062  -0.662
log_between     0.025547   0.088427   0.289
sexM            0.175336   0.294423   0.596
age            0.041007   0.008895   4.610
ms            -0.019619   0.035625  -0.551

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.017
log_between 0.239 -0.002
sexM        -0.163  0.000 -0.097
age         -0.848  0.002 -0.152 -0.055
ms_dia_sgnt -0.385  0.044 -0.029 -0.022  0.049

Robustness weights for the residuals:
2238 weights are ~= 1. The remaining 591 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.155  0.577   0.735   0.723  0.903   0.999

Robustness weights for the random effects:
117 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.390  0.580   0.774   0.735  0.892   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2822) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.72 | 0.40 | [ 2.94, 4.50] | 9.38 | < .001
log within | -6.66e-03 | 0.01 | [-0.03, 0.01] | -0.66 | 0.508
log between | 0.03 | 0.09 | [-0.15, 0.20] | 0.29 | 0.773
sex [M] | 0.18 | 0.29 | [-0.40, 0.75] | 0.60 | 0.552
age | 0.04 | 8.89e-03 | [ 0.02, 0.06] | 4.61 | < .001
ms | -0.02 | 0.04 | [-0.09, 0.05] | -0.55 | 0.582

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.49
SD (Residual) | 1.11

```

```

=====
OUTCOME: concentration
EXPOSURE: LAN_2.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.6002 -0.5894  0.0569  0.5882  6.7122

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      2.089     1.445
Residual                   1.250     1.118
Number of obs: 4093, groups: id, 160

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.975525   0.355704  11.176
log_within     -0.000443   0.010241  -0.043
log_between     0.030312   0.096553   0.314
sexM            0.192756   0.267799   0.720
age            0.040521   0.008252   4.910
ms            -0.106088   0.025468  -4.165

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.016
log_between -0.156 -0.003
sexM        -0.142  0.000 -0.107
age         -0.850  0.003  0.000 -0.056
ms_dia_sgnt -0.360  0.048 -0.015 -0.021  0.067

Robustness weights for the residuals:
3227 weights are ~= 1. The remaining 866 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.156  0.580   0.744   0.725  0.898   0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.384  0.567   0.747   0.736  0.926   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4086) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.98 | 0.36 | [ 3.28, 4.67] | 11.18 | < .001
log within | -4.43e-04 | 0.01 | [-0.02, 0.02] | -0.04 | 0.965
log between | 0.03 | 0.10 | [-0.16, 0.22] | 0.31 | 0.754
sex [M] | 0.19 | 0.27 | [-0.33, 0.72] | 0.72 | 0.472
age | 0.04 | 8.25e-03 | [ 0.02, 0.06] | 4.91 | < .001
ms | -0.11 | 0.03 | [-0.16, -0.06] | -4.17 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.45
SD (Residual) | 1.12

```

```

=====
OUTCOME: concentration
EXPOSURE: LAN_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.6281 -0.5965  0.0724  0.5825  5.0306

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      2.164    1.471
Residual                   1.235    1.111
Number of obs: 3762, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.754819   0.362668  10.353
log_within    0.007034   0.010015   0.702
log_between  -0.034342   0.091314  -0.376
sexM          0.244453   0.279704   0.874
age           0.043135   0.008473   5.091
ms           -0.071935   0.027701  -2.597

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.023
log_between -0.061 -0.004
sexM        -0.139 -0.001 -0.107
age         -0.855  0.003 -0.023 -0.068
ms_dia_sgnt -0.366  0.067 -0.030 -0.014  0.061

Robustness weights for the residuals:
2973 weights are ~= 1. The remaining 789 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.156  0.582   0.734   0.724  0.898   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.390  0.597   0.793   0.761  0.956   0.991

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3755) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.75 | 0.36 | [ 3.04, 4.47] | 10.35 | < .001
log within | 7.03e-03 | 0.01 | [-0.01, 0.03] | 0.70 | 0.483
log between | -0.03 | 0.09 | [-0.21, 0.14] | -0.38 | 0.707
sex [M] | 0.24 | 0.28 | [-0.30, 0.79] | 0.87 | 0.382
age | 0.04 | 8.47e-03 | [ 0.03, 0.06] | 5.09 | < .001
ms | -0.07 | 0.03 | [-0.13, -0.02] | -2.60 | 0.009

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.47
SD (Residual) | 1.11

```

```
=====
OUTCOME: concentration
EXPOSURE: LAN_20_21
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2848 -0.5869 0.0322 0.5993 6.6743

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.963 1.401
Residual 1.328 1.153
Number of obs: 5092, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.376578 0.402805 8.383
log_within 0.017233 0.011155 1.545
log_between 0.152980 0.121567 1.258
sexM 0.221998 0.250407 0.887
age 0.038564 0.007649 5.042
wakeupTime_dec -0.012265 0.014283 -0.859

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.004
log_between -0.562 0.000
sexM -0.075 -0.001 -0.110
age -0.759 -0.002 0.125 -0.066
wakeupTm_dc -0.346 0.017 -0.002 -0.021 0.065

Robustness weights for the residuals:
3980 weights are ~= 1. The remaining 1112 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.162 0.587 0.752 0.730 0.910 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.372 0.538 0.660 0.698 0.909 0.992

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5085)	p
(Intercept)	3.38	0.40	[2.59, 4.17]	8.38	< .001
log within	0.02	0.01	[0.00, 0.04]	1.54	0.122
log between	0.15	0.12	[-0.09, 0.39]	1.26	0.208
sex [M]	0.22	0.25	[-0.27, 0.71]	0.89	0.375
age	0.04	7.65e-03	[0.02, 0.05]	5.04	< .001
wakeupTime dec	-0.01	0.01	[-0.04, 0.02]	-0.86	0.391

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.40
SD (Residual)	1.15

```
=====
OUTCOME: concentration
EXPOSURE: LAN_21_22
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.2936 -0.5799  0.0319  0.6022  6.7188
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.993     1.412
Residual                   1.325     1.151
Number of obs: 5106, groups: id, 168
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.606315   0.373656   9.651
log_within    0.013795   0.010621   1.299
log_between   0.036690   0.105858   0.347
sexM          0.249921   0.253876   0.984
age           0.037700   0.007699   4.897
wakeupTime_dec -0.012242  0.014330  -0.854
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.001
log_between -0.441 -0.004
sexM        -0.078 -0.001 -0.157
age         -0.800 -0.001  0.118 -0.071
wakeupTm_dc -0.364  0.012 -0.027 -0.017  0.063
```

```
Robustness weights for the residuals:
4005 weights are ~= 1. The remaining 1101 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.162  0.584   0.745   0.725  0.905   0.999
```

```
Robustness weights for the random effects:
135 weights are ~= 1. The remaining 33 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.389  0.551   0.684   0.719  0.911   0.996
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5099)	p
(Intercept)	3.61	0.37	[2.87, 4.34]	9.65	< .001
log within	0.01	0.01	[-0.01, 0.03]	1.30	0.194
log between	0.04	0.11	[-0.17, 0.24]	0.35	0.729
sex [M]	0.25	0.25	[-0.25, 0.75]	0.98	0.325
age	0.04	7.70e-03	[0.02, 0.05]	4.90	< .001
wakeupTime dec	-0.01	0.01	[-0.04, 0.02]	-0.85	0.393

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.41
SD (Residual)	1.15

```
=====
OUTCOME: concentration
EXPOSURE: LAN_22_23
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.3028 -0.5833  0.0297  0.6023  6.7084
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  2.006   1.416
Residual                1.325   1.151
Number of obs: 5101, groups: id, 168
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.734317   0.342650  10.898
log_within     -0.005019   0.009053  -0.554
log_between    -0.133308   0.082536  -1.615
sexM            0.355841   0.257066   1.384
age             0.036935   0.007727   4.780
wakeupTime_dec -0.009869   0.014347  -0.688
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.002
log_between -0.193 -0.001
sexM        -0.120  0.001 -0.207
age         -0.842 -0.001  0.123 -0.077
wakeupTm_dc -0.396  0.005 -0.065 -0.007  0.058
```

```
Robustness weights for the residuals:
4006 weights are ~= 1. The remaining 1095 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.162  0.586   0.742   0.725  0.905   0.999
```

```
Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.405  0.565   0.732   0.716  0.903   0.988
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5094)	p
(Intercept)	3.73	0.34	[3.06, 4.41]	10.90	< .001
log within	-5.02e-03	9.05e-03	[-0.02, 0.01]	-0.55	0.579
log between	-0.13	0.08	[-0.30, 0.03]	-1.62	0.106
sex [M]	0.36	0.26	[-0.15, 0.86]	1.38	0.166
age	0.04	7.73e-03	[0.02, 0.05]	4.78	< .001
wakeupTime dec	-9.87e-03	0.01	[-0.04, 0.02]	-0.69	0.492

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.42
SD (Residual)	1.15


```
=====
OUTCOME: concentration
EXPOSURE: LAN_23_0
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2731 -0.5923 0.0329 0.5970 6.6774

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.977 1.406
Residual 1.329 1.153
Number of obs: 5096, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.565857 0.335486 10.629
log_within -0.024047 0.008398 -2.864
log_between -0.129809 0.069643 -1.864
sexM 0.404837 0.258232 1.568
age 0.036864 0.007663 4.810
wakeupTime_dec -0.008213 0.014410 -0.570

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between 0.081 0.002
sexM -0.181 0.000 -0.254
age -0.823 -0.004 0.109 -0.079
wakeupTm_dc -0.424 -0.036 -0.098 0.004 0.055

Robustness weights for the residuals:
3993 weights are ~= 1. The remaining 1103 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.163 0.585 0.745 0.728 0.910 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.393 0.565 0.693 0.722 0.937 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5089)	p
(Intercept)	3.57	0.34	[2.91, 4.22]	10.63	< .001
log within	-0.02	8.40e-03	[-0.04, -0.01]	-2.86	0.004
log between	-0.13	0.07	[-0.27, 0.01]	-1.86	0.062
sex [M]	0.40	0.26	[-0.10, 0.91]	1.57	0.117
age	0.04	7.66e-03	[0.02, 0.05]	4.81	< .001
wakeupTime dec	-8.21e-03	0.01	[-0.04, 0.02]	-0.57	0.569

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.41
SD (Residual)	1.15

```

=====
OUTCOME: concentration
EXPOSURE: LAN_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.5165 -0.5990  0.0551  0.5867  6.5985

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.995     1.412
Residual                   1.276     1.130
Number of obs: 4262, groups: id, 164

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.054351   0.346915  11.687
log_within     -0.005936   0.010987  -0.540
log_between     0.047678   0.095931   0.497
sexM            0.177781   0.259295   0.686
age            0.039499   0.007920   4.988
ms            -0.117505   0.024254  -4.845

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.025
log_between -0.223 -0.004
sexM        -0.121  0.000 -0.098
age         -0.838  0.005  0.006 -0.074
ms_dia_sgnt -0.361  0.071 -0.025 -0.022  0.072

Robustness weights for the residuals:
3359 weights are ~= 1. The remaining 903 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.576   0.741   0.724   0.896   0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.376  0.562   0.696   0.723   0.909   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4255) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.05 | 0.35 | [ 3.37, 4.73] | 11.69 | < .001
log within | -5.94e-03 | 0.01 | [-0.03, 0.02] | -0.54 | 0.589
log between | 0.05 | 0.10 | [-0.14, 0.24] | 0.50 | 0.619
sex [M] | 0.18 | 0.26 | [-0.33, 0.69] | 0.69 | 0.493
age | 0.04 | 7.92e-03 | [ 0.02, 0.06] | 4.99 | < .001
ms | -0.12 | 0.02 | [-0.17, -0.07] | -4.84 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.41
SD (Residual) | 1.13

```

```

=====
OUTCOME: concentration
EXPOSURE: LAN_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.5241 -0.5879  0.0411  0.5962  6.5832

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.896     1.377
Residual                   1.272     1.128
Number of obs: 4809, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.133003   0.380945  10.849
log_within     0.042079   0.015559   2.704
log_between    0.075356   0.118344   0.637
sexM           0.233800   0.247651   0.944
age            0.037442   0.007646   4.897
ms            -0.135816   0.018705  -7.261

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.003
log_between  -0.547 -0.001
sexM          -0.101  0.001 -0.053
age          -0.781 -0.001  0.108 -0.075
ms_dia_sgnt -0.271  0.000 -0.021 -0.035  0.076

Robustness weights for the residuals:
3781 weights are ~= 1. The remaining 1028 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.569  0.739  0.721  0.898  0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.369  0.566  0.745  0.730  0.897  0.995

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4802) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.13 | 0.38 | [ 3.39, 4.88] | 10.85 | < .001
log within | 0.04 | 0.02 | [ 0.01, 0.07] | 2.70 | 0.007
log between | 0.08 | 0.12 | [-0.16, 0.31] | 0.64 | 0.524
sex [M] | 0.23 | 0.25 | [-0.25, 0.72] | 0.94 | 0.345
age | 0.04 | 7.65e-03 | [ 0.02, 0.05] | 4.90 | < .001
ms | -0.14 | 0.02 | [-0.17, -0.10] | -7.26 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.38
SD (Residual) | 1.13

```

```
=====
OUTCOME: concentration
EXPOSURE: LAN_sunset_20
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2935 -0.5841 0.0323 0.5985 6.7197

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.982 1.408
Residual 1.323 1.150
Number of obs: 5099, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.417851 0.422710 8.086
log_within 0.037406 0.012352 3.028
log_between 0.119986 0.134963 0.889
sexM 0.259246 0.250105 1.037
age 0.038002 0.007654 4.965
wakeupTime_dec -0.010335 0.014314 -0.722

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.012
log_between -0.611 0.000
sexM -0.137 -0.001 0.010
age -0.715 0.002 0.087 -0.052
wakeupTm_dc -0.338 0.037 0.010 -0.021 0.067

Robustness weights for the residuals:
3994 weights are ~= 1. The remaining 1105 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.162 0.581 0.746 0.727 0.908 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.384 0.549 0.666 0.708 0.909 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5092)	p
(Intercept)	3.42	0.42	[2.59, 4.25]	8.09	< .001
log within	0.04	0.01	[0.01, 0.06]	3.03	0.002
log between	0.12	0.13	[-0.14, 0.38]	0.89	0.374
sex [M]	0.26	0.25	[-0.23, 0.75]	1.04	0.300
age	0.04	7.65e-03	[0.02, 0.05]	4.97	< .001
wakeupTime dec	-0.01	0.01	[-0.04, 0.02]	-0.72	0.470

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.41
SD (Residual)	1.15

```
=====
OUTCOME: concentration
EXPOSURE: LAN_0_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1916 -0.5981 0.0338 0.5944 6.6792

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.883 1.372
Residual 1.390 1.179
Number of obs: 5657, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.214657 0.342081 12.321
log_within -0.029052 0.008745 -3.322
log_between -0.106283 0.072087 -1.474
sexM 0.335735 0.244348 1.374
age 0.034582 0.007416 4.663
wakeupTime_dec -0.081156 0.014041 -5.780

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.082
log_between 0.319 0.022
sexM -0.216 0.000 -0.169
age -0.757 -0.010 0.109 -0.061
wakeupTm_dc -0.434 -0.189 -0.115 0.002 0.053

Robustness weights for the residuals:
4439 weights are ~= 1. The remaining 1218 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.576 0.750 0.726 0.903 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.377 0.585 0.760 0.736 0.910 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5650)	p
(Intercept)	4.21	0.34	[3.54, 4.89]	12.32	< .001
log within	-0.03	8.74e-03	[-0.05, -0.01]	-3.32	< .001
log between	-0.11	0.07	[-0.25, 0.04]	-1.47	0.140
sex [M]	0.34	0.24	[-0.14, 0.81]	1.37	0.169
age	0.03	7.42e-03	[0.02, 0.05]	4.66	< .001
wakeupTime dec	-0.08	0.01	[-0.11, -0.05]	-5.78	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LAN_1_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1478 -0.5980 0.0328 0.5853 6.6913

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.880 1.371
Residual 1.388 1.178
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.146271 0.376227 11.021
log_within -0.035841 0.011030 -3.249
log_between -0.106997 0.083889 -1.275
sexM 0.295494 0.241822 1.222
age 0.034781 0.007417 4.689
wakeupTime_dec -0.084054 0.013953 -6.024

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.066
log_between 0.509 0.016
sexM -0.199 0.001 -0.098
age -0.658 -0.009 0.118 -0.054
wakeupTm_dc -0.411 -0.160 -0.102 -0.008 0.053

Robustness weights for the residuals:
4417 weights are ~= 1. The remaining 1244 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.584 0.753 0.731 0.914 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.378 0.583 0.783 0.739 0.902 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.15	0.38	[3.41, 4.88]	11.02	< .001
log within	-0.04	0.01	[-0.06, -0.01]	-3.25	0.001
log between	-0.11	0.08	[-0.27, 0.06]	-1.28	0.202
sex [M]	0.30	0.24	[-0.18, 0.77]	1.22	0.222
age	0.03	7.42e-03	[0.02, 0.05]	4.69	< .001
wakeupTime dec	-0.08	0.01	[-0.11, -0.06]	-6.02	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LAN_2_3
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.1495 -0.5988  0.0343  0.5855  6.6707
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.876     1.370
Residual                  1.390     1.179
Number of obs: 5661, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.21529    0.41785  10.088
log_within     -0.01244    0.01424  -0.874
log_between    -0.07529    0.09722  -0.774
sexM            0.27595    0.24044   1.148
age            0.03532    0.00739   4.780
wakeupTime_dec -0.08814    0.01403  -6.281
```

```
Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   0.071
log_between  0.632  0.017
sexM         -0.131  0.004  0.007
age          -0.591 -0.010  0.090 -0.042
wakeupTm_dc -0.385 -0.183 -0.093 -0.019  0.057
```

```
Robustness weights for the residuals:
4427 weights are ~= 1. The remaining 1234 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.585   0.751   0.728  0.909   0.999
```

```
Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.377  0.571   0.749   0.730  0.882   0.993
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.22	0.42	[3.40, 5.03]	10.09	< .001
log within	-0.01	0.01	[-0.04, 0.02]	-0.87	0.382
log between	-0.08	0.10	[-0.27, 0.12]	-0.77	0.439
sex [M]	0.28	0.24	[-0.20, 0.75]	1.15	0.251
age	0.04	7.39e-03	[0.02, 0.05]	4.78	< .001
wakeupTime dec	-0.09	0.01	[-0.12, -0.06]	-6.28	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LAN_3_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1524 -0.5972 0.0353 0.5874 6.6906

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.877 1.370
Residual 1.388 1.178
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.063302 0.514469 7.898
log_within -0.048030 0.017266 -2.782
log_between -0.102000 0.131625 -0.775
sexM 0.258183 0.241191 1.070
age 0.035444 0.007374 4.806
wakeupTime_dec -0.082771 0.014039 -5.896

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.051
log_between 0.777 0.011
sexM -0.049 0.004 0.077
age -0.482 -0.010 0.059 -0.039
wakeupTm_dc -0.320 -0.158 -0.069 -0.024 0.062

Robustness weights for the residuals:
4426 weights are ~= 1. The remaining 1235 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.586 0.748 0.729 0.911 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.378 0.575 0.742 0.725 0.882 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.06	0.51	[3.05, 5.07]	7.90	< .001
log within	-0.05	0.02	[-0.08, -0.01]	-2.78	0.005
log between	-0.10	0.13	[-0.36, 0.16]	-0.77	0.438
sex [M]	0.26	0.24	[-0.21, 0.73]	1.07	0.284
age	0.04	7.37e-03	[0.02, 0.05]	4.81	< .001
wakeupTime dec	-0.08	0.01	[-0.11, -0.06]	-5.90	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.18


```
=====
OUTCOME: concentration
EXPOSURE: LAN_4_5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1355 -0.5957  0.0350  0.5873  6.6692
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      1.829    1.353
Residual                   1.396    1.182
Number of obs: 5661, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.985458   0.583421   6.831
log_within    -0.014160   0.021264  -0.666
log_between   -0.137713   0.148538  -0.927
sexM           0.229027   0.240106   0.954
age            0.036185   0.007274   4.975
wakeupTime_dec -0.091118   0.013921  -6.545
```

```
Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.026
log_between   0.836  0.004
sexM           0.029  0.002  0.147
age            -0.481 -0.007 -0.025 -0.047
wakeupTm_dc   -0.265 -0.099 -0.037 -0.024  0.067
```

```
Robustness weights for the residuals:
4432 weights are ~= 1. The remaining 1229 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.581  0.750  0.728  0.907  0.999
```

```
Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.369  0.563  0.745  0.718  0.880  0.987
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.99	0.58	[2.84, 5.13]	6.83	< .001
log within	-0.01	0.02	[-0.06, 0.03]	-0.67	0.505
log between	-0.14	0.15	[-0.43, 0.15]	-0.93	0.354
sex [M]	0.23	0.24	[-0.24, 0.70]	0.95	0.340
age	0.04	7.27e-03	[0.02, 0.05]	4.97	< .001
wakeupTime dec	-0.09	0.01	[-0.12, -0.06]	-6.55	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LAN_5_sunrise
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1594 -0.5962 0.0354 0.5868 6.6266

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.800 1.342
Residual 1.392 1.180
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.423933 0.688183 4.975
log_within -0.045233 0.023872 -1.895
log_between -0.311821 0.183766 -1.697
sexM 0.175028 0.242342 0.722
age 0.037282 0.007266 5.131
wakeupTime_dec -0.094123 0.013802 -6.820

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between 0.887 0.000
sexM 0.129 0.000 0.233
age -0.488 -0.001 -0.117 -0.070
wakeupTm_dc -0.176 -0.007 0.024 -0.013 0.064

Robustness weights for the residuals:
4428 weights are ~= 1. The remaining 1233 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.582 0.750 0.728 0.908 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.365 0.562 0.738 0.721 0.879 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.42	0.69	[2.07, 4.77]	4.98	< .001
log within	-0.05	0.02	[-0.09, 0.00]	-1.89	0.058
log between	-0.31	0.18	[-0.67, 0.05]	-1.70	0.090
sex [M]	0.18	0.24	[-0.30, 0.65]	0.72	0.470
age	0.04	7.27e-03	[0.02, 0.05]	5.13	< .001
wakeupTime dec	-0.09	0.01	[-0.12, -0.07]	-6.82	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1528 -0.6089 0.0210 0.5919 6.7800

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.781 1.335
Residual 1.403 1.185
Number of obs: 4982, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.444588 0.318116 13.972
log_within 0.023221 0.007141 3.252
log_between 0.078443 0.064597 1.214
sexM 0.249329 0.236181 1.056
age 0.035864 0.007387 4.855
ms -0.174603 0.019204 -9.092

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.034
log_between -0.221 0.001
sexM -0.158 0.003 -0.027
age -0.861 -0.006 0.122 -0.055
ms -0.350 -0.099 -0.011 -0.034 0.074

Robustness weights for the residuals:
3909 weights are ~= 1. The remaining 1073 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.588 0.761 0.731 0.908 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.362 0.576 0.725 0.719 0.883 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4975)	p
(Intercept)	4.44	0.32	[3.82, 5.07]	13.97	< .001
log within	0.02	7.14e-03	[0.01, 0.04]	3.25	0.001
log between	0.08	0.06	[-0.05, 0.21]	1.21	0.225
sex [M]	0.25	0.24	[-0.21, 0.71]	1.06	0.291
age	0.04	7.39e-03	[0.02, 0.05]	4.86	< .001
ms	-0.17	0.02	[-0.21, -0.14]	-9.09	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1803 -0.6044 0.0263 0.5985 6.7905

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.744 1.321
Residual 1.405 1.185
Number of obs: 4975, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.978475 0.366256 10.863
log_within 0.031268 0.008066 3.876
log_between 0.202323 0.071936 2.813
sexM 0.274779 0.233731 1.176
age 0.036260 0.007305 4.964
ms -0.173157 0.019136 -9.049

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.019
log_between -0.544 -0.001
sexM -0.137 0.002 -0.007
age -0.780 -0.004 0.113 -0.053
ms -0.309 -0.064 0.007 -0.034 0.077

Robustness weights for the residuals:
3914 weights are ~= 1. The remaining 1061 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.581 0.752 0.728 0.905 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.355 0.548 0.723 0.712 0.906 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4968)	p
(Intercept)	3.98	0.37	[3.26, 4.70]	10.86	< .001
log within	0.03	8.07e-03	[0.02, 0.05]	3.88	< .001
log between	0.20	0.07	[0.06, 0.34]	2.81	0.005
sex [M]	0.27	0.23	[-0.18, 0.73]	1.18	0.240
age	0.04	7.31e-03	[0.02, 0.05]	4.96	< .001
ms	-0.17	0.02	[-0.21, -0.14]	-9.05	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.19

```
=====
OUTCOME: concentration
EXPOSURE: LaW_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1911 -0.6100 0.0213 0.5978 6.7629

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.763 1.328
Residual 1.404 1.185
Number of obs: 4980, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.244646 0.341978 12.412
log_within 0.030621 0.007476 4.096
log_between 0.139162 0.066310 2.099
sexM 0.281465 0.234952 1.198
age 0.036382 0.007374 4.934
ms -0.176719 0.019193 -9.207

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.030
log_between -0.429 0.000
sexM -0.151 0.003 -0.001
age -0.832 -0.006 0.145 -0.052
ms -0.327 -0.093 -0.001 -0.034 0.076

Robustness weights for the residuals:
3908 weights are ~= 1. The remaining 1072 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.581 0.754 0.730 0.909 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.360 0.564 0.740 0.724 0.889 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4973)	p
(Intercept)	4.24	0.34	[3.57, 4.92]	12.41	< .001
log within	0.03	7.48e-03	[0.02, 0.05]	4.10	< .001
log between	0.14	0.07	[0.01, 0.27]	2.10	0.036
sex [M]	0.28	0.23	[-0.18, 0.74]	1.20	0.231
age	0.04	7.37e-03	[0.02, 0.05]	4.93	< .001
ms	-0.18	0.02	[-0.21, -0.14]	-9.21	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1629 -0.6035 0.0289 0.5986 6.8299

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.766 1.329
Residual 1.400 1.183
Number of obs: 4954, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.889032 0.421789 9.220
log_within 0.034648 0.009471 3.658
log_between 0.189547 0.084627 2.240
sexM 0.252631 0.235197 1.074
age 0.035680 0.007323 4.873
ms -0.174294 0.019414 -8.978

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.680 -0.001
sexM -0.111 0.002 -0.017
age -0.679 -0.004 0.072 -0.053
ms -0.277 -0.064 0.015 -0.036 0.076

Robustness weights for the residuals:
3893 weights are ~= 1. The remaining 1061 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.582 0.754 0.727 0.902 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.358 0.583 0.698 0.725 0.896 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4947)	p
(Intercept)	3.89	0.42	[3.06, 4.72]	9.22	< .001
log within	0.03	9.47e-03	[0.02, 0.05]	3.66	< .001
log between	0.19	0.08	[0.02, 0.36]	2.24	0.025
sex [M]	0.25	0.24	[-0.21, 0.71]	1.07	0.283
age	0.04	7.32e-03	[0.02, 0.05]	4.87	< .001
ms	-0.17	0.02	[-0.21, -0.14]	-8.98	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1720 -0.6002 0.0276 0.6013 6.8255

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.772 1.331
Residual 1.401 1.184
Number of obs: 4961, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.003019 0.391342 10.229
log_within 0.035329 0.008672 4.074
log_between 0.162995 0.076300 2.136
sexM 0.243251 0.235620 1.032
age 0.036044 0.007350 4.904
ms -0.169331 0.019269 -8.788

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.016
log_between -0.612 -0.001
sexM -0.118 0.002 -0.024
age -0.739 -0.004 0.100 -0.054
ms -0.294 -0.058 0.013 -0.035 0.076

Robustness weights for the residuals:
3903 weights are ~= 1. The remaining 1058 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.581 0.751 0.727 0.909 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.359 0.565 0.708 0.718 0.876 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4954)	p
(Intercept)	4.00	0.39	[3.24, 4.77]	10.23	< .001
log within	0.04	8.67e-03	[0.02, 0.05]	4.07	< .001
log between	0.16	0.08	[0.01, 0.31]	2.14	0.033
sex [M]	0.24	0.24	[-0.22, 0.71]	1.03	0.302
age	0.04	7.35e-03	[0.02, 0.05]	4.90	< .001
ms	-0.17	0.02	[-0.21, -0.13]	-8.79	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_3.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1461 -0.5982 0.0253 0.5930 6.8646

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.799 1.341
Residual 1.398 1.182
Number of obs: 4934, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.889400 0.465022 8.364
log_within 0.032278 0.011135 2.899
log_between 0.166641 0.094540 1.763
sexM 0.228039 0.237399 0.961
age 0.035358 0.007371 4.797
ms -0.168813 0.019832 -8.512

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.014
log_between -0.741 -0.002
sexM -0.087 0.002 -0.035
age -0.598 -0.003 0.027 -0.053
ms -0.267 -0.053 0.028 -0.036 0.076

Robustness weights for the residuals:
3882 weights are ~= 1. The remaining 1052 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.580 0.749 0.725 0.903 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.364 0.592 0.706 0.724 0.883 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4927)	p
(Intercept)	3.89	0.47	[2.98, 4.80]	8.36	< .001
log within	0.03	0.01	[0.01, 0.05]	2.90	0.004
log between	0.17	0.09	[-0.02, 0.35]	1.76	0.078
sex [M]	0.23	0.24	[-0.24, 0.69]	0.96	0.337
age	0.04	7.37e-03	[0.02, 0.05]	4.80	< .001
ms	-0.17	0.02	[-0.21, -0.13]	-8.51	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	1.18


```
=====
OUTCOME: concentration
EXPOSURE: LaW_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1501 -0.5992 0.0259 0.5935 6.8037

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.775 1.332
Residual 1.401 1.184
Number of obs: 4946, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.840671 0.442799 8.674
log_within 0.036142 0.010286 3.514
log_between 0.192034 0.089173 2.153
sexM 0.235937 0.235869 1.000
age 0.035675 0.007332 4.866
ms -0.174194 0.019513 -8.927

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.016
log_between -0.713 -0.001
sexM -0.096 0.002 -0.030
age -0.640 -0.004 0.053 -0.053
ms -0.270 -0.061 0.020 -0.036 0.076

Robustness weights for the residuals:
3886 weights are ~= 1. The remaining 1060 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.583 0.752 0.727 0.902 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.361 0.588 0.702 0.725 0.898 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4939)	p
(Intercept)	3.84	0.44	[2.97, 4.71]	8.67	< .001
log within	0.04	0.01	[0.02, 0.06]	3.51	< .001
log between	0.19	0.09	[0.02, 0.37]	2.15	0.031
sex [M]	0.24	0.24	[-0.23, 0.70]	1.00	0.317
age	0.04	7.33e-03	[0.02, 0.05]	4.87	< .001
ms	-0.17	0.02	[-0.21, -0.14]	-8.93	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_4.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1535 -0.6011 0.0248 0.5932 6.8952

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.852 1.361
Residual 1.392 1.180
Number of obs: 4877, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.033189 0.504368 7.997
log_within 0.037770 0.012538 3.012
log_between 0.131122 0.104392 1.256
sexM 0.242549 0.240793 1.007
age 0.034476 0.007475 4.612
ms -0.174880 0.020617 -8.483

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.010
log_between -0.777 -0.001
sexM -0.088 0.002 -0.021
age -0.519 -0.003 -0.028 -0.051
ms -0.261 -0.040 0.037 -0.039 0.072

Robustness weights for the residuals:
3825 weights are ~= 1. The remaining 1052 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.585 0.753 0.727 0.905 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.376 0.562 0.704 0.725 0.892 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4870)	p
(Intercept)	4.03	0.50	[3.04, 5.02]	8.00	< .001
log within	0.04	0.01	[0.01, 0.06]	3.01	0.003
log between	0.13	0.10	[-0.07, 0.34]	1.26	0.209
sex [M]	0.24	0.24	[-0.23, 0.71]	1.01	0.314
age	0.03	7.47e-03	[0.02, 0.05]	4.61	< .001
ms	-0.17	0.02	[-0.22, -0.13]	-8.48	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_4
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
  Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1583 -0.5994  0.0275  0.5914  6.8840
```

```
Random effects:
 Groups   Name      Variance Std.Dev.
 id      (Intercept) 1.858    1.363
 Residual                1.393    1.180
Number of obs: 4906, groups: id, 171
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)  3.970598   0.491302   8.082
log_within   0.035595   0.011916   2.987
log_between  0.145900   0.100808   1.447
sexM         0.240648   0.241097   0.998
age          0.034633   0.007482   4.629
ms          -0.172632   0.020228  -8.534
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within  0.012
log_between -0.764 -0.002
sexM        -0.089  0.002 -0.024
age         -0.557 -0.003  0.003 -0.051
ms          -0.258 -0.049  0.031 -0.039  0.073
```

```
Robustness weights for the residuals:
3858 weights are ~= 1. The remaining 1048 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.583   0.750   0.726  0.901   0.999
```

```
Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.376  0.568   0.688   0.720  0.875   0.997
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4899)	p
(Intercept)	3.97	0.49	[3.01, 4.93]	8.08	< .001
log within	0.04	0.01	[0.01, 0.06]	2.99	0.003
log between	0.15	0.10	[-0.05, 0.34]	1.45	0.148
sex [M]	0.24	0.24	[-0.23, 0.71]	1.00	0.318
age	0.03	7.48e-03	[0.02, 0.05]	4.63	< .001
ms	-0.17	0.02	[-0.21, -0.13]	-8.53	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_5.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1098 -0.5979 0.0266 0.5976 6.8743

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.842 1.357
Residual 1.408 1.186
Number of obs: 4761, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.055421 0.536417 7.560
log_within 0.045982 0.014151 3.249
log_between 0.109762 0.111031 0.989
sexM 0.230967 0.240655 0.960
age 0.034695 0.007471 4.644
ms -0.166713 0.022065 -7.556

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between -0.803 0.000
sexM -0.100 0.000 0.002
age -0.477 0.000 -0.039 -0.050
ms -0.265 -0.006 0.046 -0.039 0.071

Robustness weights for the residuals:
3743 weights are ~= 1. The remaining 1018 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.166 0.585 0.754 0.727 0.905 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.369 0.561 0.699 0.713 0.878 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4754)	p
(Intercept)	4.06	0.54	[3.00, 5.11]	7.56	< .001
log within	0.05	0.01	[0.02, 0.07]	3.25	0.001
log between	0.11	0.11	[-0.11, 0.33]	0.99	0.323
sex [M]	0.23	0.24	[-0.24, 0.70]	0.96	0.337
age	0.03	7.47e-03	[0.02, 0.05]	4.64	< .001
ms	-0.17	0.02	[-0.21, -0.12]	-7.56	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.19

```
=====
OUTCOME: concentration
EXPOSURE: LaW_5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1417 -0.6004 0.0261 0.5964 6.9022

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.851 1.360
Residual 1.397 1.182
Number of obs: 4823, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.05955 0.51682 7.855
log_within 0.04693 0.01341 3.501
log_between 0.12438 0.10709 1.162
sexM 0.23744 0.24079 0.986
age 0.03421 0.00748 4.573
ms -0.17393 0.02124 -8.187

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.006
log_between -0.788 -0.001
sexM -0.088 0.001 -0.018
age -0.494 -0.001 -0.043 -0.051
ms -0.263 -0.022 0.040 -0.039 0.072

Robustness weights for the residuals:
3791 weights are ~= 1. The remaining 1032 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.583 0.753 0.726 0.900 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.373 0.562 0.688 0.716 0.869 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4816)	p
(Intercept)	4.06	0.52	[3.05, 5.07]	7.85	< .001
log within	0.05	0.01	[0.02, 0.07]	3.50	< .001
log between	0.12	0.11	[-0.09, 0.33]	1.16	0.245
sex [M]	0.24	0.24	[-0.23, 0.71]	0.99	0.324
age	0.03	7.48e-03	[0.02, 0.05]	4.57	< .001
ms	-0.17	0.02	[-0.22, -0.13]	-8.19	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.18

```
=====
OUTCOME: concentration
EXPOSURE: LaW_6.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1185 -0.6034 0.0232 0.5955 6.8422

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.861 1.364
Residual 1.408 1.186
Number of obs: 4580, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.25912 0.52864 8.057
log_within 0.05329 0.01586 3.360
log_between 0.05451 0.10634 0.513
sexM 0.23880 0.24261 0.984
age 0.03501 0.00752 4.655
ms -0.16770 0.02404 -6.976

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.008
log_between -0.791 0.001
sexM -0.128 -0.001 0.038
age -0.479 0.002 -0.050 -0.053
ms -0.279 0.027 0.044 -0.039 0.066

Robustness weights for the residuals:
3603 weights are ~= 1. The remaining 977 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.166 0.588 0.750 0.728 0.900 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.373 0.559 0.703 0.692 0.826 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4573)	p
(Intercept)	4.26	0.53	[3.22, 5.30]	8.06	< .001
log within	0.05	0.02	[0.02, 0.08]	3.36	< .001
log between	0.05	0.11	[-0.15, 0.26]	0.51	0.608
sex [M]	0.24	0.24	[-0.24, 0.71]	0.98	0.325
age	0.04	7.52e-03	[0.02, 0.05]	4.66	< .001
ms	-0.17	0.02	[-0.21, -0.12]	-6.98	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.19

```
=====
OUTCOME: concentration
EXPOSURE: LaW_6
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.0941 -0.5991  0.0230  0.5986  6.8587
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.851    1.360
Residual                1.414    1.189
Number of obs: 4678, groups: id, 171
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.186241   0.523546   7.996
log_within   0.048588   0.014946   3.251
log_between  0.073873   0.105630   0.699
sexM         0.237383   0.241630   0.982
age          0.034856   0.007495   4.651
ms          -0.165773   0.023058  -7.189
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.001
log_between -0.789  0.000
sexM        -0.115  0.000  0.019
age         -0.490  0.000 -0.042 -0.052
ms          -0.278  0.002  0.047 -0.039  0.069
```

```
Robustness weights for the residuals:
3677 weights are ~= 1. The remaining 1001 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.166  0.579   0.753   0.727  0.902   0.999
```

```
Robustness weights for the random effects:
139 weights are ~= 1. The remaining 32 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.371  0.561   0.701   0.705  0.850   0.999
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4671)	p
(Intercept)	4.19	0.52	[3.16, 5.21]	8.00	< .001
log within	0.05	0.01	[0.02, 0.08]	3.25	0.001
log between	0.07	0.11	[-0.13, 0.28]	0.70	0.484
sex [M]	0.24	0.24	[-0.24, 0.71]	0.98	0.326
age	0.03	7.49e-03	[0.02, 0.05]	4.65	< .001
ms	-0.17	0.02	[-0.21, -0.12]	-7.19	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.19

```
=====
OUTCOME: concentration
EXPOSURE: LaW_7.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.3040 -0.5946 0.0293 0.5968 6.9078

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.93 1.389
Residual 1.35 1.162
Number of obs: 4197, groups: id, 170

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.225576 0.554019 7.627
log_within 0.070581 0.017241 4.094
log_between 0.048105 0.110999 0.433
sexM 0.245546 0.248634 0.988
age 0.036473 0.007672 4.754
ms -0.171438 0.026908 -6.371

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.009
log_between -0.798 0.001
sexM -0.121 -0.001 0.032
age -0.472 0.002 -0.043 -0.054
ms -0.281 0.030 0.042 -0.040 0.059

Robustness weights for the residuals:
3302 weights are ~= 1. The remaining 895 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.162 0.585 0.744 0.725 0.898 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.378 0.565 0.693 0.707 0.851 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4190)	p
(Intercept)	4.23	0.55	[3.14, 5.31]	7.63	< .001
log within	0.07	0.02	[0.04, 0.10]	4.09	< .001
log between	0.05	0.11	[-0.17, 0.27]	0.43	0.665
sex [M]	0.25	0.25	[-0.24, 0.73]	0.99	0.323
age	0.04	7.67e-03	[0.02, 0.05]	4.75	< .001
ms	-0.17	0.03	[-0.22, -0.12]	-6.37	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.39
SD (Residual)	1.16


```
=====
OUTCOME: concentration
EXPOSURE: LaW_7
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2121 -0.6015 0.0238 0.5981 6.8768

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.876 1.370
Residual 1.378 1.174
Number of obs: 4426, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.249438 0.537525 7.906
log_within 0.056712 0.016565 3.424
log_between 0.052892 0.107538 0.492
sexM 0.229152 0.244576 0.937
age 0.035914 0.007559 4.751
ms -0.173769 0.025137 -6.913

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.007
log_between -0.794 0.001
sexM -0.127 -0.001 0.038
age -0.477 0.002 -0.046 -0.055
ms -0.276 0.024 0.041 -0.039 0.061

Robustness weights for the residuals:
3486 weights are ~= 1. The remaining 940 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.587 0.748 0.727 0.895 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.374 0.560 0.668 0.686 0.825 0.987

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4419)	p
(Intercept)	4.25	0.54	[3.20, 5.30]	7.91	< .001
log within	0.06	0.02	[0.02, 0.09]	3.42	< .001
log between	0.05	0.11	[-0.16, 0.26]	0.49	0.623
sex [M]	0.23	0.24	[-0.25, 0.71]	0.94	0.349
age	0.04	7.56e-03	[0.02, 0.05]	4.75	< .001
ms	-0.17	0.03	[-0.22, -0.12]	-6.91	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	1.17

```
=====
OUTCOME: concentration
EXPOSURE: LaW_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.3517 -0.5960 0.0369 0.5984 6.9149

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.007 1.417
Residual 1.328 1.153
Number of obs: 3836, groups: id, 166

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.02482 0.55881 7.202
log_within 0.07478 0.01843 4.057
log_between 0.07031 0.11140 0.631
sexM 0.19917 0.25732 0.774
age 0.03636 0.00786 4.626
ms -0.13857 0.02979 -4.652

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.013
log_between -0.787 0.002
sexM -0.129 -0.002 0.047
age -0.477 0.003 -0.048 -0.065
ms -0.293 0.044 0.039 -0.034 0.055

Robustness weights for the residuals:
3018 weights are ~= 1. The remaining 818 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.161 0.578 0.751 0.725 0.896 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.383 0.560 0.709 0.719 0.885 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3829)	p
(Intercept)	4.02	0.56	[2.93, 5.12]	7.20	< .001
log within	0.07	0.02	[0.04, 0.11]	4.06	< .001
log between	0.07	0.11	[-0.15, 0.29]	0.63	0.528
sex [M]	0.20	0.26	[-0.31, 0.70]	0.77	0.439
age	0.04	7.86e-03	[0.02, 0.05]	4.63	< .001
ms	-0.14	0.03	[-0.20, -0.08]	-4.65	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.42
SD (Residual)	1.15

```

=====
OUTCOME: concentration
EXPOSURE: LaW_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.4319 -0.5959  0.0372  0.6045  6.7041

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      2.023     1.422
Residual                   1.289     1.135
Number of obs: 4069, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)  3.019239   0.557626   5.414
log_within   0.113364   0.018787   6.034
log_between  0.213806   0.113282   1.887
sexM         0.198253   0.255601   0.776
age          0.037218   0.007763   4.794
ms          -0.044088   0.027215  -1.620

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within  0.005
log_between -0.796  0.000
sexM        -0.108  0.001  0.009
age         -0.503 -0.001 -0.015 -0.050
ms          -0.251 -0.022  0.029 -0.039  0.058

Robustness weights for the residuals:
3210 weights are ~= 1. The remaining 859 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.160  0.577   0.744   0.720  0.896   0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.381  0.568   0.695   0.732  0.939   0.994

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4062) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.02 | 0.56 | [ 1.93, 4.11] | 5.41 | < .001
log within | 0.11 | 0.02 | [ 0.08, 0.15] | 6.03 | < .001
log between | 0.21 | 0.11 | [-0.01, 0.44] | 1.89 | 0.059
sex [M] | 0.20 | 0.26 | [-0.30, 0.70] | 0.78 | 0.438
age | 0.04 | 7.76e-03 | [ 0.02, 0.05] | 4.79 | < .001
ms | -0.04 | 0.03 | [-0.10, 0.01] | -1.62 | 0.105

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.42
SD (Residual) | 1.14

```

```
=====
OUTCOME: energy
EXPOSURE: DAY_10_11
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5225 -0.6115 0.0336 0.5937 7.3112

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.459 1.208
Residual 1.232 1.110
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.339624 0.309778 10.781
log_within 0.045399 0.007502 6.052
log_between 0.125728 0.048978 2.567
sexM 0.486170 0.212955 2.283
age 0.025854 0.006792 3.807
wakeupTime_dec 0.030355 0.014071 2.157

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.189
log_between -0.324 0.057
sexM -0.180 -0.004 0.070
age -0.656 0.011 -0.287 -0.062
wakeupTm_dc -0.483 0.391 0.146 -0.011 0.029

Robustness weights for the residuals:
4466 weights are ~= 1. The remaining 1194 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.179 0.554 0.735 0.713 0.896 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.393 0.604 0.759 0.741 0.889 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	3.34	0.31	[2.73, 3.95]	10.78	< .001
log within	0.05	7.50e-03	[0.03, 0.06]	6.05	< .001
log between	0.13	0.05	[0.03, 0.22]	2.57	0.010
sex [M]	0.49	0.21	[0.07, 0.90]	2.28	0.022
age	0.03	6.79e-03	[0.01, 0.04]	3.81	< .001
wakeupTime dec	0.03	0.01	[0.00, 0.06]	2.16	0.031

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_11_12
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5729 -0.6074 0.0387 0.5983 7.4221

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.466 1.211
Residual 1.229 1.109
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.234135 0.342312 9.448
log_within 0.057562 0.008308 6.928
log_between 0.141510 0.057958 2.442
sexM 0.450486 0.213069 2.114
age 0.026358 0.006712 3.927
wakeupTime_dec 0.023099 0.013552 1.704

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.138
log_between -0.525 0.039
sexM -0.162 -0.005 0.034
age -0.563 0.012 -0.237 -0.051
wakeupTm_dc -0.449 0.308 0.128 -0.016 0.039

Robustness weights for the residuals:
4459 weights are ~= 1. The remaining 1201 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.178 0.553 0.735 0.715 0.902 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 37 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.386 0.628 0.803 0.755 0.895 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	3.23	0.34	[2.56, 3.91]	9.45	< .001
log within	0.06	8.31e-03	[0.04, 0.07]	6.93	< .001
log between	0.14	0.06	[0.03, 0.26]	2.44	0.015
sex [M]	0.45	0.21	[0.03, 0.87]	2.11	0.035
age	0.03	6.71e-03	[0.01, 0.04]	3.93	< .001
wakeupTime dec	0.02	0.01	[0.00, 0.05]	1.70	0.088

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_12_13
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.6600 -0.6083 0.0429 0.5957 7.5371

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.487 1.219
Residual 1.228 1.108
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.199814 0.395454 8.091
log_within 0.055924 0.009256 6.042
log_between 0.150851 0.071688 2.104
sexM 0.440199 0.214647 2.051
age 0.028011 0.006678 4.195
wakeupTime_dec 0.011346 0.013194 0.860

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.084
log_between -0.676 0.024
sexM -0.156 -0.003 0.045
age -0.480 0.010 -0.184 -0.052
wakeupTm_dc -0.399 0.211 0.112 -0.014 0.047

Robustness weights for the residuals:
4437 weights are ~= 1. The remaining 1224 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.176 0.557 0.746 0.720 0.904 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.396 0.625 0.775 0.753 0.918 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.20	0.40	[2.42, 3.98]	8.09	< .001
log within	0.06	9.26e-03	[0.04, 0.07]	6.04	< .001
log between	0.15	0.07	[0.01, 0.29]	2.10	0.035
sex [M]	0.44	0.21	[0.02, 0.86]	2.05	0.040
age	0.03	6.68e-03	[0.01, 0.04]	4.19	< .001
wakeupTime dec	0.01	0.01	[-0.01, 0.04]	0.86	0.390

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_13_14
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.4553 -0.6128 0.0467 0.5875 7.2768

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.489 1.220
Residual 1.226 1.107
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.101147 0.455726 6.805
log_within 0.053069 0.009144 5.803
log_between 0.184611 0.087635 2.107
sexM 0.461937 0.214879 2.150
age 0.027814 0.006641 4.188
wakeupTime_dec 0.003443 0.012991 0.265

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.049
log_between -0.770 0.012
sexM -0.152 -0.002 0.057
age -0.413 0.008 -0.149 -0.052
wakeupTm_dc -0.341 0.145 0.083 -0.015 0.055

Robustness weights for the residuals:
4436 weights are ~= 1. The remaining 1223 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.180 0.553 0.745 0.720 0.904 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.393 0.614 0.770 0.754 0.933 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	3.10	0.46	[2.21, 3.99]	6.80	< .001
log within	0.05	9.14e-03	[0.04, 0.07]	5.80	< .001
log between	0.18	0.09	[0.01, 0.36]	2.11	0.035
sex [M]	0.46	0.21	[0.04, 0.88]	2.15	0.032
age	0.03	6.64e-03	[0.01, 0.04]	4.19	< .001
wakeupTime dec	3.44e-03	0.01	[-0.02, 0.03]	0.27	0.791

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_14_15
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5281 -0.6134 0.0437 0.5937 7.2797

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.446 1.203
Residual 1.221 1.105
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.215732 0.467358 6.881
log_within 0.059751 0.008356 7.151
log_between 0.164639 0.089261 1.844
sexM 0.446629 0.212234 2.104
age 0.028996 0.006490 4.468
wakeupTime_dec -0.001848 0.012867 -0.144

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.027
log_between -0.789 0.004
sexM -0.168 -0.001 0.080
age -0.459 0.006 -0.066 -0.049
wakeupTm_dc -0.307 0.088 0.047 -0.015 0.065

Robustness weights for the residuals:
4447 weights are ~= 1. The remaining 1212 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.179 0.548 0.741 0.716 0.896 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.385 0.595 0.777 0.741 0.905 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	3.22	0.47	[2.30, 4.13]	6.88	< .001
log within	0.06	8.36e-03	[0.04, 0.08]	7.15	< .001
log between	0.16	0.09	[-0.01, 0.34]	1.84	0.065
sex [M]	0.45	0.21	[0.03, 0.86]	2.10	0.035
age	0.03	6.49e-03	[0.02, 0.04]	4.47	< .001
wakeupTime dec	-1.85e-03	0.01	[-0.03, 0.02]	-0.14	0.886

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	1.10


```
=====
OUTCOME: energy
EXPOSURE: DAY_15_16
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5222 -0.6116 0.0403 0.5941 7.1869

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.462 1.209
Residual 1.228 1.108
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.213757 0.457662 7.022
log_within 0.066608 0.008265 8.059
log_between 0.157437 0.084738 1.858
sexM 0.422542 0.212771 1.986
age 0.029743 0.006511 4.568
wakeupTime_dec 0.001340 0.012886 0.104

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.022
log_between -0.776 0.004
sexM -0.135 -0.001 0.035
age -0.539 0.005 0.016 -0.044
wakeupTm_dc -0.316 0.069 0.052 -0.017 0.069

Robustness weights for the residuals:
4464 weights are ~= 1. The remaining 1195 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.179 0.553 0.744 0.715 0.890 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.386 0.588 0.784 0.741 0.892 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	3.21	0.46	[2.32, 4.11]	7.02	< .001
log within	0.07	8.26e-03	[0.05, 0.08]	8.06	< .001
log between	0.16	0.08	[-0.01, 0.32]	1.86	0.063
sex [M]	0.42	0.21	[0.01, 0.84]	1.99	0.047
age	0.03	6.51e-03	[0.02, 0.04]	4.57	< .001
wakeupTime dec	1.34e-03	0.01	[-0.02, 0.03]	0.10	0.917

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_16_17
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5077 -0.6149 0.0399 0.5894 7.1562

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.433 1.197
Residual 1.233 1.110
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.1681619 0.4312559 7.346
log_within 0.0740717 0.0084262 8.791
log_between 0.1918478 0.0883551 2.171
sexM 0.3737328 0.2110025 1.771
age 0.0296735 0.0064480 4.602
wakeupTime_dec 0.0009527 0.0128702 0.074

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.023
log_between -0.748 0.003
sexM -0.067 -0.002 -0.061
age -0.555 0.005 0.001 -0.044
wakeupTm_dc -0.325 0.070 0.044 -0.022 0.070

Robustness weights for the residuals:
4464 weights are ~= 1. The remaining 1197 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.179 0.559 0.741 0.717 0.897 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.385 0.585 0.743 0.715 0.843 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.17	0.43	[2.32, 4.01]	7.35	< .001
log within	0.07	8.43e-03	[0.06, 0.09]	8.79	< .001
log between	0.19	0.09	[0.02, 0.37]	2.17	0.030
sex [M]	0.37	0.21	[-0.04, 0.79]	1.77	0.077
age	0.03	6.45e-03	[0.02, 0.04]	4.60	< .001
wakeupTime dec	9.53e-04	0.01	[-0.02, 0.03]	0.07	0.941

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_17_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5352 -0.6226 0.0372 0.6021 7.2276

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.456 1.206
Residual 1.219 1.104
Number of obs: 5655, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.3709373 0.4160740 8.102
log_within 0.0726446 0.0089443 8.122
log_between 0.1725705 0.1035676 1.666
sexM 0.3509941 0.2138005 1.642
age 0.0303091 0.0065013 4.662
wakeupTime_dec -0.0006405 0.0128181 -0.050

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.018
log_between -0.722 0.001
sexM -0.029 -0.001 -0.123
age -0.608 0.004 0.043 -0.049
wakeupTm_dc -0.322 0.056 0.028 -0.022 0.070

Robustness weights for the residuals:
4457 weights are ~= 1. The remaining 1198 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.178 0.554 0.734 0.715 0.896 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 38 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.389 0.618 0.792 0.758 0.931 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5648)	p
(Intercept)	3.37	0.42	[2.56, 4.19]	8.10	< .001
log within	0.07	8.94e-03	[0.06, 0.09]	8.12	< .001
log between	0.17	0.10	[-0.03, 0.38]	1.67	0.096
sex [M]	0.35	0.21	[-0.07, 0.77]	1.64	0.101
age	0.03	6.50e-03	[0.02, 0.04]	4.66	< .001
wakeupTime dec	-6.41e-04	0.01	[-0.03, 0.02]	-0.05	0.960

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.10

```
=====
OUTCOME: energy
EXPOSURE: DAY_8_9
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.4032 -0.6193 0.0509 0.6049 7.2365

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.413 1.189
Residual 1.240 1.113
Number of obs: 5662, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.779913 0.290202 13.025
log_within 0.019709 0.007022 2.807
log_between 0.153257 0.045241 3.388
sexM 0.541124 0.210530 2.570
age 0.026165 0.006530 4.007
wakeupTime_dec 0.014055 0.014198 0.990

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.188
log_between 0.010 0.060
sexM -0.163 -0.002 0.111
age -0.811 0.018 -0.191 -0.064
wakeupTm_dc -0.468 0.402 0.149 -0.005 0.046

Robustness weights for the residuals:
4464 weights are ~= 1. The remaining 1198 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.182 0.555 0.738 0.714 0.893 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.384 0.620 0.757 0.740 0.925 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5655)	p
(Intercept)	3.78	0.29	[3.21, 4.35]	13.03	< .001
log within	0.02	7.02e-03	[0.01, 0.03]	2.81	0.005
log between	0.15	0.05	[0.06, 0.24]	3.39	< .001
sex [M]	0.54	0.21	[0.13, 0.95]	2.57	0.010
age	0.03	6.53e-03	[0.01, 0.04]	4.01	< .001
wakeupTime dec	0.01	0.01	[-0.01, 0.04]	0.99	0.322

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_9_10
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.4824 -0.6115 0.0387 0.5975 7.2463

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.433 1.197
Residual 1.232 1.110
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.584234 0.296825 12.075
log_within 0.024982 0.007139 3.499
log_between 0.131159 0.044262 2.963
sexM 0.504555 0.211249 2.388
age 0.025805 0.006651 3.880
wakeupTime_dec 0.018082 0.014480 1.249

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.218
log_between -0.161 0.069
sexM -0.174 -0.004 0.075
age -0.748 0.016 -0.243 -0.061
wakeupTm_dc -0.493 0.443 0.156 -0.009 0.036

Robustness weights for the residuals:
4453 weights are ~= 1. The remaining 1208 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.180 0.557 0.743 0.717 0.898 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.393 0.603 0.804 0.752 0.920 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.58	0.30	[3.00, 4.17]	12.08	< .001
log within	0.02	7.14e-03	[0.01, 0.04]	3.50	< .001
log between	0.13	0.04	[0.04, 0.22]	2.96	0.003
sex [M]	0.50	0.21	[0.09, 0.92]	2.39	0.017
age	0.03	6.65e-03	[0.01, 0.04]	3.88	< .001
wakeupTime dec	0.02	0.01	[-0.01, 0.05]	1.25	0.212

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: DAY_sunrise_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.4355 -0.6228 0.0487 0.6006 7.2198

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.422 1.192
Residual 1.239 1.113
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.1592805 0.3043410 13.667
log_within 0.0134756 0.0092667 1.454
log_between 0.1690244 0.0617068 2.739
sexM 0.5114241 0.2112798 2.421
age 0.0282428 0.0064470 4.381
wakeupTime_dec 0.0005187 0.0134540 0.039

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.105
log_between 0.326 0.029
sexM -0.120 -0.002 0.116
age -0.808 0.017 -0.081 -0.053
wakeupTm_dc -0.393 0.268 0.108 -0.009 0.063

Robustness weights for the residuals:
4470 weights are ~= 1. The remaining 1191 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.181 0.555 0.731 0.712 0.889 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.368 0.600 0.757 0.746 0.938 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.16	0.30	[3.56, 4.76]	13.67	< .001
log within	0.01	9.27e-03	[0.00, 0.03]	1.45	0.146
log between	0.17	0.06	[0.05, 0.29]	2.74	0.006
sex [M]	0.51	0.21	[0.10, 0.93]	2.42	0.016
age	0.03	6.45e-03	[0.02, 0.04]	4.38	< .001
wakeupTime dec	5.19e-04	0.01	[-0.03, 0.03]	0.04	0.969

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LAN_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.4697 -0.5818 0.0449 0.5776 4.9244

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7296 1.3152
Residual 0.9806 0.9903
Number of obs: 2255, groups: id, 139

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.971746 0.385791 10.295
log_within -0.004622 0.009749 -0.474
log_between -0.004353 0.073207 -0.059
sexM 0.384176 0.273357 1.405
age 0.028150 0.008192 3.436
ms 0.044202 0.037727 1.172

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.025
log_between 0.372 -0.001
sexM -0.171 -0.003 -0.127
age -0.836 0.004 -0.202 -0.044
ms_dia_sgnt -0.397 0.060 -0.039 -0.025 0.047

Robustness weights for the residuals:
1763 weights are ~= 1. The remaining 492 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.159 0.567 0.762 0.723 0.928 0.999

Robustness weights for the random effects:
110 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.420 0.575 0.829 0.760 0.914 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(2248)	p
(Intercept)	3.97	0.39	[3.22, 4.73]	10.30	< .001
log within	-4.62e-03	9.75e-03	[-0.02, 0.01]	-0.47	0.636
log between	-4.35e-03	0.07	[-0.15, 0.14]	-0.06	0.953
sex [M]	0.38	0.27	[-0.15, 0.92]	1.41	0.160
age	0.03	8.19e-03	[0.01, 0.04]	3.44	< .001
ms	0.04	0.04	[-0.03, 0.12]	1.17	0.241

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	0.99

```
=====
OUTCOME: energy
EXPOSURE: LAN_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2613 -0.6157 0.0532 0.5646 5.0478

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.744 1.321
Residual 1.055 1.027
Number of obs: 3382, groups: id, 151

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.7844903 0.3333343 11.353
log_within 0.0079706 0.0091092 0.875
log_between -0.0331758 0.0824378 -0.402
sexM 0.4282488 0.2547575 1.681
age 0.0345318 0.0076947 4.488
ms 0.0004655 0.0279598 0.017

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.017
log_between 0.078 -0.003
sexM -0.155 0.000 -0.131
age -0.852 0.003 -0.083 -0.058
ms_dia_sgnt -0.389 0.046 -0.025 -0.021 0.063

Robustness weights for the residuals:
2653 weights are ~= 1. The remaining 729 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.163 0.566 0.760 0.723 0.899 0.999

Robustness weights for the random effects:
121 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.425 0.600 0.738 0.740 0.933 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3375)	p
(Intercept)	3.78	0.33	[3.13, 4.44]	11.35	< .001
log within	7.97e-03	9.11e-03	[-0.01, 0.03]	0.87	0.382
log between	-0.03	0.08	[-0.19, 0.13]	-0.40	0.687
sex [M]	0.43	0.25	[-0.07, 0.93]	1.68	0.093
age	0.03	7.69e-03	[0.02, 0.05]	4.49	< .001
ms	4.66e-04	0.03	[-0.05, 0.06]	0.02	0.987

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.03


```

=====
OUTCOME: energy
EXPOSURE: LAN_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.3778 -0.5964  0.0587  0.5548  5.2213

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.887     1.374
Residual                   1.024     1.012
Number of obs: 2829, groups: id, 145

Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.864980   0.365302  10.580
log_within    0.008175   0.009211   0.887
log_between   -0.018126   0.081425  -0.223
sexM           0.413523   0.271168   1.525
age            0.031224   0.008193   3.811
ms             0.027491   0.032620   0.843

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.017
log_between   0.239 -0.002
sexM          -0.163  0.000 -0.097
age           -0.848  0.002 -0.152 -0.055
ms_dia_sgnt  -0.383  0.044 -0.029 -0.022  0.049

Robustness weights for the residuals:
2214 weights are ~= 1. The remaining 615 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.161  0.562   0.754   0.722  0.914   0.999

Robustness weights for the random effects:
116 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.445  0.625   0.776   0.750  0.876   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2822) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.86 | 0.37 | [ 3.15, 4.58] | 10.58 | < .001
log within | 8.18e-03 | 9.21e-03 | [-0.01, 0.03] | 0.89 | 0.375
log between | -0.02 | 0.08 | [-0.18, 0.14] | -0.22 | 0.824
sex [M] | 0.41 | 0.27 | [-0.12, 0.95] | 1.52 | 0.127
age | 0.03 | 8.19e-03 | [ 0.02, 0.05] | 3.81 | < .001
ms | 0.03 | 0.03 | [-0.04, 0.09] | 0.84 | 0.399

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.37
SD (Residual) | 1.01

```

```
=====
OUTCOME: energy
EXPOSURE: LAN_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2240 -0.6069 0.0410 0.5892 4.9911

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.602 1.266
Residual 1.071 1.035
Number of obs: 4093, groups: id, 160

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.967387 0.314378 12.620
log_within 0.019942 0.009480 2.104
log_between 0.016484 0.084832 0.194
sexM 0.477158 0.235144 2.029
age 0.032537 0.007245 4.491
ms -0.039175 0.023526 -1.665

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.017
log_between -0.154 -0.003
sexM -0.140 0.000 -0.106
age -0.847 0.003 -0.001 -0.057
ms_dia_sgnt -0.375 0.047 -0.016 -0.022 0.071

Robustness weights for the residuals:
3211 weights are ~= 1. The remaining 882 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.566 0.744 0.720 0.911 0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.413 0.583 0.774 0.761 0.963 0.992

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4086)	p
(Intercept)	3.97	0.31	[3.35, 4.58]	12.62	< .001
log within	0.02	9.48e-03	[0.00, 0.04]	2.10	0.035
log between	0.02	0.08	[-0.15, 0.18]	0.19	0.846
sex [M]	0.48	0.24	[0.02, 0.94]	2.03	0.043
age	0.03	7.25e-03	[0.02, 0.05]	4.49	< .001
ms	-0.04	0.02	[-0.09, 0.01]	-1.67	0.096

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.27
SD (Residual)	1.03

```

=====
OUTCOME: energy
EXPOSURE: LAN_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.2761 -0.6104  0.0445  0.5970  5.0385

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.657     1.287
Residual                   1.054     1.027
Number of obs: 3762, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.890694   0.320282  12.148
log_within    0.009003   0.009253   0.973
log_between   0.001583   0.080224   0.020
sexM          0.444171   0.245343   1.810
age           0.033473   0.007431   4.505
ms           -0.021926   0.025543  -0.858

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.024
log_between -0.058 -0.004
sexM        -0.137 -0.001 -0.107
age         -0.851  0.004 -0.024 -0.068
ms_dia_sgnt -0.382  0.067 -0.031 -0.015  0.064

Robustness weights for the residuals:
2958 weights are ~= 1. The remaining 804 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.163  0.562   0.745   0.717  0.901   0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.409  0.571   0.744   0.738  0.928   0.992

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3755) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.89 | 0.32 | [ 3.26, 4.52] | 12.15 | < .001
log within | 9.00e-03 | 9.25e-03 | [-0.01, 0.03] | 0.97 | 0.331
log between | 1.58e-03 | 0.08 | [-0.16, 0.16] | 0.02 | 0.984
sex [M] | 0.44 | 0.25 | [-0.04, 0.93] | 1.81 | 0.070
age | 0.03 | 7.43e-03 | [ 0.02, 0.05] | 4.50 | < .001
ms | -0.02 | 0.03 | [-0.07, 0.03] | -0.86 | 0.391

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.29
SD (Residual) | 1.03

```

```
=====
OUTCOME: energy
EXPOSURE: LAN_20_21
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.7787 -0.6157  0.0526  0.6058  7.5859
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.507     1.228
Residual                   1.154     1.074
Number of obs: 5092, groups: id, 168
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.7139438  0.3563754  10.421
log_within    0.0117797  0.0103975   1.133
log_between   0.1178712  0.1067579   1.104
sexM          0.4262238  0.2199239   1.938
age           0.0282875  0.0067216   4.208
wakeupTime_dec -0.0002544  0.0132862  -0.019
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.004
log_between -0.558  0.000
sexM        -0.073 -0.002 -0.110
age         -0.756 -0.002  0.125 -0.067
wakeupTm_dc -0.364  0.017 -0.002 -0.022  0.069
```

```
Robustness weights for the residuals:
4017 weights are ~= 1. The remaining 1075 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.173  0.551   0.739   0.710  0.896   0.999
```

```
Robustness weights for the random effects:
133 weights are ~= 1. The remaining 35 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.388  0.593   0.788   0.752  0.911   0.997
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5085)	p
(Intercept)	3.71	0.36	[3.02, 4.41]	10.42	< .001
log within	0.01	0.01	[-0.01, 0.03]	1.13	0.257
log between	0.12	0.11	[-0.09, 0.33]	1.10	0.270
sex [M]	0.43	0.22	[0.00, 0.86]	1.94	0.053
age	0.03	6.72e-03	[0.02, 0.04]	4.21	< .001
wakeupTime dec	-2.54e-04	0.01	[-0.03, 0.03]	-0.02	0.985

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.23
SD (Residual)	1.07

```
=====
OUTCOME: energy
EXPOSURE: LAN_21_22
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.7786 -0.6140 0.0501 0.6104 7.5838

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.534 1.238
Residual 1.157 1.076
Number of obs: 5106, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.844583 0.331342 11.603
log_within 0.017358 0.009926 1.749
log_between 0.017683 0.093077 0.190
sexM 0.457664 0.223171 2.051
age 0.027931 0.006772 4.124
wakeupTime_dec 0.004617 0.013365 0.345

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.437 -0.004
sexM -0.076 -0.001 -0.157
age -0.797 -0.001 0.119 -0.072
wakeupTm_dc -0.382 0.012 -0.028 -0.018 0.066

Robustness weights for the residuals:
4033 weights are ~= 1. The remaining 1073 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.173 0.547 0.734 0.708 0.887 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.395 0.602 0.792 0.751 0.914 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5099)	p
(Intercept)	3.84	0.33	[3.20, 4.49]	11.60	< .001
log within	0.02	9.93e-03	[0.00, 0.04]	1.75	0.080
log between	0.02	0.09	[-0.16, 0.20]	0.19	0.849
sex [M]	0.46	0.22	[0.02, 0.90]	2.05	0.040
age	0.03	6.77e-03	[0.01, 0.04]	4.12	< .001
wakeupTime dec	4.62e-03	0.01	[-0.02, 0.03]	0.35	0.730

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.24
SD (Residual)	1.08

```
=====
OUTCOME: energy
EXPOSURE: LAN_22_23
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.7622 -0.6101 0.0504 0.6102 7.5979

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.552 1.246
Residual 1.152 1.073
Number of obs: 5101, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.984193 0.304749 13.074
log_within 0.011571 0.008438 1.371
log_between -0.107484 0.072765 -1.477
sexM 0.560160 0.226589 2.472
age 0.027085 0.006814 3.975
wakeupTime_dec 0.001194 0.013351 0.089

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.002
log_between -0.188 -0.001
sexM -0.118 0.002 -0.207
age -0.837 -0.001 0.123 -0.078
wakeupTm_dc -0.414 0.005 -0.068 -0.008 0.061

Robustness weights for the residuals:
4032 weights are ~= 1. The remaining 1069 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.173 0.542 0.738 0.707 0.882 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.397 0.627 0.794 0.766 0.955 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5094)	p
(Intercept)	3.98	0.30	[3.39, 4.58]	13.07	< .001
log within	0.01	8.44e-03	[0.00, 0.03]	1.37	0.170
log between	-0.11	0.07	[-0.25, 0.04]	-1.48	0.140
sex [M]	0.56	0.23	[0.12, 1.00]	2.47	0.013
age	0.03	6.81e-03	[0.01, 0.04]	3.97	< .001
wakeupTime dec	1.19e-03	0.01	[-0.02, 0.03]	0.09	0.929

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.25
SD (Residual)	1.07

```
=====
OUTCOME: energy
EXPOSURE: LAN_23_0
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.7801 -0.6071 0.0434 0.6106 7.5970

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.544 1.243
Residual 1.158 1.076
Number of obs: 5096, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.8962286 0.2999647 12.989
log_within -0.0121900 0.0078393 -1.555
log_between -0.1156756 0.0617295 -1.874
sexM 0.6048865 0.2286534 2.645
age 0.0265737 0.0067881 3.915
wakeupTime_dec -0.0009916 0.0134345 -0.074

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.018
log_between 0.085 0.002
sexM -0.179 0.000 -0.254
age -0.817 -0.004 0.109 -0.080
wakeupTm_dc -0.442 -0.036 -0.103 0.004 0.058

Robustness weights for the residuals:
4025 weights are ~= 1. The remaining 1071 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.173 0.542 0.743 0.709 0.890 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.396 0.620 0.810 0.766 0.932 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5089)	p
(Intercept)	3.90	0.30	[3.31, 4.48]	12.99	< .001
log within	-0.01	7.84e-03	[-0.03, 0.00]	-1.55	0.120
log between	-0.12	0.06	[-0.24, 0.01]	-1.87	0.061
sex [M]	0.60	0.23	[0.16, 1.05]	2.65	0.008
age	0.03	6.79e-03	[0.01, 0.04]	3.91	< .001
wakeupTime dec	-9.92e-04	0.01	[-0.03, 0.03]	-0.07	0.941

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.24
SD (Residual)	1.08

```

=====
OUTCOME: energy
EXPOSURE: LAN_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1476 -0.6140  0.0368  0.5902  4.9449

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.560     1.249
Residual                   1.097     1.047
Number of obs: 4262, groups: id, 164

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.939341   0.309355  12.734
log_within     0.022567   0.010187   2.215
log_between    0.038710   0.085086   0.455
sexM           0.489816   0.229845   2.131
age            0.032084   0.007023   4.569
ms            -0.039251   0.022442  -1.749

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.026
log_between -0.221 -0.004
sexM        -0.120  0.000 -0.097
age         -0.835  0.005  0.006 -0.074
ms_dia_sgnt -0.374  0.071 -0.026 -0.023  0.075

Robustness weights for the residuals:
3353 weights are ~= 1. The remaining 909 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.566  0.743  0.716  0.902  0.999

Robustness weights for the random effects:
130 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.408  0.589  0.769  0.757  0.943  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4255) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.94 | 0.31 | [ 3.33, 4.55] | 12.73 | < .001
log within | 0.02 | 0.01 | [ 0.00, 0.04] | 2.22 | 0.027
log between | 0.04 | 0.09 | [-0.13, 0.21] | 0.45 | 0.649
sex [M] | 0.49 | 0.23 | [ 0.04, 0.94] | 2.13 | 0.033
age | 0.03 | 7.02e-03 | [ 0.02, 0.05] | 4.57 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -1.75 | 0.080

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.25
SD (Residual) | 1.05

```



```

=====
OUTCOME: energy
EXPOSURE: LAN_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.0116 -0.6178  0.0447  0.5988  7.8338

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.517     1.232
Residual                   1.128     1.062
Number of obs: 4809, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.166965   0.342580  12.163
log_within      0.019656   0.014650   1.342
log_between     0.032511   0.106019   0.307
sexM            0.482538   0.221945   2.174
age             0.030045   0.006854   4.384
ms             -0.082376   0.017569  -4.689

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.003
log_between   -0.544 -0.002
sexM          -0.099  0.001 -0.053
age           -0.780 -0.001  0.107 -0.076
ms_dia_sgnt  -0.283  0.000 -0.022 -0.037  0.080

Robustness weights for the residuals:
3787 weights are ~= 1. The remaining 1022 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.168  0.558   0.738   0.713  0.901   0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 35 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.399  0.589   0.753   0.754  0.928   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4802) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.17 | 0.34 | [ 3.50, 4.84] | 12.16 | < .001
log within | 0.02 | 0.01 | [-0.01, 0.05] | 1.34 | 0.180
log between | 0.03 | 0.11 | [-0.18, 0.24] | 0.31 | 0.759
sex [M] | 0.48 | 0.22 | [ 0.05, 0.92] | 2.17 | 0.030
age | 0.03 | 6.85e-03 | [ 0.02, 0.04] | 4.38 | < .001
ms | -0.08 | 0.02 | [-0.12, -0.05] | -4.69 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.23
SD (Residual) | 1.06

```

```
=====
OUTCOME: energy
EXPOSURE: LAN_sunset_20
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.7917 -0.6094 0.0521 0.6092 7.5892

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.546 1.243
Residual 1.154 1.074
Number of obs: 5099, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.8456159 0.3765035 10.214
log_within 0.0165546 0.0115332 1.435
log_between 0.0413179 0.1194388 0.346
sexM 0.4675920 0.2213063 2.113
age 0.0276997 0.0067760 4.088
wakeupTime_dec 0.0004721 0.0133408 0.035

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.012
log_between -0.608 0.000
sexM -0.135 -0.001 0.010
age -0.713 0.002 0.088 -0.053
wakeupTm_dc -0.353 0.037 0.011 -0.022 0.070

Robustness weights for the residuals:
4024 weights are ~= 1. The remaining 1075 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.173 0.548 0.737 0.708 0.885 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.396 0.600 0.796 0.751 0.916 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5092)	p
(Intercept)	3.85	0.38	[3.11, 4.58]	10.21	< .001
log within	0.02	0.01	[-0.01, 0.04]	1.44	0.151
log between	0.04	0.12	[-0.19, 0.28]	0.35	0.729
sex [M]	0.47	0.22	[0.03, 0.90]	2.11	0.035
age	0.03	6.78e-03	[0.01, 0.04]	4.09	< .001
wakeupTime dec	4.72e-04	0.01	[-0.03, 0.03]	0.04	0.972

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.24
SD (Residual)	1.07

```
=====
OUTCOME: energy
EXPOSURE: LAN_0_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5206 -0.6143 0.0433 0.6050 7.3016

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.487 1.219
Residual 1.236 1.112
Number of obs: 5657, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.7121920 0.3081013 12.049
log_within -0.0166855 0.0082440 -2.024
log_between -0.1102665 0.0643511 -1.714
sexM 0.5098823 0.2175992 2.343
age 0.0286931 0.0066040 4.345
wakeupTime_dec 0.0002599 0.0132223 0.020

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.086
log_between 0.322 0.023
sexM -0.214 0.000 -0.169
age -0.750 -0.011 0.108 -0.061
wakeupTm_dc -0.453 -0.189 -0.121 0.002 0.056

Robustness weights for the residuals:
4449 weights are ~= 1. The remaining 1208 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.179 0.555 0.742 0.716 0.896 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.407 0.596 0.739 0.734 0.906 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5650)	p
(Intercept)	3.71	0.31	[3.11, 4.32]	12.05	< .001
log within	-0.02	8.24e-03	[-0.03, 0.00]	-2.02	0.043
log between	-0.11	0.06	[-0.24, 0.02]	-1.71	0.087
sex [M]	0.51	0.22	[0.08, 0.94]	2.34	0.019
age	0.03	6.60e-03	[0.02, 0.04]	4.34	< .001
wakeupTime dec	2.60e-04	0.01	[-0.03, 0.03]	0.02	0.984

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LAN_1_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5543 -0.6185 0.0409 0.5926 7.4460

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.499 1.224
Residual 1.223 1.106
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.614844 0.339703 10.641
log_within -0.042324 0.010356 -4.087
log_between -0.092127 0.075250 -1.224
sexM 0.479805 0.216327 2.218
age 0.029408 0.006635 4.432
wakeupTime_dec 0.003089 0.013086 0.236

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.068
log_between 0.510 0.017
sexM -0.197 0.001 -0.098
age -0.654 -0.009 0.117 -0.054
wakeupTm_dc -0.427 -0.160 -0.107 -0.009 0.055

Robustness weights for the residuals:
4451 weights are ~= 1. The remaining 1210 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.178 0.554 0.745 0.717 0.898 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.404 0.596 0.727 0.733 0.894 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.61	0.34	[2.95, 4.28]	10.64	< .001
log within	-0.04	0.01	[-0.06, -0.02]	-4.09	< .001
log between	-0.09	0.08	[-0.24, 0.06]	-1.22	0.221
sex [M]	0.48	0.22	[0.06, 0.90]	2.22	0.027
age	0.03	6.64e-03	[0.02, 0.04]	4.43	< .001
wakeupTime dec	3.09e-03	0.01	[-0.02, 0.03]	0.24	0.813

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LAN_2_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5462 -0.6205 0.0404 0.5980 5.6093

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.507 1.227
Residual 1.226 1.107
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.634670 0.378209 9.610
log_within -0.030174 0.013369 -2.257
log_between -0.079823 0.087555 -0.912
sexM 0.450979 0.215802 2.090
age 0.029539 0.006633 4.453
wakeupTime_dec 0.000582 0.013165 0.044

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.073
log_between 0.632 0.018
sexM -0.129 0.004 0.006
age -0.588 -0.011 0.089 -0.043
wakeupTm_dc -0.399 -0.183 -0.098 -0.020 0.059

Robustness weights for the residuals:
4467 weights are ~= 1. The remaining 1194 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.178 0.553 0.738 0.712 0.890 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.398 0.596 0.817 0.750 0.938 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.63	0.38	[2.89, 4.38]	9.61	< .001
log within	-0.03	0.01	[-0.06, 0.00]	-2.26	0.024
log between	-0.08	0.09	[-0.25, 0.09]	-0.91	0.362
sex [M]	0.45	0.22	[0.03, 0.87]	2.09	0.037
age	0.03	6.63e-03	[0.02, 0.04]	4.45	< .001
wakeupTime dec	5.82e-04	0.01	[-0.03, 0.03]	0.04	0.965

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.23
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LAN_3_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5307 -0.6146 0.0430 0.5982 7.5181

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.490 1.221
Residual 1.231 1.110
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.055010 0.462670 6.603
log_within -0.057913 0.016260 -3.562
log_between -0.242842 0.117831 -2.061
sexM 0.404346 0.215288 1.878
age 0.029665 0.006583 4.506
wakeupTime_dec 0.006432 0.013201 0.487

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.053
log_between 0.776 0.011
sexM -0.048 0.004 0.077
age -0.480 -0.010 0.058 -0.039
wakeupTm_dc -0.334 -0.158 -0.073 -0.025 0.065

Robustness weights for the residuals:
4457 weights are ~= 1. The remaining 1204 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.179 0.553 0.743 0.715 0.900 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 38 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.389 0.617 0.781 0.765 0.950 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	3.06	0.46	[2.15, 3.96]	6.60	< .001
log within	-0.06	0.02	[-0.09, -0.03]	-3.56	< .001
log between	-0.24	0.12	[-0.47, -0.01]	-2.06	0.039
sex [M]	0.40	0.22	[-0.02, 0.83]	1.88	0.060
age	0.03	6.58e-03	[0.02, 0.04]	4.51	< .001
wakeupTime dec	6.43e-03	0.01	[-0.02, 0.03]	0.49	0.626

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.11

```

=====
OUTCOME: energy
EXPOSURE: LAN_4_5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.5141 -0.6209  0.0417  0.5969  7.2621

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.456     1.207
Residual                   1.236     1.112
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.218786   0.523767   6.145
log_within     -0.043492   0.020006  -2.174
log_between    -0.200863   0.132888  -1.512
sexM            0.380455   0.214609   1.773
age             0.030422   0.006503   4.678
wakeupTime_dec -0.002503   0.013075  -0.191

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.027
log_between    0.834  0.004
sexM           0.029  0.003  0.147
age            -0.481 -0.007 -0.026 -0.047
wakeupTm_dc   -0.277 -0.099 -0.039 -0.025  0.071

Robustness weights for the residuals:
4456 weights are ~= 1. The remaining 1205 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.179  0.554  0.744  0.716  0.897  0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 38 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.382  0.601  0.780  0.754  0.944  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.22 | 0.52 | [ 2.19, 4.25] | 6.15 | < .001
log within | -0.04 | 0.02 | [-0.08, 0.00] | -2.17 | 0.030
log between | -0.20 | 0.13 | [-0.46, 0.06] | -1.51 | 0.131
sex [M] | 0.38 | 0.21 | [-0.04, 0.80] | 1.77 | 0.076
age | 0.03 | 6.50e-03 | [ 0.02, 0.04] | 4.68 | < .001
wakeupTime dec | -2.50e-03 | 0.01 | [-0.03, 0.02] | -0.19 | 0.848

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.21
SD (Residual) | 1.11

```

```

=====
OUTCOME: energy
EXPOSURE: LAN_5_sunrise
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.5255 -0.6135  0.0466  0.5982  7.4096

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.443     1.201
Residual                   1.232     1.110
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.815917   0.618550   4.552
log_within     -0.029606   0.022458  -1.318
log_between    -0.330759   0.164957  -2.005
sexM            0.350494   0.217316   1.613
age             0.031640   0.006517   4.855
wakeupTime_dec -0.008210   0.012963  -0.633

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.001
log_between    0.885  0.000
sexM           0.129  0.000  0.233
age            -0.489 -0.001 -0.117 -0.070
wakeupTm_dc   -0.183 -0.007  0.025 -0.013  0.067

Robustness weights for the residuals:
4451 weights are ~= 1. The remaining 1210 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.179  0.555   0.741   0.715  0.898   0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 36 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.372  0.602   0.747   0.741  0.929   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.82 | 0.62 | [ 1.60, 4.03] | 4.55 | < .001
log within | -0.03 | 0.02 | [-0.07, 0.01] | -1.32 | 0.187
log between | -0.33 | 0.16 | [-0.65, -0.01] | -2.01 | 0.045
sex [M] | 0.35 | 0.22 | [-0.08, 0.78] | 1.61 | 0.107
age | 0.03 | 6.52e-03 | [ 0.02, 0.04] | 4.86 | < .001
wakeupTime dec | -8.21e-03 | 0.01 | [-0.03, 0.02] | -0.63 | 0.527

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.20
SD (Residual) | 1.11

```



```
=====
OUTCOME: energy
EXPOSURE: LaW_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.1582 -0.6158 0.0369 0.6048 7.4453

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.370 1.170
Residual 1.235 1.111
Number of obs: 4982, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.535332 0.281967 16.085
log_within 0.021179 0.006698 3.162
log_between 0.077992 0.056859 1.372
sexM 0.439542 0.207774 2.115
age 0.026605 0.006500 4.093
ms -0.120098 0.017952 -6.690

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.036
log_between -0.219 0.001
sexM -0.155 0.003 -0.027
age -0.858 -0.007 0.122 -0.056
ms -0.369 -0.099 -0.012 -0.036 0.079

Robustness weights for the residuals:
3936 weights are ~= 1. The remaining 1046 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.181 0.571 0.742 0.720 0.900 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.380 0.587 0.780 0.746 0.952 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4975)	p
(Intercept)	4.54	0.28	[3.98, 5.09]	16.08	< .001
log within	0.02	6.70e-03	[0.01, 0.03]	3.16	0.002
log between	0.08	0.06	[-0.03, 0.19]	1.37	0.170
sex [M]	0.44	0.21	[0.03, 0.85]	2.12	0.034
age	0.03	6.50e-03	[0.01, 0.04]	4.09	< .001
ms	-0.12	0.02	[-0.16, -0.08]	-6.69	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.0703 -0.6107 0.0370 0.6014 7.4064

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.363 1.167
Residual 1.241 1.114
Number of obs: 4975, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.180514 0.326394 12.808
log_within 0.022398 0.007582 2.954
log_between 0.153679 0.063774 2.410
sexM 0.458009 0.207207 2.210
age 0.027551 0.006478 4.253
ms -0.119516 0.017932 -6.665

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.020
log_between -0.541 -0.001
sexM -0.135 0.002 -0.006
age -0.778 -0.004 0.113 -0.053
ms -0.324 -0.063 0.007 -0.036 0.081

Robustness weights for the residuals:
3924 weights are ~= 1. The remaining 1051 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.182 0.573 0.746 0.723 0.903 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.387 0.585 0.770 0.742 0.919 0.992

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4968)	p
(Intercept)	4.18	0.33	[3.54, 4.82]	12.81	< .001
log within	0.02	7.58e-03	[0.01, 0.04]	2.95	0.003
log between	0.15	0.06	[0.03, 0.28]	2.41	0.016
sex [M]	0.46	0.21	[0.05, 0.86]	2.21	0.027
age	0.03	6.48e-03	[0.01, 0.04]	4.25	< .001
ms	-0.12	0.02	[-0.15, -0.08]	-6.66	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.1193 -0.6180 0.0355 0.5987 7.4119

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.378 1.174
Residual 1.239 1.113
Number of obs: 4980, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.365294 0.304993 14.313
log_within 0.017737 0.007024 2.525
log_between 0.107880 0.058821 1.834
sexM 0.454488 0.208311 2.182
age 0.027362 0.006539 4.184
ms -0.117267 0.017979 -6.523

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.031
log_between -0.426 0.000
sexM -0.149 0.003 -0.001
age -0.829 -0.006 0.144 -0.052
ms -0.344 -0.093 -0.001 -0.037 0.080

Robustness weights for the residuals:
3928 weights are ~= 1. The remaining 1052 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.181 0.572 0.745 0.722 0.902 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.387 0.586 0.776 0.736 0.927 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4973)	p
(Intercept)	4.37	0.30	[3.77, 4.96]	14.31	< .001
log within	0.02	7.02e-03	[0.00, 0.03]	2.53	0.012
log between	0.11	0.06	[-0.01, 0.22]	1.83	0.067
sex [M]	0.45	0.21	[0.05, 0.86]	2.18	0.029
age	0.03	6.54e-03	[0.01, 0.04]	4.18	< .001
ms	-0.12	0.02	[-0.15, -0.08]	-6.52	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.9652 -0.6114 0.0387 0.6029 7.3742

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.401 1.184
Residual 1.244 1.115
Number of obs: 4954, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.146384 0.378170 10.964
log_within 0.042157 0.008925 4.724
log_between 0.137414 0.075575 1.818
sexM 0.446785 0.210022 2.127
age 0.026744 0.006541 4.089
ms -0.120949 0.018245 -6.629

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.018
log_between -0.677 -0.001
sexM -0.110 0.002 -0.017
age -0.678 -0.004 0.072 -0.053
ms -0.290 -0.064 0.016 -0.038 0.080

Robustness weights for the residuals:
3921 weights are ~= 1. The remaining 1033 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.182 0.573 0.738 0.721 0.901 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.381 0.594 0.790 0.760 0.963 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4947)	p
(Intercept)	4.15	0.38	[3.41, 4.89]	10.96	< .001
log within	0.04	8.92e-03	[0.02, 0.06]	4.72	< .001
log between	0.14	0.08	[-0.01, 0.29]	1.82	0.069
sex [M]	0.45	0.21	[0.04, 0.86]	2.13	0.033
age	0.03	6.54e-03	[0.01, 0.04]	4.09	< .001
ms	-0.12	0.02	[-0.16, -0.09]	-6.63	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	1.12

```
=====
OUTCOME: energy
EXPOSURE: LaW_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.0082 -0.6088 0.0387 0.6075 7.3936

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.384 1.176
Residual 1.243 1.115
Number of obs: 4961, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.158190 0.348673 11.926
log_within 0.031349 0.008166 3.839
log_between 0.143223 0.067672 2.116
sexM 0.441936 0.208795 2.117
age 0.027056 0.006516 4.152
ms -0.119114 0.018089 -6.585

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.609 -0.001
sexM -0.117 0.002 -0.023
age -0.737 -0.004 0.099 -0.055
ms -0.309 -0.057 0.013 -0.037 0.081

Robustness weights for the residuals:
3913 weights are ~= 1. The remaining 1048 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.182 0.576 0.742 0.724 0.909 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 37 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.382 0.583 0.796 0.764 0.951 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4954)	p
(Intercept)	4.16	0.35	[3.47, 4.84]	11.93	< .001
log within	0.03	8.17e-03	[0.02, 0.05]	3.84	< .001
log between	0.14	0.07	[0.01, 0.28]	2.12	0.034
sex [M]	0.44	0.21	[0.03, 0.85]	2.12	0.034
age	0.03	6.52e-03	[0.01, 0.04]	4.15	< .001
ms	-0.12	0.02	[-0.15, -0.08]	-6.58	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_3.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.9333 -0.6117 0.0418 0.6061 7.3687

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.426 1.194
Residual 1.238 1.113
Number of obs: 4934, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.139188 0.416837 9.930
log_within 0.053344 0.010482 5.089
log_between 0.119907 0.084462 1.420
sexM 0.423455 0.211895 1.998
age 0.026537 0.006581 4.032
ms -0.115083 0.018619 -6.181

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.015
log_between -0.739 -0.002
sexM -0.086 0.002 -0.034
age -0.598 -0.003 0.027 -0.053
ms -0.279 -0.053 0.029 -0.038 0.080

Robustness weights for the residuals:
3887 weights are ~= 1. The remaining 1047 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.183 0.574 0.744 0.726 0.909 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 37 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.380 0.613 0.810 0.765 0.957 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4927)	p
(Intercept)	4.14	0.42	[3.32, 4.96]	9.93	< .001
log within	0.05	0.01	[0.03, 0.07]	5.09	< .001
log between	0.12	0.08	[-0.05, 0.29]	1.42	0.156
sex [M]	0.42	0.21	[0.01, 0.84]	2.00	0.046
age	0.03	6.58e-03	[0.01, 0.04]	4.03	< .001
ms	-0.12	0.02	[-0.15, -0.08]	-6.18	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.9798 -0.6096 0.0388 0.6038 7.3810

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.414 1.189
Residual 1.241 1.114
Number of obs: 4946, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.101362 0.397638 10.314
log_within 0.044398 0.009678 4.587
log_between 0.141114 0.079807 1.768
sexM 0.432746 0.211018 2.051
age 0.026826 0.006562 4.088
ms -0.120874 0.018313 -6.600

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.712 -0.002
sexM -0.095 0.002 -0.029
age -0.639 -0.004 0.053 -0.054
ms -0.282 -0.060 0.021 -0.038 0.080

Robustness weights for the residuals:
3915 weights are ~= 1. The remaining 1031 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.182 0.572 0.739 0.721 0.901 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.380 0.605 0.794 0.760 0.961 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4939)	p
(Intercept)	4.10	0.40	[3.32, 4.88]	10.31	< .001
log within	0.04	9.68e-03	[0.03, 0.06]	4.59	< .001
log between	0.14	0.08	[-0.02, 0.30]	1.77	0.077
sex [M]	0.43	0.21	[0.02, 0.85]	2.05	0.040
age	0.03	6.56e-03	[0.01, 0.04]	4.09	< .001
ms	-0.12	0.02	[-0.16, -0.08]	-6.60	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_4.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.9999 -0.6124 0.0396 0.6058 7.3751

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.424 1.193
Residual 1.232 1.110
Number of obs: 4877, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.272532 0.446132 9.577
log_within 0.068470 0.011796 5.805
log_between 0.087032 0.091940 0.947
sexM 0.420617 0.211847 1.985
age 0.025778 0.006578 3.919
ms -0.117543 0.019335 -6.079

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.011
log_between -0.775 -0.001
sexM -0.087 0.002 -0.020
age -0.518 -0.003 -0.027 -0.052
ms -0.276 -0.040 0.040 -0.042 0.077

Robustness weights for the residuals:
3846 weights are ~= 1. The remaining 1031 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.182 0.574 0.748 0.724 0.904 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.380 0.612 0.815 0.758 0.960 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4870)	p
(Intercept)	4.27	0.45	[3.40, 5.15]	9.58	< .001
log within	0.07	0.01	[0.05, 0.09]	5.80	< .001
log between	0.09	0.09	[-0.09, 0.27]	0.95	0.344
sex [M]	0.42	0.21	[0.01, 0.84]	1.99	0.047
age	0.03	6.58e-03	[0.01, 0.04]	3.92	< .001
ms	-0.12	0.02	[-0.16, -0.08]	-6.08	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.11


```
=====
OUTCOME: energy
EXPOSURE: LaW_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.9258 -0.6096 0.0372 0.6070 7.3647

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.434 1.198
Residual 1.235 1.112
Number of obs: 4906, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.242918 0.435322 9.747
log_within 0.063244 0.011224 5.635
log_between 0.094560 0.088958 1.063
sexM 0.420703 0.212529 1.980
age 0.025922 0.006598 3.929
ms -0.116777 0.018994 -6.148

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.013
log_between -0.762 -0.002
sexM -0.088 0.002 -0.023
age -0.557 -0.003 0.003 -0.052
ms -0.273 -0.049 0.033 -0.042 0.077

Robustness weights for the residuals:
3867 weights are ~= 1. The remaining 1039 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.183 0.575 0.746 0.725 0.906 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.381 0.612 0.816 0.761 0.956 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4899)	p
(Intercept)	4.24	0.44	[3.39, 5.10]	9.75	< .001
log within	0.06	0.01	[0.04, 0.09]	5.63	< .001
log between	0.09	0.09	[-0.08, 0.27]	1.06	0.288
sex [M]	0.42	0.21	[0.00, 0.84]	1.98	0.048
age	0.03	6.60e-03	[0.01, 0.04]	3.93	< .001
ms	-0.12	0.02	[-0.15, -0.08]	-6.15	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_5.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.0501 -0.6182 0.0369 0.6041 6.0700

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.390 1.179
Residual 1.238 1.113
Number of obs: 4761, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.180099 0.470616 8.882
log_within 0.075690 0.013271 5.703
log_between 0.096863 0.096944 0.999
sexM 0.413908 0.209882 1.972
age 0.025895 0.006518 3.973
ms -0.111235 0.020624 -5.394

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between -0.801 0.000
sexM -0.098 0.000 0.003
age -0.477 0.000 -0.038 -0.051
ms -0.283 -0.006 0.049 -0.042 0.076

Robustness weights for the residuals:
3760 weights are ~= 1. The remaining 1001 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.222 0.574 0.745 0.725 0.904 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.374 0.605 0.752 0.738 0.903 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4754)	p
(Intercept)	4.18	0.47	[3.26, 5.10]	8.88	< .001
log within	0.08	0.01	[0.05, 0.10]	5.70	< .001
log between	0.10	0.10	[-0.09, 0.29]	1.00	0.318
sex [M]	0.41	0.21	[0.00, 0.83]	1.97	0.049
age	0.03	6.52e-03	[0.01, 0.04]	3.97	< .001
ms	-0.11	0.02	[-0.15, -0.07]	-5.39	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.0538 -0.6185  0.0403  0.6039  5.9518
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.409     1.187
Residual                   1.238     1.113
Number of obs: 4823, groups: id, 171
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.233749   0.455324   9.298
log_within   0.077583   0.012622   6.147
log_between  0.092868   0.093890   0.989
sexM         0.420684   0.210840   1.995
age          0.025735   0.006552   3.928
ms          -0.115197   0.019935  -5.779
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within  0.006
log_between -0.786 -0.001
sexM        -0.087  0.001 -0.017
age         -0.494 -0.002 -0.041 -0.052
ms          -0.280 -0.022  0.043 -0.042  0.077
```

```
Robustness weights for the residuals:
3811 weights are ~= 1. The remaining 1012 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.222  0.574   0.745   0.725  0.900   0.999
```

```
Robustness weights for the random effects:
136 weights are ~= 1. The remaining 35 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.378  0.606   0.788   0.748  0.927   0.995
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4816)	p
(Intercept)	4.23	0.46	[3.34, 5.13]	9.30	< .001
log within	0.08	0.01	[0.05, 0.10]	6.15	< .001
log between	0.09	0.09	[-0.09, 0.28]	0.99	0.323
sex [M]	0.42	0.21	[0.01, 0.83]	2.00	0.046
age	0.03	6.55e-03	[0.01, 0.04]	3.93	< .001
ms	-0.12	0.02	[-0.15, -0.08]	-5.78	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_6.5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.2157 -0.6146  0.0335  0.6118  6.3245
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.394    1.181
Residual                   1.207    1.099
Number of obs: 4580, groups: id, 171
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.311705   0.462337   9.326
log_within   0.088888   0.014686   6.052
log_between  0.070404   0.092645   0.760
sexM         0.425686   0.210762   2.020
age          0.026762   0.006533   4.096
ms          -0.129702   0.022195  -5.844
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.008
log_between -0.789  0.002
sexM        -0.126 -0.001  0.038
age         -0.478  0.002 -0.050 -0.054
ms          -0.294  0.027  0.047 -0.042  0.070
```

```
Robustness weights for the residuals:
3612 weights are ~= 1. The remaining 968 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.213  0.573   0.757   0.728  0.905   0.999
```

```
Robustness weights for the random effects:
136 weights are ~= 1. The remaining 35 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.376  0.600   0.804   0.746  0.921   0.986
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4573)	p
(Intercept)	4.31	0.46	[3.41, 5.22]	9.33	< .001
log within	0.09	0.01	[0.06, 0.12]	6.05	< .001
log between	0.07	0.09	[-0.11, 0.25]	0.76	0.447
sex [M]	0.43	0.21	[0.01, 0.84]	2.02	0.043
age	0.03	6.53e-03	[0.01, 0.04]	4.10	< .001
ms	-0.13	0.02	[-0.17, -0.09]	-5.84	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	1.10

```
=====
OUTCOME: energy
EXPOSURE: LaW_6
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.0932 -0.6160 0.0333 0.6090 6.1375

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.377 1.173
Residual 1.231 1.110
Number of obs: 4678, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.255300 0.457010 9.311
log_within 0.082067 0.013948 5.884
log_between 0.082680 0.091790 0.901
sexM 0.427982 0.209252 2.045
age 0.026271 0.006492 4.047
ms -0.122222 0.021446 -5.699

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.788 0.000
sexM -0.113 0.000 0.019
age -0.488 0.000 -0.041 -0.053
ms -0.296 0.002 0.051 -0.042 0.073

Robustness weights for the residuals:
3690 weights are ~= 1. The remaining 988 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.219 0.573 0.756 0.727 0.906 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.373 0.600 0.754 0.743 0.919 0.991

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4671)	p
(Intercept)	4.26	0.46	[3.36, 5.15]	9.31	< .001
log within	0.08	0.01	[0.05, 0.11]	5.88	< .001
log between	0.08	0.09	[-0.10, 0.26]	0.90	0.368
sex [M]	0.43	0.21	[0.02, 0.84]	2.05	0.041
age	0.03	6.49e-03	[0.01, 0.04]	4.05	< .001
ms	-0.12	0.02	[-0.16, -0.08]	-5.70	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	1.11

```
=====
OUTCOME: energy
EXPOSURE: LaW_7.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4712 -0.6050 0.0383 0.6077 5.1220

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.416 1.190
Residual 1.155 1.075
Number of obs: 4197, groups: id, 170

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.23763 0.48046 8.820
log_within 0.09070 0.01595 5.685
log_between 0.06741 0.09583 0.703
sexM 0.39463 0.21396 1.844
age 0.02879 0.00660 4.362
ms -0.12623 0.02482 -5.085

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.009
log_between -0.796 0.002
sexM -0.118 -0.001 0.032
age -0.471 0.002 -0.043 -0.056
ms -0.299 0.030 0.045 -0.043 0.063

Robustness weights for the residuals:
3320 weights are ~= 1. The remaining 877 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.208 0.566 0.753 0.723 0.910 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.376 0.592 0.826 0.750 0.922 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4190)	p
(Intercept)	4.24	0.48	[3.30, 5.18]	8.82	< .001
log within	0.09	0.02	[0.06, 0.12]	5.69	< .001
log between	0.07	0.10	[-0.12, 0.26]	0.70	0.482
sex [M]	0.39	0.21	[-0.02, 0.81]	1.84	0.065
age	0.03	6.60e-03	[0.02, 0.04]	4.36	< .001
ms	-0.13	0.02	[-0.17, -0.08]	-5.09	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.07

```
=====
OUTCOME: energy
EXPOSURE: LaW_7
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3766 -0.6134 0.0349 0.6054 5.0202

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.418 1.191
Residual 1.180 1.086
Number of obs: 4426, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.224923 0.471910 8.953
log_within 0.089469 0.015333 5.835
log_between 0.079631 0.094091 0.846
sexM 0.390333 0.213417 1.829
age 0.027461 0.006595 4.164
ms -0.122826 0.023211 -5.292

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.007
log_between -0.793 0.001
sexM -0.125 -0.001 0.038
age -0.476 0.002 -0.046 -0.055
ms -0.290 0.024 0.043 -0.041 0.064

Robustness weights for the residuals:
3492 weights are ~= 1. The remaining 934 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.211 0.573 0.758 0.726 0.906 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.376 0.589 0.816 0.747 0.914 0.988

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4419)	p
(Intercept)	4.22	0.47	[3.30, 5.15]	8.95	< .001
log within	0.09	0.02	[0.06, 0.12]	5.83	< .001
log between	0.08	0.09	[-0.10, 0.26]	0.85	0.397
sex [M]	0.39	0.21	[-0.03, 0.81]	1.83	0.067
age	0.03	6.59e-03	[0.01, 0.04]	4.16	< .001
ms	-0.12	0.02	[-0.17, -0.08]	-5.29	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.09

```
=====
OUTCOME: energy
EXPOSURE: LaW_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.5195 -0.6138 0.0420 0.5946 5.2390

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.489 1.220
Residual 1.141 1.068
Number of obs: 3836, groups: id, 166

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.091770 0.487614 8.391
log_within 0.089692 0.017082 5.251
log_between 0.090500 0.096760 0.935
sexM 0.416635 0.222580 1.872
age 0.028727 0.006798 4.226
ms -0.112374 0.027526 -4.083

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.014
log_between -0.785 0.002
sexM -0.127 -0.002 0.047
age -0.474 0.003 -0.048 -0.066
ms -0.310 0.043 0.041 -0.037 0.058

Robustness weights for the residuals:
3033 weights are ~= 1. The remaining 803 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.206 0.570 0.764 0.725 0.914 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.388 0.610 0.771 0.759 0.948 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3829)	p
(Intercept)	4.09	0.49	[3.14, 5.05]	8.39	< .001
log within	0.09	0.02	[0.06, 0.12]	5.25	< .001
log between	0.09	0.10	[-0.10, 0.28]	0.94	0.350
sex [M]	0.42	0.22	[-0.02, 0.85]	1.87	0.061
age	0.03	6.80e-03	[0.02, 0.04]	4.23	< .001
ms	-0.11	0.03	[-0.17, -0.06]	-4.08	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.07


```
=====
OUTCOME: energy
EXPOSURE: LaW_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.8878 -0.6243 0.0419 0.5903 4.6860

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.631 1.277
Residual 1.110 1.054
Number of obs: 4069, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.181997 0.503370 6.321
log_within 0.124446 0.017435 7.138
log_between 0.212998 0.102130 2.086
sexM 0.427243 0.229913 1.858
age 0.031626 0.006982 4.529
ms -0.053005 0.025226 -2.101

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.005
log_between -0.796 0.000
sexM -0.107 0.001 0.009
age -0.502 -0.001 -0.015 -0.051
ms -0.257 -0.022 0.029 -0.040 0.059

Robustness weights for the residuals:
3197 weights are ~= 1. The remaining 872 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.171 0.560 0.750 0.719 0.903 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.407 0.589 0.744 0.750 0.927 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4062)	p
(Intercept)	3.18	0.50	[2.20, 4.17]	6.32	< .001
log within	0.12	0.02	[0.09, 0.16]	7.14	< .001
log between	0.21	0.10	[0.01, 0.41]	2.09	0.037
sex [M]	0.43	0.23	[-0.02, 0.88]	1.86	0.063
age	0.03	6.98e-03	[0.02, 0.05]	4.53	< .001
ms	-0.05	0.03	[-0.10, 0.00]	-2.10	0.036

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.28
SD (Residual)	1.05

```
=====
OUTCOME: sadness
EXPOSURE: DAY_10_11
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5180 -0.5318 -0.1179 0.5485 9.0875

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.475 1.214
Residual 1.155 1.075
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.230231 0.308562 7.228
log_within -0.032032 0.007266 -4.408
log_between -0.093042 0.049122 -1.894
sexM -0.070421 0.213833 -0.329
age -0.013468 0.006820 -1.975
wakeupTime_dec -0.028418 0.013637 -2.084

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.184
log_between -0.322 0.055
sexM -0.182 -0.004 0.069
age -0.661 0.011 -0.287 -0.062
wakeupTm_dc -0.470 0.392 0.141 -0.011 0.028

Robustness weights for the residuals:
4368 weights are ~= 1. The remaining 1292 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.148 0.420 0.613 0.619 0.829 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.304 0.493 0.609 0.649 0.790 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	2.23	0.31	[1.63, 2.84]	7.23	< .001
log within	-0.03	7.27e-03	[-0.05, -0.02]	-4.41	< .001
log between	-0.09	0.05	[-0.19, 0.00]	-1.89	0.058
sex [M]	-0.07	0.21	[-0.49, 0.35]	-0.33	0.742
age	-0.01	6.82e-03	[-0.03, 0.00]	-1.97	0.048
wakeupTime dec	-0.03	0.01	[-0.06, 0.00]	-2.08	0.037

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.07

```

=====
OUTCOME: sadness
EXPOSURE: DAY_11_12
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.4539 -0.5263 -0.1153  0.5505  9.0745

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.465     1.21
Residual                   1.167     1.08
Number of obs: 5660, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.252918   0.340223   6.622
log_within     -0.028797   0.008096  -3.557
log_between    -0.099244   0.057843  -1.716
sexM            -0.058183   0.212815  -0.273
age            -0.013964   0.006704  -2.083
wakeupTime_dec -0.018352   0.013213  -1.389

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.135
log_between -0.524  0.038
sexM        -0.163 -0.005  0.034
age         -0.565  0.012 -0.238 -0.051
wakeupTm_dc -0.440  0.308  0.125 -0.016  0.038

Robustness weights for the residuals:
4373 weights are ~= 1. The remaining 1287 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.148  0.416  0.617  0.619  0.830  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.306  0.478  0.580  0.631  0.788  0.982

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5653) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.25 | 0.34 | [ 1.59, 2.92] | 6.62 | < .001
log within | -0.03 | 8.10e-03 | [-0.04, -0.01] | -3.56 | < .001
log between | -0.10 | 0.06 | [-0.21, 0.01] | -1.72 | 0.086
sex [M] | -0.06 | 0.21 | [-0.48, 0.36] | -0.27 | 0.785
age | -0.01 | 6.70e-03 | [-0.03, 0.00] | -2.08 | 0.037
wakeupTime dec | -0.02 | 0.01 | [-0.04, 0.01] | -1.39 | 0.165

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.21
SD (Residual) | 1.08

```

```
=====
OUTCOME: sadness
EXPOSURE: DAY_12_13
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4992 -0.5263 -0.1204 0.5471 9.0287

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.476 1.215
Residual 1.167 1.080
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.199005 0.392330 5.605
log_within -0.029950 0.009025 -3.319
log_between -0.079979 0.071316 -1.121
sexM -0.048284 0.213681 -0.226
age -0.015233 0.006648 -2.292
wakeupTime_dec -0.013063 0.012870 -1.015

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.083
log_between -0.676 0.023
sexM -0.157 -0.003 0.045
age -0.481 0.010 -0.184 -0.051
wakeupTm_dc -0.392 0.211 0.110 -0.013 0.046

Robustness weights for the residuals:
4380 weights are ~= 1. The remaining 1281 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.417 0.606 0.616 0.825 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.306 0.470 0.577 0.621 0.770 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	2.20	0.39	[1.43, 2.97]	5.60	< .001
log within	-0.03	9.02e-03	[-0.05, -0.01]	-3.32	< .001
log between	-0.08	0.07	[-0.22, 0.06]	-1.12	0.262
sex [M]	-0.05	0.21	[-0.47, 0.37]	-0.23	0.821
age	-0.02	6.65e-03	[-0.03, 0.00]	-2.29	0.022
wakeupTime dec	-0.01	0.01	[-0.04, 0.01]	-1.01	0.310

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: DAY_13_14
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5376 -0.5265 -0.1091 0.5409 9.0710

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.503 1.226
Residual 1.152 1.073
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.138430 0.455231 4.697
log_within -0.017332 0.008862 -1.956
log_between -0.074228 0.087805 -0.845
sexM -0.057434 0.215635 -0.266
age -0.015092 0.006665 -2.264
wakeupTime_dec -0.007649 0.012602 -0.607

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.048
log_between -0.770 0.011
sexM -0.154 -0.002 0.057
age -0.414 0.008 -0.149 -0.052
wakeupTm_dc -0.331 0.145 0.080 -0.014 0.053

Robustness weights for the residuals:
4375 weights are ~= 1. The remaining 1284 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.148 0.413 0.611 0.613 0.817 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.306 0.478 0.597 0.636 0.812 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	2.14	0.46	[1.25, 3.03]	4.70	< .001
log within	-0.02	8.86e-03	[-0.03, 0.00]	-1.96	0.051
log between	-0.07	0.09	[-0.25, 0.10]	-0.85	0.398
sex [M]	-0.06	0.22	[-0.48, 0.37]	-0.27	0.790
age	-0.02	6.66e-03	[-0.03, 0.00]	-2.26	0.024
wakeupTime dec	-7.65e-03	0.01	[-0.03, 0.02]	-0.61	0.544

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.23
SD (Residual)	1.07

```

=====
OUTCOME: sadness
EXPOSURE: DAY_14_15
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.5202 -0.5306 -0.1091  0.5391  9.0188

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.490    1.221
Residual                1.163    1.079
Number of obs: 5659, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)   1.763e+00  4.720e-01   3.736
log_within    -5.980e-03  8.157e-03  -0.733
log_between    5.798e-03  9.039e-02   0.064
sexM           -3.058e-02  2.152e-01  -0.142
age            -1.623e-02  6.579e-03  -2.468
wakeupTime_dec -5.407e-05  1.258e-02  -0.004

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.026
log_between -0.790  0.004
sexM        -0.170 -0.001  0.081
age         -0.460  0.006 -0.067 -0.049
wakeupTm_dc -0.297  0.088  0.046 -0.014  0.063

Robustness weights for the residuals:
4373 weights are ~= 1. The remaining 1286 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.149  0.415   0.609   0.617  0.827   0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.303  0.471   0.598   0.625  0.819   0.994

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5652) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.76 | 0.47 | [ 0.84, 2.69] | 3.74 | < .001
log within | -5.98e-03 | 8.16e-03 | [-0.02, 0.01] | -0.73 | 0.463
log between | 5.80e-03 | 0.09 | [-0.17, 0.18] | 0.06 | 0.949
sex [M] | -0.03 | 0.22 | [-0.45, 0.39] | -0.14 | 0.887
age | -0.02 | 6.58e-03 | [-0.03, 0.00] | -2.47 | 0.014
wakeupTime dec | -5.41e-05 | 0.01 | [-0.02, 0.02] | -4.30e-03 | 0.997

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.22
SD (Residual) | 1.08

```

```

=====
OUTCOME: sadness
EXPOSURE: DAY_15_16
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.8255 -0.5282 -0.1152  0.5437  9.0546

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.482     1.217
Residual                   1.156     1.075
Number of obs: 5659, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.073948   0.458640   4.522
log_within     -0.016506   0.008018  -2.059
log_between    -0.066488   0.085166  -0.781
sexM            -0.039251   0.213981  -0.183
age            -0.015867   0.006547  -2.424
wakeupTime_dec -0.003338   0.012516  -0.267

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.021
log_between -0.778  0.003
sexM        -0.136 -0.001  0.036
age         -0.540  0.004  0.016 -0.043
wakeupTm_dc -0.306  0.069  0.050 -0.017  0.067

Robustness weights for the residuals:
4382 weights are ~= 1. The remaining 1277 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.149  0.413  0.607  0.614  0.820  0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.301  0.465  0.574  0.611  0.739  0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5652) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.07 | 0.46 | [ 1.17, 2.97] | 4.52 | < .001
log within | -0.02 | 8.02e-03 | [-0.03, 0.00] | -2.06 | 0.040
log between | -0.07 | 0.09 | [-0.23, 0.10] | -0.78 | 0.435
sex [M] | -0.04 | 0.21 | [-0.46, 0.38] | -0.18 | 0.854
age | -0.02 | 6.55e-03 | [-0.03, 0.00] | -2.42 | 0.015
wakeupTime dec | -3.34e-03 | 0.01 | [-0.03, 0.02] | -0.27 | 0.790

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.22
SD (Residual) | 1.08

```

```
=====
OUTCOME: sadness
EXPOSURE: DAY_16_17
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4582 -0.5261 -0.1130 0.5412 9.0064

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.501 1.225
Residual 1.168 1.081
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.127211 0.438371 4.853
log_within -0.025010 0.008201 -3.050
log_between -0.086472 0.090219 -0.958
sexM -0.035640 0.215552 -0.165
age -0.015821 0.006586 -2.402
wakeupTime_dec -0.003767 0.012546 -0.300

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.022
log_between -0.750 0.003
sexM -0.069 -0.002 -0.060
age -0.556 0.005 0.001 -0.044
wakeupTm_dc -0.312 0.070 0.042 -0.021 0.067

Robustness weights for the residuals:
4380 weights are ~= 1. The remaining 1281 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.416 0.614 0.617 0.826 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.302 0.478 0.588 0.623 0.800 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	2.13	0.44	[1.27, 2.99]	4.85	< .001
log within	-0.03	8.20e-03	[-0.04, -0.01]	-3.05	0.002
log between	-0.09	0.09	[-0.26, 0.09]	-0.96	0.338
sex [M]	-0.04	0.22	[-0.46, 0.39]	-0.17	0.869
age	-0.02	6.59e-03	[-0.03, 0.00]	-2.40	0.016
wakeupTime dec	-3.77e-03	0.01	[-0.03, 0.02]	-0.30	0.764

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.23
SD (Residual)	1.08


```

=====
OUTCOME: sadness
EXPOSURE: DAY_17_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.5041 -0.5292 -0.1174  0.5419  9.0166

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.516     1.231
Residual                   1.166     1.080
Number of obs: 5655, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.979495   0.422306   4.687
log_within     -0.030884   0.008744  -3.532
log_between    -0.049428   0.105536  -0.468
sexM            -0.026923   0.217886  -0.124
age            -0.016341   0.006625  -2.467
wakeupTime_dec -0.004447   0.012549  -0.354

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.017
log_between -0.724  0.001
sexM        -0.030 -0.001 -0.123
age         -0.609  0.004  0.042 -0.048
wakeupTm_dc -0.310  0.056  0.027 -0.021  0.067

Robustness weights for the residuals:
4380 weights are ~= 1. The remaining 1275 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.149  0.423  0.605  0.615  0.824  0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.306  0.481  0.601  0.633  0.826  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5648) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.98 | 0.42 | [ 1.15, 2.81] | 4.69 | < .001
log within | -0.03 | 8.74e-03 | [-0.05, -0.01] | -3.53 | < .001
log between | -0.05 | 0.11 | [-0.26, 0.16] | -0.47 | 0.640
sex [M] | -0.03 | 0.22 | [-0.45, 0.40] | -0.12 | 0.902
age | -0.02 | 6.62e-03 | [-0.03, 0.00] | -2.47 | 0.014
wakeupTime dec | -4.45e-03 | 0.01 | [-0.03, 0.02] | -0.35 | 0.723

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.23
SD (Residual) | 1.08

```

```
=====
OUTCOME: sadness
EXPOSURE: DAY_8_9
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5459 -0.5110 -0.1108 0.5361 9.0211

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.498 1.224
Residual 1.158 1.076
Number of obs: 5662, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.862194 0.294440 6.325
log_within -0.010751 0.006788 -1.584
log_between -0.021038 0.046423 -0.453
sexM -0.045534 0.216277 -0.211
age -0.015758 0.006707 -2.349
wakeupTime_dec -0.009212 0.013741 -0.670

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.180
log_between 0.018 0.056
sexM -0.166 -0.002 0.112
age -0.818 0.017 -0.192 -0.064
wakeupTm_dc -0.446 0.402 0.140 -0.004 0.043

Robustness weights for the residuals:
4382 weights are ~= 1. The remaining 1280 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.414 0.610 0.614 0.822 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.303 0.476 0.594 0.628 0.826 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5655)	p
(Intercept)	1.86	0.29	[1.28, 2.44]	6.32	< .001
log within	-0.01	6.79e-03	[-0.02, 0.00]	-1.58	0.113
log between	-0.02	0.05	[-0.11, 0.07]	-0.45	0.650
sex [M]	-0.05	0.22	[-0.47, 0.38]	-0.21	0.833
age	-0.02	6.71e-03	[-0.03, 0.00]	-2.35	0.019
wakeupTime dec	-9.21e-03	0.01	[-0.04, 0.02]	-0.67	0.503

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: DAY_9_10
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5135 -0.5187 -0.1118 0.5438 9.0411

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.497 1.224
Residual 1.153 1.074
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.906973 0.299174 6.374
log_within -0.011400 0.006908 -1.650
log_between -0.030155 0.045090 -0.669
sexM -0.042168 0.215496 -0.196
age -0.015334 0.006785 -2.260
wakeupTime_dec -0.010844 0.014023 -0.773

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.210
log_between -0.155 0.066
sexM -0.177 -0.004 0.075
age -0.755 0.015 -0.244 -0.061
wakeupTm_dc -0.473 0.443 0.148 -0.009 0.034

Robustness weights for the residuals:
4371 weights are ~= 1. The remaining 1290 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.424 0.613 0.617 0.821 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.304 0.479 0.588 0.628 0.810 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	1.91	0.30	[1.32, 2.49]	6.37	< .001
log within	-0.01	6.91e-03	[-0.02, 0.00]	-1.65	0.099
log between	-0.03	0.05	[-0.12, 0.06]	-0.67	0.504
sex [M]	-0.04	0.22	[-0.46, 0.38]	-0.20	0.845
age	-0.02	6.79e-03	[-0.03, 0.00]	-2.26	0.024
wakeupTime dec	-0.01	0.01	[-0.04, 0.02]	-0.77	0.439

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.07

```
=====
OUTCOME: sadness
EXPOSURE: DAY_sunrise_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5769 -0.5266 -0.1044 0.5443 9.0740

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.492 1.222
Residual 1.147 1.071
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.812261 0.308430 5.876
log_within -0.001153 0.008916 -0.129
log_between 0.005338 0.063057 0.085
sexM -0.031739 0.215960 -0.147
age -0.016249 0.006589 -2.466
wakeupTime_dec -0.002005 0.012964 -0.155

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.100
log_between 0.333 0.027
sexM -0.122 -0.002 0.116
age -0.813 0.016 -0.081 -0.053
wakeupTm_dc -0.374 0.268 0.101 -0.008 0.060

Robustness weights for the residuals:
4371 weights are ~= 1. The remaining 1290 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.148 0.411 0.607 0.615 0.821 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.303 0.471 0.602 0.636 0.831 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	1.81	0.31	[1.21, 2.42]	5.88	< .001
log within	-1.15e-03	8.92e-03	[-0.02, 0.02]	-0.13	0.897
log between	5.34e-03	0.06	[-0.12, 0.13]	0.08	0.933
sex [M]	-0.03	0.22	[-0.46, 0.39]	-0.15	0.883
age	-0.02	6.59e-03	[-0.03, 0.00]	-2.47	0.014
wakeupTime dec	-2.01e-03	0.01	[-0.03, 0.02]	-0.15	0.877

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.07

```

=====
OUTCOME: sadness
EXPOSURE: LAN_0.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.5071 -0.5181 -0.1190  0.5253  8.4763

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.251     1.118
Residual                   1.108     1.053
Number of obs: 2255, groups: id, 139

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.087391   0.348710   5.986
log_within      0.014533   0.010362   1.402
log_between     0.069042   0.064928   1.063
sexM            0.083066   0.237834   0.349
age            -0.016683   0.007104  -2.348
ms             -0.082449   0.039693  -2.077

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.029
log_between 0.375 -0.002
sexM        -0.158 -0.004 -0.131
age         -0.816  0.005 -0.207 -0.046
ms_dia_sgnt -0.461  0.060 -0.048 -0.032  0.057

Robustness weights for the residuals:
1747 weights are ~= 1. The remaining 508 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.159  0.406  0.623  0.636  0.895  0.999

Robustness weights for the random effects:
116 weights are ~= 1. The remaining 23 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.276  0.445  0.473  0.581  0.677  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2248) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.09 | 0.35 | [ 1.40, 2.77] | 5.99 | < .001
log within | 0.01 | 0.01 | [-0.01, 0.03] | 1.40 | 0.161
log between | 0.07 | 0.06 | [-0.06, 0.20] | 1.06 | 0.288
sex [M] | 0.08 | 0.24 | [-0.38, 0.55] | 0.35 | 0.727
age | -0.02 | 7.10e-03 | [-0.03, 0.00] | -2.35 | 0.019
ms | -0.08 | 0.04 | [-0.16, 0.00] | -2.08 | 0.038

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.12
SD (Residual) | 1.05

```

```

=====
OUTCOME: sadness
EXPOSURE: LAN_1.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.5685 -0.5350 -0.1144  0.5500  9.6079

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.173     1.083
Residual                   1.037     1.018
Number of obs: 3382, groups: id, 151

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.9034988  0.2846658   6.687
log_within     -0.0009855  0.0090288  -0.109
log_between     0.0802916  0.0685630   1.171
sexM            -0.0080039  0.2113233  -0.038
age            -0.0164936  0.0063758  -2.587
ms             -0.0526502  0.0274983  -1.915

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.019
log_between 0.081 -0.003
sexM        -0.145  0.000 -0.129
age         -0.836  0.003 -0.085 -0.060
ms_dia_sgnt -0.447  0.046 -0.030 -0.026  0.074

Robustness weights for the residuals:
2634 weights are ~= 1. The remaining 748 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.140  0.397   0.613   0.620  0.855   0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.265  0.408   0.569   0.597  0.839   0.958

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3375) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.90 | 0.28 | [ 1.35, 2.46] | 6.69 | < .001
log within | -9.85e-04 | 9.03e-03 | [-0.02, 0.02] | -0.11 | 0.913
log between | 0.08 | 0.07 | [-0.05, 0.21] | 1.17 | 0.242
sex [M] | -8.00e-03 | 0.21 | [-0.42, 0.41] | -0.04 | 0.970
age | -0.02 | 6.38e-03 | [-0.03, 0.00] | -2.59 | 0.010
ms | -0.05 | 0.03 | [-0.11, 0.00] | -1.91 | 0.056

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.08
SD (Residual) | 1.02

```

```

=====
OUTCOME: sadness
EXPOSURE: LAN_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.5655 -0.5321 -0.1000  0.5494  9.3981

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.191     1.091
Residual                   1.076     1.037
Number of obs: 2829, groups: id, 145

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.970653   0.308222   6.394
log_within     -0.001848   0.009440  -0.196
log_between     0.097672   0.066561   1.467
sexM            0.023763   0.219666   0.108
age            -0.017754   0.006624  -2.680
ms             -0.043037   0.033072  -1.301

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.020
log_between   0.242 -0.002
sexM          -0.150  0.000 -0.103
age           -0.826  0.003 -0.155 -0.058
ms_dia_sgnt  -0.459  0.044 -0.037 -0.029  0.061

Robustness weights for the residuals:
2183 weights are ~= 1. The remaining 646 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.143  0.406  0.633  0.641  0.901  0.999

Robustness weights for the random effects:
120 weights are ~= 1. The remaining 25 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.264  0.415  0.586  0.581  0.753  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2822) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.97 | 0.31 | [ 1.37, 2.58] | 6.39 | < .001
log within | -1.85e-03 | 9.44e-03 | [-0.02, 0.02] | -0.20 | 0.845
log between | 0.10 | 0.07 | [-0.03, 0.23] | 1.47 | 0.142
sex [M] | 0.02 | 0.22 | [-0.41, 0.45] | 0.11 | 0.914
age | -0.02 | 6.62e-03 | [-0.03, 0.00] | -2.68 | 0.007
ms | -0.04 | 0.03 | [-0.11, 0.02] | -1.30 | 0.193

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.09
SD (Residual) | 1.04

```

```

=====
OUTCOME: sadness
EXPOSURE: LAN_2.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.7237 -0.5242 -0.1141  0.5437  9.6149

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.493     1.222
Residual                   1.040     1.020
Number of obs: 4093, groups: id, 160

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.8739766  0.3045283   6.154
log_within     -0.0007433  0.0093416  -0.080
log_between     0.1227080  0.0819804   1.497
sexM            -0.0259663  0.2271884  -0.114
age            -0.0176746  0.0069995  -2.525
ms             -0.0250839  0.0231640  -1.083

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.017
log_between -0.154 -0.003
sexM        -0.139  0.000 -0.106
age         -0.845  0.003 -0.001 -0.057
ms_dia_sgnt -0.382  0.047 -0.017 -0.022  0.072

Robustness weights for the residuals:
3183 weights are ~= 1. The remaining 910 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.140  0.402  0.602  0.607  0.812  0.998

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.296  0.452  0.511  0.581  0.691  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4086) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.87 | 0.30 | [ 1.28, 2.47] | 6.15 | < .001
log within | -7.43e-04 | 9.34e-03 | [-0.02, 0.02] | -0.08 | 0.937
log between | 0.12 | 0.08 | [-0.04, 0.28] | 1.50 | 0.135
sex [M] | -0.03 | 0.23 | [-0.47, 0.42] | -0.11 | 0.909
age | -0.02 | 7.00e-03 | [-0.03, 0.00] | -2.53 | 0.012
ms | -0.03 | 0.02 | [-0.07, 0.02] | -1.08 | 0.279

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.22
SD (Residual) | 1.02

```



```

=====
OUTCOME: sadness
EXPOSURE: LAN_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.7424 -0.5243 -0.1114  0.5663  9.6789

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.470     1.212
Residual                   1.027     1.013
Number of obs: 3762, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.889488   0.304285   6.210
log_within      0.001084   0.009131   0.119
log_between     0.136397   0.075850   1.798
sexM            -0.120124   0.231641  -0.519
age             -0.016129   0.007014  -2.299
ms             -0.038180   0.025162  -1.517

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.025
log_between -0.056 -0.004
sexM        -0.135 -0.001 -0.107
age         -0.848  0.004 -0.025 -0.069
ms_dia_sgnt -0.396  0.067 -0.033 -0.017  0.067

Robustness weights for the residuals:
2924 weights are ~= 1. The remaining 838 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.139  0.407   0.609   0.613  0.833   0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.294  0.479   0.662   0.650  0.865   0.991

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3755) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.89 | 0.30 | [ 1.29, 2.49] | 6.21 | < .001
log within | 1.08e-03 | 9.13e-03 | [-0.02, 0.02] | 0.12 | 0.905
log between | 0.14 | 0.08 | [-0.01, 0.29] | 1.80 | 0.072
sex [M] | -0.12 | 0.23 | [-0.57, 0.33] | -0.52 | 0.604
age | -0.02 | 7.01e-03 | [-0.03, 0.00] | -2.30 | 0.022
ms | -0.04 | 0.03 | [-0.09, 0.01] | -1.52 | 0.129

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.21
SD (Residual) | 1.01

```

```
=====
OUTCOME: sadness
EXPOSURE: LAN_20_21
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5207 -0.5154 -0.1139 0.5424 9.4812

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.508 1.228
Residual 1.066 1.033
Number of obs: 5092, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.7390088 0.3542311 4.909
log_within -0.0006429 0.0099946 -0.064
log_between -0.0089713 0.1066333 -0.084
sexM 0.0149698 0.2196535 0.068
age -0.0157972 0.0067110 -2.354
wakeupTime_dec 0.0007313 0.0127884 0.057

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.004
log_between -0.561 0.000
sexM -0.074 -0.001 -0.110
age -0.758 -0.002 0.125 -0.067
wakeupTm_dc -0.352 0.017 -0.002 -0.022 0.067

Robustness weights for the residuals:
3936 weights are ~= 1. The remaining 1156 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.142 0.413 0.612 0.609 0.808 0.998

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.304 0.463 0.578 0.611 0.800 0.985

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5085)	p
(Intercept)	1.74	0.35	[1.04, 2.43]	4.91	< .001
log within	-6.43e-04	9.99e-03	[-0.02, 0.02]	-0.06	0.949
log between	-8.97e-03	0.11	[-0.22, 0.20]	-0.08	0.933
sex [M]	0.01	0.22	[-0.42, 0.45]	0.07	0.946
age	-0.02	6.71e-03	[-0.03, 0.00]	-2.35	0.019
wakeupTime dec	7.31e-04	0.01	[-0.02, 0.03]	0.06	0.954

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.23
SD (Residual)	1.03

```
=====
OUTCOME: sadness
EXPOSURE: LAN_21_22
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-5.6533 -0.5345 -0.1132  0.5457  9.4475
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.478    1.216
Residual                1.075    1.037
Number of obs: 5106, groups: id, 168
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   1.643505   0.324182   5.070
log_within    -0.002692   0.009566  -0.281
log_between    0.067682   0.091296   0.741
sexM          -0.012511   0.218915  -0.057
age           -0.015567   0.006642  -2.344
wakeupTime_dec -0.001015   0.012889  -0.079
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.001
log_between -0.438 -0.004
sexM        -0.077 -0.001 -0.157
age         -0.798 -0.001  0.118 -0.071
wakeupTm_dc -0.377  0.012 -0.028 -0.018  0.065
```

```
Robustness weights for the residuals:
3947 weights are ~= 1. The remaining 1159 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.142  0.414   0.617   0.610  0.803   0.999
```

```
Robustness weights for the random effects:
139 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.295  0.462   0.556   0.607  0.803   0.994
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5099)	p
(Intercept)	1.64	0.32	[1.01, 2.28]	5.07	< .001
log within	-2.69e-03	9.57e-03	[-0.02, 0.02]	-0.28	0.778
log between	0.07	0.09	[-0.11, 0.25]	0.74	0.459
sex [M]	-0.01	0.22	[-0.44, 0.42]	-0.06	0.954
age	-0.02	6.64e-03	[-0.03, 0.00]	-2.34	0.019
wakeupTime dec	-1.02e-03	0.01	[-0.03, 0.02]	-0.08	0.937

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.04

```

=====
OUTCOME: sadness
EXPOSURE: LAN_22_23
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.6103 -0.5280 -0.1029  0.5448  9.4422

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.471     1.213
Residual                   1.077     1.038
Number of obs: 5101, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.696589   0.296267   5.727
log_within     -0.006718   0.008159  -0.823
log_between     0.069885   0.070816   0.987
sexM            -0.045773   0.220524  -0.208
age            -0.015330   0.006632  -2.312
wakeupTime_dec -0.001781   0.012911  -0.138

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.002
log_between -0.189 -0.001
sexM        -0.118  0.002 -0.207
age         -0.838 -0.001  0.123 -0.078
wakeupTm_dc -0.412  0.005 -0.068 -0.008  0.060

Robustness weights for the residuals:
3940 weights are ~= 1. The remaining 1161 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.142  0.412  0.616  0.612  0.813  0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.292  0.460  0.548  0.607  0.791  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5094) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.70 | 0.30 | [ 1.12, 2.28] | 5.73 | < .001
log within | -6.72e-03 | 8.16e-03 | [-0.02, 0.01] | -0.82 | 0.410
log between | 0.07 | 0.07 | [-0.07, 0.21] | 0.99 | 0.324
sex [M] | -0.05 | 0.22 | [-0.48, 0.39] | -0.21 | 0.836
age | -0.02 | 6.63e-03 | [-0.03, 0.00] | -2.31 | 0.021
wakeupTime dec | -1.78e-03 | 0.01 | [-0.03, 0.02] | -0.14 | 0.890

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.21
SD (Residual) | 1.04

```

```

=====
OUTCOME: sadness
EXPOSURE: LAN_23_0
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.6373 -0.5219 -0.0995  0.5398  9.4904

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.537     1.240
Residual                   1.064     1.032
Number of obs: 5096, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.803068   0.296661   6.078
log_within     0.002784   0.007513   0.371
log_between    0.058835   0.061443   0.958
sexM           -0.049118   0.227765  -0.216
age            -0.015703   0.006760  -2.323
wakeupTime_dec -0.002842   0.012888  -0.221

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.017
log_between 0.082  0.002
sexM        -0.180  0.000 -0.254
age         -0.821 -0.004  0.109 -0.079
wakeupTm_dc -0.429 -0.036 -0.099  0.004  0.056

Robustness weights for the residuals:
3936 weights are ~= 1. The remaining 1160 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.142  0.407   0.612   0.608  0.803   0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.305  0.473   0.554   0.609  0.801   0.919

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5089) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.80 | 0.30 | [ 1.22, 2.38] | 6.08 | < .001
log within | 2.78e-03 | 7.51e-03 | [-0.01, 0.02] | 0.37 | 0.711
log between | 0.06 | 0.06 | [-0.06, 0.18] | 0.96 | 0.338
sex [M] | -0.05 | 0.23 | [-0.50, 0.40] | -0.22 | 0.829
age | -0.02 | 6.76e-03 | [-0.03, 0.00] | -2.32 | 0.020
wakeupTime dec | -2.84e-03 | 0.01 | [-0.03, 0.02] | -0.22 | 0.825

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.24
SD (Residual) | 1.03

```

```

=====
OUTCOME: sadness
EXPOSURE: LAN_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.6573 -0.5290 -0.1117  0.5418  9.4853

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.430     1.196
Residual                   1.062     1.031
Number of obs: 4262, groups: id, 164

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.849309   0.297672   6.213
log_within     -0.009238   0.010025  -0.922
log_between     0.053074   0.081604   0.650
sexM            0.027831   0.220360   0.126
age            -0.017550   0.006735  -2.606
ms             -0.022725   0.022058  -1.030

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.026
log_between  -0.220 -0.004
sexM         -0.119  0.000 -0.097
age         -0.834  0.005  0.006 -0.074
ms_dia_sgnt -0.382  0.071 -0.026 -0.024  0.077

Robustness weights for the residuals:
3305 weights are ~= 1. The remaining 957 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.142  0.406  0.608  0.611  0.815  0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.294  0.457  0.501  0.592  0.718  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4255) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.85 | 0.30 | [ 1.27, 2.43] | 6.21 | < .001
log within | -9.24e-03 | 0.01 | [-0.03, 0.01] | -0.92 | 0.357
log between | 0.05 | 0.08 | [-0.11, 0.21] | 0.65 | 0.515
sex [M] | 0.03 | 0.22 | [-0.40, 0.46] | 0.13 | 0.900
age | -0.02 | 6.73e-03 | [-0.03, 0.00] | -2.61 | 0.009
ms | -0.02 | 0.02 | [-0.07, 0.02] | -1.03 | 0.303

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.20
SD (Residual) | 1.03

```

```

=====
OUTCOME: sadness
EXPOSURE: LAN_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.8381 -0.5183 -0.1022  0.5389  9.4685

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.489     1.22
Residual                   1.062     1.03
Number of obs: 4809, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.657024   0.338619   4.893
log_within      0.006285   0.014217   0.442
log_between     0.021274   0.104958   0.203
sexM            0.058996   0.219690   0.269
age            -0.016268   0.006783  -2.398
ms              0.011152   0.017066   0.653

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.003
log_between   -0.545 -0.001
sexM          -0.100  0.001 -0.053
age           -0.781 -0.001  0.108 -0.076
ms_dia_sgnt  -0.278  0.000 -0.022 -0.036  0.078

Robustness weights for the residuals:
3713 weights are ~= 1. The remaining 1096 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.142  0.408  0.620  0.615  0.821  0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.300  0.466  0.570  0.624  0.817  0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4802) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.66 | 0.34 | [ 0.99, 2.32] | 4.89 | < .001
log within | 6.28e-03 | 0.01 | [-0.02, 0.03] | 0.44 | 0.658
log between | 0.02 | 0.10 | [-0.18, 0.23] | 0.20 | 0.839
sex [M] | 0.06 | 0.22 | [-0.37, 0.49] | 0.27 | 0.788
age | -0.02 | 6.78e-03 | [-0.03, 0.00] | -2.40 | 0.017
ms | 0.01 | 0.02 | [-0.02, 0.04] | 0.65 | 0.513

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.22
SD (Residual) | 1.03

```

```
=====
OUTCOME: sadness
EXPOSURE: LAN_sunset_20
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.6097 -0.5248 -0.1194 0.5577 9.4118

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.502 1.225
Residual 1.077 1.038
Number of obs: 5099, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.782866 0.369908 4.820
log_within 0.026468 0.011143 2.375
log_between -0.032682 0.117623 -0.278
sexM 0.005359 0.217952 0.025
age -0.016046 0.006672 -2.405
wakeupTime_dec 0.002155 0.012899 0.167

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.012
log_between -0.609 0.000
sexM -0.136 -0.001 0.010
age -0.714 0.002 0.088 -0.053
wakeupTm_dc -0.348 0.037 0.011 -0.022 0.069

Robustness weights for the residuals:
3954 weights are ~= 1. The remaining 1145 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.143 0.406 0.612 0.606 0.800 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.303 0.467 0.577 0.610 0.795 0.983

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5092)	p
(Intercept)	1.78	0.37	[1.06, 2.51]	4.82	< .001
log within	0.03	0.01	[0.00, 0.05]	2.38	0.018
log between	-0.03	0.12	[-0.26, 0.20]	-0.28	0.781
sex [M]	5.36e-03	0.22	[-0.42, 0.43]	0.02	0.980
age	-0.02	6.67e-03	[-0.03, 0.00]	-2.40	0.016
wakeupTime dec	2.16e-03	0.01	[-0.02, 0.03]	0.17	0.867

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.23
SD (Residual)	1.04


```

=====
OUTCOME: sadness
EXPOSURE: LAN_0_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.5565 -0.5286 -0.1056  0.5471  9.0430

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.526     1.235
Residual                   1.155     1.075
Number of obs: 5657, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.8680953  0.3087594   6.050
log_within     -0.0025407  0.0079702  -0.319
log_between     0.0528607  0.0649465   0.814
sexM            -0.0675537  0.2200359  -0.307
age            -0.0155731  0.0066778  -2.332
wakeupTime_dec -0.0004389  0.0127950  -0.034

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.083
log_between    0.320  0.022
sexM          -0.216  0.000 -0.169
age           -0.755 -0.010  0.108 -0.061
wakeupTm_dc -0.438 -0.189 -0.116  0.002  0.053

Robustness weights for the residuals:
4366 weights are ~= 1. The remaining 1291 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.149  0.412  0.616  0.617  0.823  0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.314  0.474  0.633  0.656  0.825  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5650) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.87 | 0.31 | [ 1.26, 2.47] | 6.05 | < .001
log within | -2.54e-03 | 7.97e-03 | [-0.02, 0.01] | -0.32 | 0.750
log between | 0.05 | 0.06 | [-0.07, 0.18] | 0.81 | 0.416
sex [M] | -0.07 | 0.22 | [-0.50, 0.36] | -0.31 | 0.759
age | -0.02 | 6.68e-03 | [-0.03, 0.00] | -2.33 | 0.020
wakeupTime dec | -4.39e-04 | 0.01 | [-0.03, 0.02] | -0.03 | 0.973

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.24
SD (Residual) | 1.07

```

```

=====
OUTCOME: sadness
EXPOSURE: LAN_1_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-5.5825 -0.5242 -0.1075  0.5451  9.0651

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.485     1.219
Residual                   1.145     1.070
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.043573   0.335965   6.083
log_within      0.011283   0.010019   1.126
log_between     0.102884   0.074704   1.377
sexM            -0.063004   0.215095  -0.293
age            -0.014979   0.006598  -2.270
wakeupTime_dec -0.004460   0.012668  -0.352

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.067
log_between    0.510  0.017
sexM          -0.198  0.001 -0.098
age           -0.656 -0.009  0.117 -0.054
wakeupTm_dc -0.418 -0.160 -0.104 -0.008  0.054

Robustness weights for the residuals:
4376 weights are ~= 1. The remaining 1285 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.148  0.412  0.607  0.615  0.815  0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.311  0.464  0.591  0.646  0.853  0.988

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.04 | 0.34 | [ 1.38, 2.70] | 6.08 | < .001
log within | 0.01 | 0.01 | [-0.01, 0.03] | 1.13 | 0.260
log between | 0.10 | 0.07 | [-0.04, 0.25] | 1.38 | 0.168
sex [M] | -0.06 | 0.22 | [-0.48, 0.36] | -0.29 | 0.770
age | -0.01 | 6.60e-03 | [-0.03, 0.00] | -2.27 | 0.023
wakeupTime dec | -4.46e-03 | 0.01 | [-0.03, 0.02] | -0.35 | 0.725

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.22
SD (Residual) | 1.07

```

=====
OUTCOME: sadness
EXPOSURE: LAN_2_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5578 -0.5255 -0.1054 0.5506 9.0326

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.477 1.215
Residual 1.157 1.076
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.021895 0.372913 5.422
log_within -0.003757 0.012988 -0.289
log_between 0.086974 0.086508 1.005
sexM -0.035290 0.213521 -0.165
age -0.015495 0.006563 -2.361
wakeupTime_dec -0.001193 0.012795 -0.093

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.072
log_between 0.632 0.018
sexM -0.130 0.004 0.006
age -0.589 -0.011 0.090 -0.043
wakeupTm_dc -0.393 -0.183 -0.096 -0.020 0.058

Robustness weights for the residuals:
4372 weights are ~= 1. The remaining 1289 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.413 0.612 0.616 0.824 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.308 0.466 0.612 0.658 0.875 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
(Intercept) | 2.02 | 0.37 | [1.29, 2.75] | 5.42 | < .001
log within | -3.76e-03 | 0.01 | [-0.03, 0.02] | -0.29 | 0.772
log between | 0.09 | 0.09 | [-0.08, 0.26] | 1.01 | 0.315
sex [M] | -0.04 | 0.21 | [-0.45, 0.38] | -0.17 | 0.869
age | -0.02 | 6.56e-03 | [-0.03, 0.00] | -2.36 | 0.018
wakeupTime dec | -1.19e-03 | 0.01 | [-0.03, 0.02] | -0.09 | 0.926

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 1.22
SD (Residual) | 1.08

```

=====
OUTCOME: sadness
EXPOSURE: LAN_3_4
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.5612 -0.5247 -0.1048  0.5446  9.0602

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.479     1.216
Residual                   1.150     1.072
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.225084   0.458538   4.853
log_within      0.007303   0.015716   0.465
log_between     0.138216   0.117077   1.181
sexM            -0.017806   0.214254  -0.083
age            -0.015427   0.006551  -2.355
wakeupTime_dec -0.004339   0.012770  -0.340

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.052
log_between 0.776  0.011
sexM        -0.048  0.004  0.077
age         -0.481 -0.010  0.059 -0.039
wakeupTm_dc -0.326 -0.158 -0.071 -0.024  0.063

Robustness weights for the residuals:
4376 weights are ~= 1. The remaining 1285 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.148  0.413  0.611  0.614  0.820  0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.306  0.467  0.615  0.656  0.869  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.23 | 0.46 | [ 1.33, 3.12] | 4.85 | < .001
log within | 7.30e-03 | 0.02 | [-0.02, 0.04] | 0.46 | 0.642
log between | 0.14 | 0.12 | [-0.09, 0.37] | 1.18 | 0.238
sex [M] | -0.02 | 0.21 | [-0.44, 0.40] | -0.08 | 0.934
age | -0.02 | 6.55e-03 | [-0.03, 0.00] | -2.35 | 0.019
wakeupTime dec | -4.34e-03 | 0.01 | [-0.03, 0.02] | -0.34 | 0.734

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.22
SD (Residual) | 1.07

```

```
=====
OUTCOME: sadness
EXPOSURE: LAN_4_5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-5.5654 -0.5249 -0.1087  0.5379  9.0717
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.455    1.206
Residual                   1.150    1.072
Number of obs: 5661, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   2.414090   0.521340   4.631
log_within     0.028859   0.019296   1.496
log_between    0.181659   0.132586   1.370
sexM           0.012028   0.214256   0.056
age           -0.015864   0.006491  -2.444
wakeupTime_dec -0.006835   0.012626  -0.541
```

```
Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.027
log_between    0.835  0.004
sexM           0.029  0.003  0.147
age           -0.481 -0.007 -0.025 -0.047
wakeupTm_dc -0.269 -0.099 -0.038 -0.024  0.069
```

```
Robustness weights for the residuals:
4385 weights are ~= 1. The remaining 1276 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.148  0.413  0.607  0.613  0.816  0.999
```

```
Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.302  0.455  0.586  0.632  0.843  0.996
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	2.41	0.52	[1.39, 3.44]	4.63	< .001
log within	0.03	0.02	[-0.01, 0.07]	1.50	0.135
log between	0.18	0.13	[-0.08, 0.44]	1.37	0.171
sex [M]	0.01	0.21	[-0.41, 0.43]	0.06	0.955
age	-0.02	6.49e-03	[-0.03, 0.00]	-2.44	0.015
wakeupTime dec	-6.84e-03	0.01	[-0.03, 0.02]	-0.54	0.588

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.07

```
=====
OUTCOME: sadness
EXPOSURE: LAN_5_sunrise
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5318 -0.5226 -0.1025 0.5310 9.0228

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.488 1.220
Residual 1.159 1.077
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.495146 0.625795 3.987
log_within 0.022532 0.021790 1.034
log_between 0.210705 0.167089 1.261
sexM 0.028079 0.220331 0.127
age -0.016509 0.006606 -2.499
wakeupTime_dec -0.002696 0.012597 -0.214

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between 0.887 0.000
sexM 0.129 0.000 0.233
age -0.488 -0.001 -0.117 -0.070
wakeupTm_dc -0.176 -0.007 0.024 -0.013 0.064

Robustness weights for the residuals:
4376 weights are ~= 1. The remaining 1285 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.414 0.617 0.618 0.825 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.304 0.462 0.628 0.644 0.852 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	2.50	0.63	[1.27, 3.72]	3.99	< .001
log within	0.02	0.02	[-0.02, 0.07]	1.03	0.301
log between	0.21	0.17	[-0.12, 0.54]	1.26	0.207
sex [M]	0.03	0.22	[-0.40, 0.46]	0.13	0.899
age	-0.02	6.61e-03	[-0.03, 0.00]	-2.50	0.012
wakeupTime dec	-2.70e-03	0.01	[-0.03, 0.02]	-0.21	0.831

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4895 -0.5347 -0.1152 0.5367 9.0772

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.455 1.206
Residual 1.144 1.070
Number of obs: 4982, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.626403 0.287482 5.657
log_within -0.013983 0.006448 -2.169
log_between 0.083047 0.058383 1.422
sexM -0.070405 0.213462 -0.330
age -0.015588 0.006676 -2.335
ms 0.017134 0.017340 0.988

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.034
log_between -0.221 0.001
sexM -0.158 0.003 -0.027
age -0.861 -0.006 0.123 -0.055
ms -0.349 -0.099 -0.011 -0.034 0.074

Robustness weights for the residuals:
3829 weights are ~= 1. The remaining 1153 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.148 0.416 0.619 0.621 0.840 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.315 0.479 0.618 0.665 0.843 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4975)	p
(Intercept)	1.63	0.29	[1.06, 2.19]	5.66	< .001
log within	-0.01	6.45e-03	[-0.03, 0.00]	-2.17	0.030
log between	0.08	0.06	[-0.03, 0.20]	1.42	0.155
sex [M]	-0.07	0.21	[-0.49, 0.35]	-0.33	0.742
age	-0.02	6.68e-03	[-0.03, 0.00]	-2.33	0.020
ms	0.02	0.02	[-0.02, 0.05]	0.99	0.323

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.07

```
=====
OUTCOME: sadness
EXPOSURE: LaW_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4299 -0.5321 -0.1121 0.5340 9.0351

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.457 1.207
Residual 1.156 1.075
Number of obs: 4975, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.7090467 0.3345021 5.109
log_within -0.0177435 0.0073179 -2.425
log_between -0.0003558 0.0657393 -0.005
sexM -0.0616766 0.2135975 -0.289
age -0.0164950 0.0066759 -2.471
ms 0.0163104 0.0173675 0.939

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.019
log_between -0.544 -0.001
sexM -0.138 0.002 -0.007
age -0.780 -0.004 0.113 -0.053
ms -0.307 -0.064 0.007 -0.034 0.076

Robustness weights for the residuals:
3826 weights are ~= 1. The remaining 1149 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.416 0.620 0.621 0.840 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.302 0.468 0.578 0.619 0.812 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4968)	p
(Intercept)	1.71	0.33	[1.05, 2.36]	5.11	< .001
log within	-0.02	7.32e-03	[-0.03, 0.00]	-2.42	0.015
log between	-3.56e-04	0.07	[-0.13, 0.13]	-5.41e-03	0.996
sex [M]	-0.06	0.21	[-0.48, 0.36]	-0.29	0.773
age	-0.02	6.68e-03	[-0.03, 0.00]	-2.47	0.014
ms	0.02	0.02	[-0.02, 0.05]	0.94	0.348

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.08


```
=====
OUTCOME: sadness
EXPOSURE: LaW_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4959 -0.5326 -0.1188 0.5377 9.0522

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.454 1.206
Residual 1.147 1.071
Number of obs: 4980, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.649036 0.310349 5.313
log_within -0.017682 0.006756 -2.617
log_between 0.018631 0.060201 0.309
sexM -0.061849 0.213315 -0.290
age -0.016193 0.006694 -2.419
ms 0.019581 0.017351 1.129

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.030
log_between -0.429 0.000
sexM -0.151 0.003 -0.001
age -0.832 -0.006 0.145 -0.052
ms -0.326 -0.093 -0.001 -0.034 0.075

Robustness weights for the residuals:
3833 weights are ~= 1. The remaining 1147 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.412 0.618 0.619 0.837 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.304 0.467 0.579 0.619 0.818 0.991

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4973)	p
(Intercept)	1.65	0.31	[1.04, 2.26]	5.31	< .001
log within	-0.02	6.76e-03	[-0.03, 0.00]	-2.62	0.009
log between	0.02	0.06	[-0.10, 0.14]	0.31	0.757
sex [M]	-0.06	0.21	[-0.48, 0.36]	-0.29	0.772
age	-0.02	6.69e-03	[-0.03, 0.00]	-2.42	0.016
ms	0.02	0.02	[-0.01, 0.05]	1.13	0.259

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.07

```
=====
OUTCOME: sadness
EXPOSURE: LaW_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4163 -0.5242 -0.1126 0.5345 9.0409

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.459 1.208
Residual 1.165 1.079
Number of obs: 4954, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.792615 0.383576 4.673
log_within -0.028328 0.008637 -3.280
log_between -0.021169 0.076944 -0.275
sexM -0.058921 0.213842 -0.276
age -0.016698 0.006658 -2.508
ms 0.014686 0.017703 0.830

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.679 -0.001
sexM -0.111 0.002 -0.017
age -0.679 -0.004 0.072 -0.053
ms -0.278 -0.064 0.015 -0.036 0.076

Robustness weights for the residuals:
3810 weights are ~= 1. The remaining 1144 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.418 0.620 0.623 0.843 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.302 0.469 0.582 0.620 0.791 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4947)	p
(Intercept)	1.79	0.38	[1.04, 2.54]	4.67	< .001
log within	-0.03	8.64e-03	[-0.05, -0.01]	-3.28	0.001
log between	-0.02	0.08	[-0.17, 0.13]	-0.28	0.783
sex [M]	-0.06	0.21	[-0.48, 0.36]	-0.28	0.783
age	-0.02	6.66e-03	[-0.03, 0.00]	-2.51	0.012
ms	0.01	0.02	[-0.02, 0.05]	0.83	0.407

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4106 -0.5282 -0.1106 0.5301 9.0340

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.452 1.205
Residual 1.165 1.079
Number of obs: 4961, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.755501 0.354515 4.952
log_within -0.022604 0.007908 -2.858
log_between -0.014614 0.069084 -0.212
sexM -0.055436 0.213316 -0.260
age -0.016676 0.006655 -2.506
ms 0.015985 0.017564 0.910

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.016
log_between -0.611 -0.001
sexM -0.118 0.002 -0.024
age -0.739 -0.004 0.100 -0.054
ms -0.296 -0.058 0.013 -0.035 0.077

Robustness weights for the residuals:
3813 weights are ~= 1. The remaining 1148 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.418 0.621 0.623 0.843 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.301 0.468 0.579 0.619 0.806 0.991

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4954)	p
(Intercept)	1.76	0.35	[1.06, 2.45]	4.95	< .001
log within	-0.02	7.91e-03	[-0.04, -0.01]	-2.86	0.004
log between	-0.01	0.07	[-0.15, 0.12]	-0.21	0.832
sex [M]	-0.06	0.21	[-0.47, 0.36]	-0.26	0.795
age	-0.02	6.65e-03	[-0.03, 0.00]	-2.51	0.012
ms	0.02	0.02	[-0.02, 0.05]	0.91	0.363

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_3.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4254 -0.5263 -0.1143 0.5498 9.0306

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.445 1.202
Residual 1.159 1.077
Number of obs: 4934, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.801801 0.417551 4.315
log_within -0.029639 0.010140 -2.923
log_between -0.018816 0.084810 -0.222
sexM -0.075335 0.212911 -0.354
age -0.016573 0.006611 -2.507
ms 0.012077 0.018046 0.669

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.014
log_between -0.740 -0.002
sexM -0.086 0.002 -0.035
age -0.598 -0.003 0.027 -0.053
ms -0.270 -0.053 0.028 -0.037 0.077

Robustness weights for the residuals:
3810 weights are ~= 1. The remaining 1124 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.414 0.610 0.617 0.835 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.300 0.467 0.581 0.626 0.783 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4927)	p
(Intercept)	1.80	0.42	[0.98, 2.62]	4.32	< .001
log within	-0.03	0.01	[-0.05, -0.01]	-2.92	0.003
log between	-0.02	0.08	[-0.19, 0.15]	-0.22	0.824
sex [M]	-0.08	0.21	[-0.49, 0.34]	-0.35	0.723
age	-0.02	6.61e-03	[-0.03, 0.00]	-2.51	0.012
ms	0.01	0.02	[-0.02, 0.05]	0.67	0.503

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4132 -0.5197 -0.1118 0.5365 9.0324

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.463 1.209
Residual 1.164 1.079
Number of obs: 4946, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.806564 0.402131 4.492
log_within -0.027554 0.009374 -2.939
log_between -0.021077 0.080964 -0.260
sexM -0.068552 0.214148 -0.320
age -0.016663 0.006657 -2.503
ms 0.013466 0.017780 0.757

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.016
log_between -0.713 -0.001
sexM -0.096 0.002 -0.030
age -0.640 -0.004 0.053 -0.053
ms -0.271 -0.061 0.020 -0.036 0.076

Robustness weights for the residuals:
3822 weights are ~= 1. The remaining 1124 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.410 0.612 0.616 0.837 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.303 0.471 0.584 0.633 0.787 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4939)	p
(Intercept)	1.81	0.40	[1.02, 2.59]	4.49	< .001
log within	-0.03	9.37e-03	[-0.05, -0.01]	-2.94	0.003
log between	-0.02	0.08	[-0.18, 0.14]	-0.26	0.795
sex [M]	-0.07	0.21	[-0.49, 0.35]	-0.32	0.749
age	-0.02	6.66e-03	[-0.03, 0.00]	-2.50	0.012
ms	0.01	0.02	[-0.02, 0.05]	0.76	0.449

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_4.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4096 -0.5317 -0.1213 0.5438 9.0320

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.407 1.186
Residual 1.160 1.077
Number of obs: 4877, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.84232 0.44204 4.168
log_within -0.03886 0.01145 -3.395
log_between -0.03083 0.09123 -0.338
sexM -0.07923 0.21030 -0.377
age -0.01635 0.00653 -2.504
ms 0.01073 0.01878 0.571

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.011
log_between -0.776 -0.001
sexM -0.088 0.002 -0.021
age -0.518 -0.003 -0.028 -0.051
ms -0.271 -0.040 0.039 -0.041 0.075

Robustness weights for the residuals:
3756 weights are ~= 1. The remaining 1121 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.417 0.615 0.623 0.845 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.299 0.466 0.571 0.627 0.776 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4870)	p
(Intercept)	1.84	0.44	[0.98, 2.71]	4.17	< .001
log within	-0.04	0.01	[-0.06, -0.02]	-3.40	< .001
log between	-0.03	0.09	[-0.21, 0.15]	-0.34	0.735
sex [M]	-0.08	0.21	[-0.49, 0.33]	-0.38	0.706
age	-0.02	6.53e-03	[-0.03, 0.00]	-2.50	0.012
ms	0.01	0.02	[-0.03, 0.05]	0.57	0.568

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.4200 -0.5274 -0.1188 0.5439 9.0385

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.400 1.183
Residual 1.158 1.076
Number of obs: 4906, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.81568 0.42895 4.233
log_within -0.03589 0.01087 -3.302
log_between -0.02396 0.08776 -0.273
sexM -0.06845 0.20974 -0.326
age -0.01646 0.00651 -2.528
ms 0.01014 0.01841 0.551

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.013
log_between -0.762 -0.002
sexM -0.089 0.002 -0.024
age -0.557 -0.003 0.003 -0.052
ms -0.269 -0.049 0.032 -0.041 0.076

Robustness weights for the residuals:
3792 weights are ~= 1. The remaining 1114 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.416 0.609 0.619 0.834 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.294 0.460 0.570 0.626 0.799 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4899)	p
(Intercept)	1.82	0.43	[0.97, 2.66]	4.23	< .001
log within	-0.04	0.01	[-0.06, -0.01]	-3.30	< .001
log between	-0.02	0.09	[-0.20, 0.15]	-0.27	0.785
sex [M]	-0.07	0.21	[-0.48, 0.34]	-0.33	0.744
age	-0.02	6.51e-03	[-0.03, 0.00]	-2.53	0.012
ms	0.01	0.02	[-0.03, 0.05]	0.55	0.582

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_5.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.3538 -0.5364 -0.1207 0.5427 8.9665

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.424 1.193
Residual 1.184 1.088
Number of obs: 4761, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.968053 0.474187 4.150
log_within -0.031796 0.012980 -2.450
log_between -0.050086 0.097897 -0.512
sexM -0.079303 0.212055 -0.374
age -0.016437 0.006584 -2.496
ms 0.004075 0.020203 0.202

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between -0.802 0.000
sexM -0.099 0.000 0.003
age -0.477 0.000 -0.038 -0.051
ms -0.275 -0.006 0.048 -0.040 0.073

Robustness weights for the residuals:
3679 weights are ~= 1. The remaining 1082 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.150 0.413 0.609 0.620 0.836 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.306 0.471 0.576 0.617 0.772 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4754)	p
(Intercept)	1.97	0.47	[1.04, 2.90]	4.15	< .001
log within	-0.03	0.01	[-0.06, -0.01]	-2.45	0.014
log between	-0.05	0.10	[-0.24, 0.14]	-0.51	0.609
sex [M]	-0.08	0.21	[-0.50, 0.34]	-0.37	0.708
age	-0.02	6.58e-03	[-0.03, 0.00]	-2.50	0.013
ms	4.07e-03	0.02	[-0.04, 0.04]	0.20	0.840

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.09


```
=====
OUTCOME: sadness
EXPOSURE: LaW_5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.3744 -0.5298 -0.1193 0.5423 8.9763

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.410 1.188
Residual 1.175 1.084
Number of obs: 4823, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.901053 0.453958 4.188
log_within -0.036044 0.012296 -2.931
log_between -0.038832 0.093772 -0.414
sexM -0.072815 0.210673 -0.346
age -0.016502 0.006546 -2.521
ms 0.007030 0.019444 0.362

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.006
log_between -0.786 -0.001
sexM -0.087 0.001 -0.017
age -0.494 -0.001 -0.042 -0.051
ms -0.274 -0.022 0.042 -0.041 0.075

Robustness weights for the residuals:
3714 weights are ~= 1. The remaining 1109 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.150 0.419 0.614 0.624 0.848 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.300 0.467 0.583 0.636 0.820 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4816)	p
(Intercept)	1.90	0.45	[1.01, 2.79]	4.19	< .001
log within	-0.04	0.01	[-0.06, -0.01]	-2.93	0.003
log between	-0.04	0.09	[-0.22, 0.15]	-0.41	0.679
sex [M]	-0.07	0.21	[-0.49, 0.34]	-0.35	0.730
age	-0.02	6.55e-03	[-0.03, 0.00]	-2.52	0.012
ms	7.03e-03	0.02	[-0.03, 0.05]	0.36	0.718

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_6.5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-5.4516 -0.5286 -0.1275  0.5431  9.1496
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      1.38      1.175
Residual                   1.14      1.068
Number of obs: 4580, groups: id, 171
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)  2.114041   0.458282   4.613
log_within   -0.033334   0.014276  -2.335
log_between  -0.072320   0.091959  -0.786
sexM         -0.089646   0.209411  -0.428
age          -0.015779   0.006491  -2.431
ms           -0.017192   0.021596  -0.796
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.008
log_between -0.790  0.001
sexM        -0.127 -0.001  0.038
age         -0.479  0.002 -0.050 -0.054
ms          -0.289  0.027  0.046 -0.041  0.069
```

```
Robustness weights for the residuals:
3544 weights are ~= 1. The remaining 1036 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.147  0.406   0.593   0.611  0.816   0.999
```

```
Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.309  0.467   0.565   0.612  0.738   0.998
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4573)	p
(Intercept)	2.11	0.46	[1.22, 3.01]	4.61	< .001
log within	-0.03	0.01	[-0.06, -0.01]	-2.34	0.020
log between	-0.07	0.09	[-0.25, 0.11]	-0.79	0.432
sex [M]	-0.09	0.21	[-0.50, 0.32]	-0.43	0.669
age	-0.02	6.49e-03	[-0.03, 0.00]	-2.43	0.015
ms	-0.02	0.02	[-0.06, 0.03]	-0.80	0.426

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	1.07

```
=====
OUTCOME: sadness
EXPOSURE: LaW_6
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.3917 -0.5333 -0.1264 0.5449 9.0487

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.400 1.183
Residual 1.166 1.080
Number of obs: 4678, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.004342 0.458227 4.374
log_within -0.036336 0.013571 -2.678
log_between -0.050803 0.092229 -0.551
sexM -0.094820 0.210585 -0.450
age -0.016141 0.006533 -2.471
ms -0.007302 0.020899 -0.349

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.788 0.000
sexM -0.114 0.000 0.019
age -0.489 0.000 -0.042 -0.052
ms -0.288 0.002 0.049 -0.041 0.071

Robustness weights for the residuals:
3609 weights are ~= 1. The remaining 1069 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.149 0.414 0.608 0.619 0.841 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.305 0.469 0.579 0.621 0.763 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4671)	p
(Intercept)	2.00	0.46	[1.11, 2.90]	4.37	< .001
log within	-0.04	0.01	[-0.06, -0.01]	-2.68	0.007
log between	-0.05	0.09	[-0.23, 0.13]	-0.55	0.582
sex [M]	-0.09	0.21	[-0.51, 0.32]	-0.45	0.653
age	-0.02	6.53e-03	[-0.03, 0.00]	-2.47	0.014
ms	-7.30e-03	0.02	[-0.05, 0.03]	-0.35	0.727

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	1.08

```
=====
OUTCOME: sadness
EXPOSURE: LaW_7.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.6319 -0.5266 -0.1316 0.5373 9.4423

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.406 1.186
Residual 1.070 1.035
Number of obs: 4197, groups: id, 170

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.187668 0.475991 4.596
log_within -0.018401 0.015354 -1.198
log_between -0.083203 0.095136 -0.875
sexM -0.102675 0.212731 -0.483
age -0.015795 0.006563 -2.407
ms -0.025121 0.023923 -1.050

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.009
log_between -0.797 0.002
sexM -0.119 -0.001 0.032
age -0.471 0.002 -0.043 -0.055
ms -0.291 0.030 0.044 -0.042 0.061

Robustness weights for the residuals:
3235 weights are ~= 1. The remaining 962 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.142 0.395 0.585 0.607 0.825 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.317 0.473 0.571 0.611 0.733 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4190)	p
(Intercept)	2.19	0.48	[1.25, 3.12]	4.60	< .001
log within	-0.02	0.02	[-0.05, 0.01]	-1.20	0.231
log between	-0.08	0.10	[-0.27, 0.10]	-0.87	0.382
sex [M]	-0.10	0.21	[-0.52, 0.31]	-0.48	0.629
age	-0.02	6.56e-03	[-0.03, 0.00]	-2.41	0.016
ms	-0.03	0.02	[-0.07, 0.02]	-1.05	0.294

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	1.03

```
=====
OUTCOME: sadness
EXPOSURE: LaW_7
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5266 -0.5209 -0.1299 0.5455 9.2739

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.344 1.159
Residual 1.110 1.054
Number of obs: 4426, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.071452 0.459080 4.512
log_within -0.026284 0.014869 -1.768
log_between -0.056560 0.091552 -0.618
sexM -0.077802 0.207693 -0.375
age -0.015683 0.006418 -2.444
ms -0.024821 0.022512 -1.103

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.007
log_between -0.793 0.001
sexM -0.125 -0.001 0.038
age -0.476 0.002 -0.046 -0.055
ms -0.290 0.024 0.043 -0.041 0.064

Robustness weights for the residuals:
3429 weights are ~= 1. The remaining 997 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.145 0.398 0.588 0.606 0.814 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.305 0.455 0.536 0.593 0.737 0.980

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4419)	p
(Intercept)	2.07	0.46	[1.17, 2.97]	4.51	< .001
log within	-0.03	0.01	[-0.06, 0.00]	-1.77	0.077
log between	-0.06	0.09	[-0.24, 0.12]	-0.62	0.537
sex [M]	-0.08	0.21	[-0.48, 0.33]	-0.37	0.708
age	-0.02	6.42e-03	[-0.03, 0.00]	-2.44	0.015
ms	-0.02	0.02	[-0.07, 0.02]	-1.10	0.270

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.16
SD (Residual)	1.05

```
=====
OUTCOME: sadness
EXPOSURE: LaW_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.6329 -0.5231 -0.1302 0.5368 9.4615

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.429 1.196
Residual 1.064 1.031
Number of obs: 3836, groups: id, 166

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.185666 0.476501 4.587
log_within -0.027770 0.016495 -1.684
log_between -0.082474 0.094646 -0.871
sexM -0.168170 0.217901 -0.772
age -0.015077 0.006655 -2.265
ms -0.026952 0.026595 -1.013

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.014
log_between -0.786 0.002
sexM -0.127 -0.002 0.047
age -0.475 0.003 -0.048 -0.066
ms -0.306 0.043 0.041 -0.036 0.057

Robustness weights for the residuals:
2982 weights are ~= 1. The remaining 854 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.142 0.389 0.575 0.600 0.821 0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.324 0.457 0.605 0.621 0.759 0.991

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3829)	p
(Intercept)	2.19	0.48	[1.25, 3.12]	4.59	< .001
log within	-0.03	0.02	[-0.06, 0.00]	-1.68	0.092
log between	-0.08	0.09	[-0.27, 0.10]	-0.87	0.384
sex [M]	-0.17	0.22	[-0.60, 0.26]	-0.77	0.440
age	-0.02	6.66e-03	[-0.03, 0.00]	-2.27	0.024
ms	-0.03	0.03	[-0.08, 0.03]	-1.01	0.311

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.20
SD (Residual)	1.03

```
=====
OUTCOME: sadness
EXPOSURE: LaW_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.8311 -0.5365 -0.1317 0.5481 9.5279

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.390 1.179
Residual 1.053 1.026
Number of obs: 4069, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.374211 0.469012 5.062
log_within -0.044576 0.016986 -2.624
log_between -0.131878 0.094949 -1.389
sexM -0.157856 0.212926 -0.741
age -0.013548 0.006466 -2.095
ms -0.042165 0.024523 -1.719

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.006
log_between -0.795 0.000
sexM -0.104 0.001 0.009
age -0.501 -0.001 -0.015 -0.052
ms -0.268 -0.022 0.030 -0.042 0.062

Robustness weights for the residuals:
3156 weights are ~= 1. The remaining 913 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.141 0.391 0.588 0.605 0.815 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.314 0.450 0.628 0.616 0.736 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4062)	p
(Intercept)	2.37	0.47	[1.45, 3.29]	5.06	< .001
log within	-0.04	0.02	[-0.08, -0.01]	-2.62	0.009
log between	-0.13	0.09	[-0.32, 0.05]	-1.39	0.165
sex [M]	-0.16	0.21	[-0.58, 0.26]	-0.74	0.459
age	-0.01	6.47e-03	[-0.03, 0.00]	-2.10	0.036
ms	-0.04	0.02	[-0.09, 0.01]	-1.72	0.086

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.18
SD (Residual)	1.03

```
=====
OUTCOME: sleepiness
EXPOSURE: DAY_10_11
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.0365 -0.6115 -0.0800 0.6100 7.0052

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.749 1.322
Residual 1.601 1.265
Number of obs: 5660, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.370179 0.342831 18.581
log_within -0.025446 0.008551 -2.976
log_between -0.189381 0.053785 -3.521
sexM -0.217555 0.233536 -0.932
age -0.031192 0.007448 -4.188
wakeupTime_dec -0.219414 0.016027 -13.690

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.194
log_between -0.327 0.059
sexM -0.178 -0.004 0.070
age -0.651 0.012 -0.286 -0.063
wakeupTm_dc -0.497 0.391 0.151 -0.011 0.030

Robustness weights for the residuals:
4492 weights are ~= 1. The remaining 1168 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.192 0.557 0.747 0.715 0.903 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.529 0.747 0.864 0.825 0.925 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	6.37	0.34	[5.70, 7.04]	18.58	< .001
log within	-0.03	8.55e-03	[-0.04, -0.01]	-2.98	0.003
log between	-0.19	0.05	[-0.29, -0.08]	-3.52	< .001
sex [M]	-0.22	0.23	[-0.68, 0.24]	-0.93	0.352
age	-0.03	7.45e-03	[-0.05, -0.02]	-4.19	< .001
wakeupTime dec	-0.22	0.02	[-0.25, -0.19]	-13.69	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.27


```
=====
OUTCOME: sleepiness
EXPOSURE: DAY_11_12
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-4.0067 -0.6165 -0.0784  0.6168  6.9710
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.719    1.311
Residual                1.608    1.268
Number of obs: 5660, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.661039   0.375626  17.733
log_within     -0.042337   0.009501  -4.456
log_between    -0.207146   0.063009  -3.288
sexM           -0.180182   0.231222  -0.779
age            -0.033549   0.007284  -4.606
wakeupTime_dec -0.219895   0.015479 -14.206
```

```
Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.144
log_between -0.525  0.041
sexM        -0.159 -0.005  0.035
age         -0.558  0.013 -0.236 -0.052
wakeupTm_dc -0.467  0.307  0.134 -0.017  0.041
```

```
Robustness weights for the residuals:
4488 weights are ~= 1. The remaining 1172 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.193  0.559   0.747   0.718  0.904   0.999
```

```
Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.495  0.720   0.850   0.817  0.931   0.998
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5653)	p
(Intercept)	6.66	0.38	[5.92, 7.40]	17.73	< .001
log within	-0.04	9.50e-03	[-0.06, -0.02]	-4.46	< .001
log between	-0.21	0.06	[-0.33, -0.08]	-3.29	0.001
sex [M]	-0.18	0.23	[-0.63, 0.27]	-0.78	0.436
age	-0.03	7.28e-03	[-0.05, -0.02]	-4.61	< .001
wakeupTime dec	-0.22	0.02	[-0.25, -0.19]	-14.21	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.31
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: DAY_12_13
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.0059 -0.6178 -0.0754 0.6141 6.9716

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.718 1.311
Residual 1.607 1.268
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.841958 0.430583 15.890
log_within -0.049197 0.010588 -4.646
log_between -0.246521 0.077407 -3.185
sexM -0.171951 0.231282 -0.743
age -0.034632 0.007195 -4.813
wakeupTime_dec -0.210314 0.015071 -13.954

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.088
log_between -0.675 0.025
sexM -0.154 -0.003 0.045
age -0.477 0.010 -0.183 -0.052
wakeupTm_dc -0.418 0.211 0.119 -0.015 0.050

Robustness weights for the residuals:
4494 weights are ~= 1. The remaining 1167 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.193 0.559 0.751 0.717 0.904 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.485 0.680 0.853 0.831 0.969 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	6.84	0.43	[6.00, 7.69]	15.89	< .001
log within	-0.05	0.01	[-0.07, -0.03]	-4.65	< .001
log between	-0.25	0.08	[-0.40, -0.09]	-3.18	0.001
sex [M]	-0.17	0.23	[-0.63, 0.28]	-0.74	0.457
age	-0.03	7.20e-03	[-0.05, -0.02]	-4.81	< .001
wakeupTime dec	-0.21	0.02	[-0.24, -0.18]	-13.95	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.31
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: DAY_13_14
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-4.0228 -0.6255 -0.0704  0.6069  7.0577
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.63      1.277
Residual                1.61      1.269
Number of obs: 5659, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    7.198040   0.484612  14.853
log_within     -0.054290   0.010477  -5.182
log_between    -0.326976   0.092411  -3.538
sexM            -0.171868   0.225632  -0.762
age            -0.035170   0.006975  -5.043
wakeupTime_dec -0.206161   0.014844 -13.888
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.053
log_between -0.767  0.013
sexM        -0.150 -0.002  0.057
age         -0.410  0.009 -0.148 -0.053
wakeupTm_dc -0.367  0.145  0.090 -0.016  0.060
```

```
Robustness weights for the residuals:
4489 weights are ~= 1. The remaining 1170 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.558   0.757   0.718  0.905   0.999
```

```
Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.480  0.680   0.831   0.801  0.953   0.996
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	7.20	0.48	[6.25, 8.15]	14.85	< .001
log within	-0.05	0.01	[-0.07, -0.03]	-5.18	< .001
log between	-0.33	0.09	[-0.51, -0.15]	-3.54	< .001
sex [M]	-0.17	0.23	[-0.61, 0.27]	-0.76	0.446
age	-0.04	6.97e-03	[-0.05, -0.02]	-5.04	< .001
wakeupTime dec	-0.21	0.01	[-0.24, -0.18]	-13.89	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.28
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: DAY_14_15
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.0039 -0.6182 -0.0740 0.6157 7.0052

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.727 1.314
Residual 1.603 1.266
Number of obs: 5659, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.869876 0.514295 13.358
log_within -0.051136 0.009575 -5.340
log_between -0.246931 0.097869 -2.523
sexM -0.175321 0.232361 -0.755
age -0.037492 0.007106 -5.276
wakeupTime_dec -0.199469 0.014721 -13.550

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.028
log_between -0.787 0.004
sexM -0.166 -0.001 0.079
age -0.459 0.006 -0.066 -0.050
wakeupTm_dc -0.319 0.088 0.050 -0.016 0.068

Robustness weights for the residuals:
4498 weights are ~= 1. The remaining 1161 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.192 0.560 0.749 0.715 0.899 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.510 0.731 0.847 0.820 0.959 0.991

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5652)	p
(Intercept)	6.87	0.51	[5.86, 7.88]	13.36	< .001
log within	-0.05	9.58e-03	[-0.07, -0.03]	-5.34	< .001
log between	-0.25	0.10	[-0.44, -0.06]	-2.52	0.012
sex [M]	-0.18	0.23	[-0.63, 0.28]	-0.75	0.451
age	-0.04	7.11e-03	[-0.05, -0.02]	-5.28	< .001
wakeupTime dec	-0.20	0.01	[-0.23, -0.17]	-13.55	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.31
SD (Residual)	1.27

```

=====
OUTCOME: sleepiness
EXPOSURE: DAY_15_16
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.1002 -0.6143 -0.0684  0.6018  7.0238

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.727     1.314
Residual                   1.593     1.262
Number of obs: 5659, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.873092   0.500695  13.727
log_within     -0.064707   0.009413  -6.874
log_between    -0.238606   0.092344  -2.584
sexM            -0.146447   0.231678  -0.632
age            -0.039137   0.007090  -5.520
wakeupTime_dec -0.201467   0.014654 -13.748

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.022
log_between -0.774  0.004
sexM        -0.133 -0.001  0.034
age         -0.539  0.005  0.017 -0.044
wakeupTm_dc -0.328  0.069  0.055 -0.018  0.073

Robustness weights for the residuals:
4486 weights are ~= 1. The remaining 1173 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.562   0.754   0.719  0.904   0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.495  0.670   0.826   0.799  0.944   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5652) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.87 | 0.50 | [ 5.89, 7.85] | 13.73 | < .001
log within | -0.06 | 9.41e-03 | [-0.08, -0.05] | -6.87 | < .001
log between | -0.24 | 0.09 | [-0.42, -0.06] | -2.58 | 0.010
sex [M] | -0.15 | 0.23 | [-0.60, 0.31] | -0.63 | 0.527
age | -0.04 | 7.09e-03 | [-0.05, -0.03] | -5.52 | < .001
wakeupTime dec | -0.20 | 0.01 | [-0.23, -0.17] | -13.75 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.31
SD (Residual) | 1.26

```

```
=====
OUTCOME: sleepiness
EXPOSURE: DAY_16_17
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9683 -0.6066 -0.0658 0.6096 7.0071

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.762 1.328
Residual 1.599 1.265
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.673076 0.480105 13.899
log_within -0.077132 0.009597 -8.037
log_between -0.213996 0.098114 -2.181
sexM -0.098963 0.234248 -0.422
age -0.038904 0.007159 -5.434
wakeupTime_dec -0.202672 0.014645 -13.839

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.023
log_between -0.747 0.003
sexM -0.067 -0.002 -0.061
age -0.555 0.005 0.002 -0.044
wakeupTm_dc -0.332 0.070 0.046 -0.023 0.071

Robustness weights for the residuals:
4485 weights are ~= 1. The remaining 1176 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.192 0.562 0.750 0.718 0.905 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.485 0.721 0.851 0.813 0.922 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	6.67	0.48	[5.73, 7.61]	13.90	< .001
log within	-0.08	9.60e-03	[-0.10, -0.06]	-8.04	< .001
log between	-0.21	0.10	[-0.41, -0.02]	-2.18	0.029
sex [M]	-0.10	0.23	[-0.56, 0.36]	-0.42	0.673
age	-0.04	7.16e-03	[-0.05, -0.02]	-5.43	< .001
wakeupTime dec	-0.20	0.01	[-0.23, -0.17]	-13.84	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.26

```

=====
OUTCOME: sleepiness
EXPOSURE: DAY_17_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.0509 -0.6088 -0.0669  0.6012  7.0838

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.772     1.331
Residual                   1.586     1.259
Number of obs: 5655, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.585825   0.461158  14.281
log_within     -0.077057   0.010201  -7.554
log_between    -0.234529   0.114419  -2.050
sexM            -0.069949   0.236182  -0.296
age            -0.039859   0.007182  -5.549
wakeupTime_dec -0.202051   0.014602 -13.837

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.018
log_between -0.720  0.002
sexM        -0.028 -0.001 -0.123
age         -0.608  0.004  0.043 -0.049
wakeupTm_dc -0.331  0.056  0.029 -0.023  0.072

Robustness weights for the residuals:
4476 weights are ~= 1. The remaining 1179 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.190  0.561  0.752  0.719  0.907  0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.476  0.713  0.862  0.825  0.962  0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5648) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.59 | 0.46 | [ 5.68, 7.49] | 14.28 | < .001
log within | -0.08 | 0.01 | [-0.10, -0.06] | -7.55 | < .001
log between | -0.23 | 0.11 | [-0.46, -0.01] | -2.05 | 0.040
sex [M] | -0.07 | 0.24 | [-0.53, 0.39] | -0.30 | 0.767
age | -0.04 | 7.18e-03 | [-0.05, -0.03] | -5.55 | < .001
wakeupTime dec | -0.20 | 0.01 | [-0.23, -0.17] | -13.84 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.33
SD (Residual) | 1.26

```

```

=====
OUTCOME: sleepiness
EXPOSURE: DAY_8_9
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.9645 -0.6146 -0.0687  0.6195  7.0036

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.797     1.341
Residual                1.603     1.266
Number of obs: 5662, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.857488   0.327979  17.859
log_within     -0.010262   0.007984  -1.285
log_between    -0.179969   0.051052  -3.525
sexM            -0.257959   0.237536  -1.086
age            -0.032705   0.007367  -4.439
wakeupTime_dec -0.212208   0.016142 -13.146

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.189
log_between 0.009 0.060
sexM        -0.163 -0.002 0.111
age         -0.809 0.018 -0.191 -0.065
wakeupTm_dc -0.471 0.402 0.150 -0.005 0.046

Robustness weights for the residuals:
4492 weights are ~= 1. The remaining 1170 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.192  0.558   0.750   0.717  0.904   0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 36 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.565  0.802   0.939   0.871  0.976   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5655) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.86 | 0.33 | [ 5.21, 6.50] | 17.86 | < .001
log within | -0.01 | 7.98e-03 | [-0.03, 0.01] | -1.29 | 0.199
log between | -0.18 | 0.05 | [-0.28, -0.08] | -3.53 | < .001
sex [M] | -0.26 | 0.24 | [-0.72, 0.21] | -1.09 | 0.278
age | -0.03 | 7.37e-03 | [-0.05, -0.02] | -4.44 | < .001
wakeupTime dec | -0.21 | 0.02 | [-0.24, -0.18] | -13.15 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 1.27

```



```

=====
OUTCOME: sleepiness
EXPOSURE: DAY_9_10
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.9770 -0.6136 -0.0730  0.6170  6.9747

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.773     1.332
Residual                   1.606     1.267
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.002694   0.332519  18.052
log_within    -0.007412   0.008151  -0.909
log_between   -0.177047   0.049320  -3.590
sexM           -0.232937   0.235222  -0.990
age            -0.031047   0.007406  -4.192
wakeupTime_dec -0.206393   0.016527 -12.488

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.222
log_between -0.163  0.071
sexM        -0.173 -0.004  0.075
age         -0.744  0.016 -0.243 -0.062
wakeupTm_dc -0.502  0.443  0.160 -0.009  0.037

Robustness weights for the residuals:
4496 weights are ~= 1. The remaining 1165 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.193  0.557   0.749   0.715  0.902   0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 35 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.572  0.807   0.915   0.866  0.970   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.00 | 0.33 | [ 5.35, 6.65] | 18.05 | < .001
log within | -7.41e-03 | 8.15e-03 | [-0.02, 0.01] | -0.91 | 0.363
log between | -0.18 | 0.05 | [-0.27, -0.08] | -3.59 | < .001
sex [M] | -0.23 | 0.24 | [-0.69, 0.23] | -0.99 | 0.322
age | -0.03 | 7.41e-03 | [-0.05, -0.02] | -4.19 | < .001
wakeupTime dec | -0.21 | 0.02 | [-0.24, -0.17] | -12.49 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.33
SD (Residual) | 1.27

```

```
=====
OUTCOME: sleepiness
EXPOSURE: DAY_sunrise_8
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.0128 -0.6167 -0.0704 0.6170 7.0104

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.830 1.353
Residual 1.598 1.264
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.533399 0.345351 16.023
log_within 0.012583 0.010523 1.196
log_between -0.146512 0.070014 -2.093
sexM -0.215981 0.239721 -0.901
age -0.037480 0.007315 -5.124
wakeupTime_dec -0.191795 0.015277 -12.554

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.105
log_between 0.325 0.029
sexM -0.120 -0.002 0.116
age -0.808 0.017 -0.081 -0.053
wakeupTm_dc -0.394 0.268 0.108 -0.009 0.063

Robustness weights for the residuals:
4493 weights are ~= 1. The remaining 1168 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.192 0.555 0.749 0.714 0.903 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.492 0.727 0.858 0.840 0.969 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	5.53	0.35	[4.86, 6.21]	16.02	< .001
log within	0.01	0.01	[-0.01, 0.03]	1.20	0.232
log between	-0.15	0.07	[-0.28, -0.01]	-2.09	0.036
sex [M]	-0.22	0.24	[-0.69, 0.25]	-0.90	0.368
age	-0.04	7.31e-03	[-0.05, -0.02]	-5.12	< .001
wakeupTime dec	-0.19	0.02	[-0.22, -0.16]	-12.55	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	1.26

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_0.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.4235 -0.6024 -0.0788  0.6117  7.8712

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.183     1.478
Residual                1.276     1.129
Number of obs: 2255, groups: id, 139

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.733379   0.435018  10.881
log_within     -0.006236   0.011120  -0.561
log_between     0.035159   0.082456   0.426
sexM            -0.117844   0.307525  -0.383
age            -0.035515   0.009215  -3.854
ms             -0.199046   0.043005  -4.628

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.025
log_between 0.372 -0.001
sexM        -0.170 -0.003 -0.127
age         -0.835  0.004 -0.203 -0.044
ms_dia_sgnt -0.401  0.060 -0.040 -0.025  0.048

Robustness weights for the residuals:
1784 weights are ~= 1. The remaining 471 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.171  0.551  0.772  0.721  0.911  0.999

Robustness weights for the random effects:
113 weights are ~= 1. The remaining 26 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.516  0.802  0.907  0.849  0.936  0.995

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2248) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.73 | 0.44 | [ 3.88, 5.59] | 10.88 | < .001
log within | -6.24e-03 | 0.01 | [-0.03, 0.02] | -0.56 | 0.575
log between | 0.04 | 0.08 | [-0.13, 0.20] | 0.43 | 0.670
sex [M] | -0.12 | 0.31 | [-0.72, 0.49] | -0.38 | 0.702
age | -0.04 | 9.21e-03 | [-0.05, -0.02] | -3.85 | < .001
ms | -0.20 | 0.04 | [-0.28, -0.11] | -4.63 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.48
SD (Residual) | 1.13

```

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_1.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.4657 -0.5956 -0.0889  0.6186  7.7186

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.046     1.431
Residual                   1.324     1.151
Number of obs: 3382, groups: id, 151

Fixed effects:
              Estimate Std. Error t value
(Intercept)   4.866037   0.363390  13.391
log_within    -0.003278   0.010206  -0.321
log_between    0.101047   0.089491   1.129
sexM           -0.271444   0.276433  -0.982
age            -0.037722   0.008348  -4.519
ms             -0.197076   0.031288  -6.299

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.017
log_between 0.078 -0.003
sexM        -0.154  0.000 -0.131
age         -0.850  0.003 -0.083 -0.058
ms_dia_sgnt -0.399  0.046 -0.026 -0.022  0.065

Robustness weights for the residuals:
2679 weights are ~= 1. The remaining 703 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.174  0.561  0.767  0.725  0.918  0.999

Robustness weights for the random effects:
120 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.486  0.754  0.920  0.851  0.971  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3375) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.87 | 0.36 | [ 4.15, 5.58] | 13.39 | < .001
log within | -3.28e-03 | 0.01 | [-0.02, 0.02] | -0.32 | 0.748
log between | 0.10 | 0.09 | [-0.07, 0.28] | 1.13 | 0.259
sex [M] | -0.27 | 0.28 | [-0.81, 0.27] | -0.98 | 0.326
age | -0.04 | 8.35e-03 | [-0.05, -0.02] | -4.52 | < .001
ms | -0.20 | 0.03 | [-0.26, -0.14] | -6.30 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.43
SD (Residual) | 1.15

```

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.6936 -0.5912 -0.0901  0.6072  7.9428

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.168     1.473
Residual                   1.252     1.119
Number of obs: 2829, groups: id, 145

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.975069   0.394055  12.625
log_within     -0.010789   0.010185  -1.059
log_between     0.162397   0.087544   1.855
sexM            -0.176307   0.291250  -0.605
age            -0.039013   0.008798  -4.434
ms             -0.213209   0.036029  -5.918

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.017
log_between   0.239 -0.002
sexM          -0.162  0.000 -0.098
age          -0.846  0.002 -0.152 -0.056
ms_dia_sgnt -0.392  0.044 -0.030 -0.023  0.050

Robustness weights for the residuals:
2229 weights are ~= 1. The remaining 600 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.169  0.560  0.782  0.728  0.914  0.999

Robustness weights for the random effects:
121 weights are ~= 1. The remaining 24 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.508  0.721  0.910  0.846  0.970  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(2822) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.98 | 0.39 | [ 4.20, 5.75] | 12.63 | < .001
log within | -0.01 | 0.01 | [-0.03, 0.01] | -1.06 | 0.290
log between | 0.16 | 0.09 | [-0.01, 0.33] | 1.86 | 0.064
sex [M] | -0.18 | 0.29 | [-0.75, 0.39] | -0.61 | 0.545
age | -0.04 | 8.80e-03 | [-0.06, -0.02] | -4.43 | < .001
ms | -0.21 | 0.04 | [-0.28, -0.14] | -5.92 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.47
SD (Residual) | 1.12

```

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_2.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.2943 -0.6083 -0.0875  0.6107  7.5641

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.939     1.392
Residual                   1.379     1.174
Number of obs: 4093, groups: id, 160

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.626333   0.347690  13.306
log_within     -0.001592   0.010756  -0.148
log_between     0.192727   0.093489   2.061
sexM            -0.308989   0.259052  -1.193
age            -0.038184   0.007981  -4.784
ms             -0.149694   0.026659  -5.615

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.017
log_between -0.153 -0.003
sexM        -0.138  0.000 -0.106
age         -0.845  0.003 -0.001 -0.057
ms_dia_sgnt -0.385  0.047 -0.017 -0.023  0.073

Robustness weights for the residuals:
3232 weights are ~= 1. The remaining 861 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.178  0.570   0.764   0.726  0.915   0.999

Robustness weights for the random effects:
130 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.479  0.732   0.918   0.849  0.959   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4086) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.63 | 0.35 | [ 3.94, 5.31] | 13.31 | < .001
log within | -1.59e-03 | 0.01 | [-0.02, 0.02] | -0.15 | 0.882
log between | 0.19 | 0.09 | [ 0.01, 0.38] | 2.06 | 0.039
sex [M] | -0.31 | 0.26 | [-0.82, 0.20] | -1.19 | 0.233
age | -0.04 | 7.98e-03 | [-0.05, -0.02] | -4.78 | < .001
ms | -0.15 | 0.03 | [-0.20, -0.10] | -5.62 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.39
SD (Residual) | 1.17

```

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.8116 -0.5999 -0.0892  0.6107  7.6875

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.010     1.418
Residual                1.335     1.155
Number of obs: 3762, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.748420   0.354135  13.409
log_within      0.002368   0.010411   0.227
log_between     0.156603   0.088512   1.769
sexM            -0.329365   0.270517  -1.218
age             -0.037378   0.008192  -4.563
ms             -0.179290   0.028717  -6.243

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.024
log_between -0.057 -0.004
sexM        -0.136 -0.001 -0.107
age         -0.850  0.004 -0.024 -0.068
ms_dia_sgnt -0.388  0.067 -0.032 -0.016  0.065

Robustness weights for the residuals:
2973 weights are ~= 1. The remaining 789 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.175  0.568  0.766  0.728  0.913  0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.481  0.801  0.944  0.865  0.973  0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3755) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.75 | 0.35 | [ 4.05, 5.44] | 13.41 | < .001
log within | 2.37e-03 | 0.01 | [-0.02, 0.02] | 0.23 | 0.820
log between | 0.16 | 0.09 | [-0.02, 0.33] | 1.77 | 0.077
sex [M] | -0.33 | 0.27 | [-0.86, 0.20] | -1.22 | 0.223
age | -0.04 | 8.19e-03 | [-0.05, -0.02] | -4.56 | < .001
ms | -0.18 | 0.03 | [-0.24, -0.12] | -6.24 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.42
SD (Residual) | 1.16

```

```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_20_21
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-4.0218 -0.5999 -0.0831  0.5973  7.0710
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept) 1.773      1.331
Residual                1.564      1.251
Number of obs: 5092, groups: id, 168
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   4.038070   0.391182  10.323
log_within     0.003070   0.012103   0.254
log_between    0.070793   0.116088   0.610
sexM           -0.204863   0.239174  -0.857
age            -0.032561   0.007315  -4.451
wakeupTime_dec -0.029176   0.015425  -1.891
```

```
Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.004
log_between -0.553  0.000
sexM        -0.071 -0.002 -0.109
age         -0.753 -0.002  0.125 -0.068
wakeupTm_dc -0.385  0.017 -0.002 -0.024  0.074
```

```
Robustness weights for the residuals:
4022 weights are ~= 1. The remaining 1070 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.190  0.558   0.744   0.720  0.915   0.999
```

```
Robustness weights for the random effects:
135 weights are ~= 1. The remaining 33 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.497  0.751   0.922   0.861  0.969   0.999
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5085)	p
(Intercept)	4.04	0.39	[3.27, 4.80]	10.32	< .001
log within	3.07e-03	0.01	[-0.02, 0.03]	0.25	0.800
log between	0.07	0.12	[-0.16, 0.30]	0.61	0.542
sex [M]	-0.20	0.24	[-0.67, 0.26]	-0.86	0.392
age	-0.03	7.31e-03	[-0.05, -0.02]	-4.45	< .001
wakeupTime dec	-0.03	0.02	[-0.06, 0.00]	-1.89	0.059

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.25


```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_21_22
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.0179 -0.6022 -0.0810 0.5969 7.0707

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.785 1.336
Residual 1.560 1.249
Number of obs: 5106, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.003378 0.362437 11.046
log_within 0.012772 0.011523 1.108
log_between 0.125584 0.100717 1.247
sexM -0.247441 0.241423 -1.025
age -0.032142 0.007332 -4.384
wakeupTime_dec -0.032006 0.015474 -2.068

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.431 -0.005
sexM -0.074 -0.002 -0.156
age -0.792 -0.001 0.120 -0.073
wakeupTm_dc -0.405 0.012 -0.030 -0.019 0.071

Robustness weights for the residuals:
4032 weights are ~= 1. The remaining 1074 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.190 0.557 0.747 0.721 0.919 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.494 0.743 0.915 0.851 0.955 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5099)	p
(Intercept)	4.00	0.36	[3.29, 4.71]	11.05	< .001
log within	0.01	0.01	[-0.01, 0.04]	1.11	0.268
log between	0.13	0.10	[-0.07, 0.32]	1.25	0.212
sex [M]	-0.25	0.24	[-0.72, 0.23]	-1.02	0.305
age	-0.03	7.33e-03	[-0.05, -0.02]	-4.38	< .001
wakeupTime dec	-0.03	0.02	[-0.06, 0.00]	-2.07	0.039

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	1.25

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_22_23
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.0434 -0.6029 -0.0795  0.5964  7.1039

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.788     1.337
Residual                   1.556     1.247
Number of obs: 5101, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.076014   0.332548  12.257
log_within      0.013682   0.009808   1.395
log_between     0.095464   0.078352   1.218
sexM            -0.264040   0.243912  -1.083
age             -0.031700   0.007340  -4.319
wakeupTime_dec -0.028948   0.015477  -1.870

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.002
log_between -0.181 -0.001
sexM        -0.115  0.002 -0.207
age         -0.829 -0.001  0.122 -0.079
wakeupTm_dc -0.440  0.005 -0.074 -0.008  0.065

Robustness weights for the residuals:
4025 weights are ~= 1. The remaining 1076 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.189  0.562  0.744  0.722  0.918  0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.506  0.764  0.924  0.859  0.960  0.994

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5094) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.08 | 0.33 | [ 3.42, 4.73] | 12.26 | < .001
log within | 0.01 | 9.81e-03 | [-0.01, 0.03] | 1.39 | 0.163
log between | 0.10 | 0.08 | [-0.06, 0.25] | 1.22 | 0.223
sex [M] | -0.26 | 0.24 | [-0.74, 0.21] | -1.08 | 0.279
age | -0.03 | 7.34e-03 | [-0.05, -0.02] | -4.32 | < .001
wakeupTime dec | -0.03 | 0.02 | [-0.06, 0.00] | -1.87 | 0.061

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 1.25

```

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_23_0
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.0495 -0.5997 -0.0798  0.5938  7.0711

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.787     1.337
Residual                   1.566     1.251
Number of obs: 5096, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.155681   0.328606  12.646
log_within      0.018509   0.009114   2.031
log_between     0.048635   0.066713   0.729
sexM            -0.246480   0.246723  -0.999
age            -0.032040   0.007328  -4.372
wakeupTime_dec -0.027301   0.015588  -1.751

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.019
log_between    0.091  0.003
sexM          -0.176  0.000 -0.254
age           -0.809 -0.004  0.108 -0.080
wakeupTm_dc -0.468 -0.036 -0.111  0.005  0.062

Robustness weights for the residuals:
4027 weights are ~= 1. The remaining 1069 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.190  0.560  0.744  0.721  0.912  0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.508  0.762  0.930  0.856  0.953  0.994

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5089) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.16 | 0.33 | [ 3.51, 4.80] | 12.65 | < .001
log within | 0.02 | 9.11e-03 | [ 0.00, 0.04] | 2.03 | 0.042
log between | 0.05 | 0.07 | [-0.08, 0.18] | 0.73 | 0.466
sex [M] | -0.25 | 0.25 | [-0.73, 0.24] | -1.00 | 0.318
age | -0.03 | 7.33e-03 | [-0.05, -0.02] | -4.37 | < .001
wakeupTime dec | -0.03 | 0.02 | [-0.06, 0.00] | -1.75 | 0.080

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 1.25

```

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3986 -0.6026 -0.0831  0.6008  7.4597

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.976     1.406
Residual                   1.419     1.191
Number of obs: 4262, groups: id, 164

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.501257   0.348806  12.905
log_within     -0.008499   0.011583  -0.734
log_between     0.167347   0.095820   1.746
sexM            -0.326810   0.258805  -1.263
age             -0.035625   0.007908  -4.505
ms              -0.135846   0.025508  -5.326

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.026
log_between  -0.221 -0.004
sexM          -0.119  0.000 -0.097
age           -0.835  0.005  0.006 -0.074
ms_dia_sgnt  -0.377  0.071 -0.026 -0.024  0.076

Robustness weights for the residuals:
3369 weights are ~= 1. The remaining 893 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.180  0.556   0.757   0.721  0.912   0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.496  0.796   0.927   0.869  0.973   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4255) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.50 | 0.35 | [ 3.82, 5.19] | 12.90 | < .001
log within | -8.50e-03 | 0.01 | [-0.03, 0.01] | -0.73 | 0.463
log between | 0.17 | 0.10 | [-0.02, 0.36] | 1.75 | 0.081
sex [M] | -0.33 | 0.26 | [-0.83, 0.18] | -1.26 | 0.207
age | -0.04 | 7.91e-03 | [-0.05, -0.02] | -4.50 | < .001
ms | -0.14 | 0.03 | [-0.19, -0.09] | -5.33 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.41
SD (Residual) | 1.19

```

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.1504 -0.6047 -0.0812  0.5995  7.1830

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.861     1.364
Residual                   1.521     1.233
Number of obs: 4809, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.172866   0.381543  10.937
log_within      0.004533   0.017014   0.266
log_between     0.110132   0.117629   0.936
sexM            -0.196941   0.246344  -0.799
age             -0.033976   0.007609  -4.465
ms             -0.080565   0.020354  -3.958

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.003
log_between   -0.542 -0.002
sexM          -0.098  0.001 -0.053
age           -0.779 -0.001  0.107 -0.076
ms_dia_sgnt  -0.294  0.000 -0.023 -0.039  0.083

Robustness weights for the residuals:
3804 weights are ~= 1. The remaining 1005 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.187  0.557   0.747   0.720  0.912   0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.507  0.728   0.918   0.850  0.967   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4802) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.17 | 0.38 | [ 3.42, 4.92] | 10.94 | < .001
log within | 4.53e-03 | 0.02 | [-0.03, 0.04] | 0.27 | 0.790
log between | 0.11 | 0.12 | [-0.12, 0.34] | 0.94 | 0.349
sex [M] | -0.20 | 0.25 | [-0.68, 0.29] | -0.80 | 0.424
age | -0.03 | 7.61e-03 | [-0.05, -0.02] | -4.47 | < .001
ms | -0.08 | 0.02 | [-0.12, -0.04] | -3.96 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.36
SD (Residual) | 1.23

```

```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_sunset_20
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.0180 -0.5999 -0.0812 0.5978 7.0670

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.785 1.336
Residual 1.566 1.252
Number of obs: 5099, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.205744 0.410182 10.253
log_within -0.005446 0.013439 -0.405
log_between -0.006094 0.128783 -0.047
sexM -0.193398 0.238573 -0.811
age -0.033132 0.007310 -4.532
wakeupTime_dec -0.031271 0.015499 -2.018

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.013
log_between -0.603 0.000
sexM -0.132 -0.001 0.010
age -0.710 0.002 0.089 -0.054
wakeupTm_dc -0.377 0.037 0.012 -0.024 0.075

Robustness weights for the residuals:
4028 weights are ~= 1. The remaining 1071 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.190 0.558 0.744 0.721 0.915 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.501 0.783 0.919 0.861 0.962 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5092)	p
(Intercept)	4.21	0.41	[3.40, 5.01]	10.25	< .001
log within	-5.45e-03	0.01	[-0.03, 0.02]	-0.41	0.685
log between	-6.09e-03	0.13	[-0.26, 0.25]	-0.05	0.962
sex [M]	-0.19	0.24	[-0.66, 0.27]	-0.81	0.418
age	-0.03	7.31e-03	[-0.05, -0.02]	-4.53	< .001
wakeupTime dec	-0.03	0.02	[-0.06, 0.00]	-2.02	0.044

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	1.25

```

=====
OUTCOME: sleepiness
EXPOSURE: LAN_0_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.0225 -0.6098 -0.0694  0.6193  7.0403

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 1.842    1.357
 Residual                1.586    1.259
Number of obs: 5657, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.137375   0.344371  17.822
log_within      0.048752   0.009338   5.221
log_between     0.112233   0.071726   1.565
sexM            -0.261007   0.242355  -1.077
age             -0.038447   0.007355  -5.227
wakeupTime_dec -0.209102   0.014972 -13.967

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.087
log_between 0.323  0.023
sexM        -0.213  0.000 -0.169
age         -0.749 -0.011  0.107 -0.061
wakeupTm_dc -0.459 -0.189 -0.123  0.002  0.057

Robustness weights for the residuals:
4480 weights are ~= 1. The remaining 1177 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.556   0.741   0.718  0.912   0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.469  0.755   0.874   0.840  0.963   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5650) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.14 | 0.34 | [ 5.46, 6.81] | 17.82 | < .001
log within | 0.05 | 9.34e-03 | [ 0.03, 0.07] | 5.22 | < .001
log between | 0.11 | 0.07 | [-0.03, 0.25] | 1.56 | 0.118
sex [M] | -0.26 | 0.24 | [-0.74, 0.21] | -1.08 | 0.282
age | -0.04 | 7.36e-03 | [-0.05, -0.02] | -5.23 | < .001
wakeupTime dec | -0.21 | 0.01 | [-0.24, -0.18] | -13.97 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.36
SD (Residual) | 1.26

```

```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_1_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9657 -0.6169 -0.0786 0.6124 7.0381

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.845 1.358
Residual 1.587 1.260
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.195436 0.379186 16.339
log_within 0.081694 0.011797 6.925
log_between 0.082330 0.083689 0.984
sexM -0.201696 0.240226 -0.840
age -0.038996 0.007369 -5.292
wakeupTime_dec -0.212280 0.014898 -14.249

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.070
log_between 0.511 0.018
sexM -0.196 0.001 -0.098
age -0.652 -0.009 0.116 -0.055
wakeupTm_dc -0.436 -0.160 -0.110 -0.009 0.057

Robustness weights for the residuals:
4487 weights are ~= 1. The remaining 1174 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.191 0.554 0.745 0.718 0.908 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.464 0.752 0.887 0.836 0.936 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	6.20	0.38	[5.45, 6.94]	16.34	< .001
log within	0.08	0.01	[0.06, 0.10]	6.92	< .001
log between	0.08	0.08	[-0.08, 0.25]	0.98	0.325
sex [M]	-0.20	0.24	[-0.67, 0.27]	-0.84	0.401
age	-0.04	7.37e-03	[-0.05, -0.02]	-5.29	< .001
wakeupTime dec	-0.21	0.01	[-0.24, -0.18]	-14.25	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.26


```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_2_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9826 -0.6160 -0.0740 0.6147 7.0080

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.821 1.349
Residual 1.600 1.265
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.209015 0.419408 14.804
log_within 0.055987 0.015270 3.666
log_between 0.088293 0.096669 0.913
sexM -0.181884 0.237578 -0.766
age -0.039092 0.007303 -5.353
wakeupTime_dec -0.208257 0.015021 -13.864

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.075
log_between 0.632 0.018
sexM -0.127 0.004 0.006
age -0.585 -0.011 0.088 -0.043
wakeupTm_dc -0.411 -0.183 -0.101 -0.021 0.061

Robustness weights for the residuals:
4490 weights are ~= 1. The remaining 1171 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.192 0.558 0.752 0.717 0.908 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.464 0.745 0.868 0.823 0.920 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	6.21	0.42	[5.39, 7.03]	14.80	< .001
log within	0.06	0.02	[0.03, 0.09]	3.67	< .001
log between	0.09	0.10	[-0.10, 0.28]	0.91	0.361
sex [M]	-0.18	0.24	[-0.65, 0.28]	-0.77	0.444
age	-0.04	7.30e-03	[-0.05, -0.02]	-5.35	< .001
wakeupTime dec	-0.21	0.02	[-0.24, -0.18]	-13.86	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	1.26

```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_3_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9553 -0.6131 -0.0748 0.6180 6.9983

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.846 1.359
Residual 1.597 1.264
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 6.198329 0.517141 11.986
log_within 0.074525 0.018519 4.024
log_between 0.073309 0.131440 0.558
sexM -0.174764 0.239853 -0.729
age -0.039739 0.007335 -5.418
wakeupTime_dec -0.207235 0.015024 -13.793

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.054
log_between 0.775 0.012
sexM -0.047 0.004 0.077
age -0.480 -0.011 0.058 -0.040
wakeupTm_dc -0.341 -0.158 -0.074 -0.025 0.066

Robustness weights for the residuals:
4488 weights are ~= 1. The remaining 1173 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.192 0.557 0.752 0.717 0.901 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.466 0.743 0.875 0.818 0.918 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	6.20	0.52	[5.18, 7.21]	11.99	< .001
log within	0.07	0.02	[0.04, 0.11]	4.02	< .001
log between	0.07	0.13	[-0.18, 0.33]	0.56	0.577
sex [M]	-0.17	0.24	[-0.64, 0.30]	-0.73	0.466
age	-0.04	7.33e-03	[-0.05, -0.03]	-5.42	< .001
wakeupTime dec	-0.21	0.02	[-0.24, -0.18]	-13.79	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.26

```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_4_5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9502 -0.6140 -0.0763 0.6185 6.9930

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.844 1.358
Residual 1.599 1.264
Number of obs: 5661, groups: id, 172

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.976400 0.590192 10.126
log_within 0.089128 0.022753 3.917
log_between 0.019621 0.149633 0.131
sexM -0.185940 0.241605 -0.770
age -0.039866 0.007321 -5.445
wakeupTime_dec -0.199886 0.014865 -13.447

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.028
log_between 0.834 0.004
sexM 0.030 0.003 0.147
age -0.481 -0.007 -0.026 -0.047
wakeupTm_dc -0.279 -0.099 -0.039 -0.025 0.072

Robustness weights for the residuals:
4482 weights are ~= 1. The remaining 1179 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.192 0.558 0.751 0.718 0.908 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.465 0.736 0.872 0.823 0.935 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	5.98	0.59	[4.82, 7.13]	10.13	< .001
log within	0.09	0.02	[0.04, 0.13]	3.92	< .001
log between	0.02	0.15	[-0.27, 0.31]	0.13	0.896
sex [M]	-0.19	0.24	[-0.66, 0.29]	-0.77	0.442
age	-0.04	7.32e-03	[-0.05, -0.03]	-5.45	< .001
wakeupTime dec	-0.20	0.01	[-0.23, -0.17]	-13.45	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.36
SD (Residual)	1.26

```
=====
OUTCOME: sleepiness
EXPOSURE: LAN_5_sunrise
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-4.0168 -0.6101 -0.0713  0.6156  7.0309
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.819     1.349
Residual                   1.588     1.260
Number of obs: 5661, groups: id, 172
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.97380   0.69514   7.155
log_within     -0.01731   0.02550  -0.679
log_between    -0.25655   0.18533  -1.384
sexM            -0.26093   0.24409  -1.069
age            -0.03819   0.00732  -5.217
wakeupTime_dec -0.19222   0.01471 -13.065
```

```
Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.002
log_between    0.885  0.000
sexM           0.129  0.000  0.233
age           -0.489 -0.001 -0.117 -0.070
wakeupTm_dc -0.185 -0.007  0.025 -0.013  0.068
```

```
Robustness weights for the residuals:
4486 weights are ~= 1. The remaining 1175 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.556   0.750   0.716  0.903   0.999
```

```
Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.460  0.709   0.800   0.822  0.968   0.996
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5654)	p
(Intercept)	4.97	0.70	[3.61, 6.34]	7.16	< .001
log within	-0.02	0.03	[-0.07, 0.03]	-0.68	0.497
log between	-0.26	0.19	[-0.62, 0.11]	-1.38	0.166
sex [M]	-0.26	0.24	[-0.74, 0.22]	-1.07	0.285
age	-0.04	7.32e-03	[-0.05, -0.02]	-5.22	< .001
wakeupTime dec	-0.19	0.01	[-0.22, -0.16]	-13.06	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	1.26

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_0.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9123 -0.6066 -0.0682 0.6134 6.8921

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.721 1.312
Residual 1.618 1.272
Number of obs: 4982, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.984808 0.317195 12.563
log_within -0.003842 0.007668 -0.501
log_between 0.112842 0.063813 1.768
sexM -0.158765 0.233146 -0.681
age -0.030580 0.007295 -4.192
ms -0.050377 0.020529 -2.454

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.036
log_between -0.218 0.001
sexM -0.154 0.003 -0.027
age -0.856 -0.007 0.121 -0.056
ms -0.375 -0.099 -0.012 -0.037 0.080

Robustness weights for the residuals:
3954 weights are ~= 1. The remaining 1028 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.563 0.746 0.722 0.919 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.502 0.735 0.884 0.858 0.981 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4975)	p
(Intercept)	3.98	0.32	[3.36, 4.61]	12.56	< .001
log within	-3.84e-03	7.67e-03	[-0.02, 0.01]	-0.50	0.616
log between	0.11	0.06	[-0.01, 0.24]	1.77	0.077
sex [M]	-0.16	0.23	[-0.62, 0.30]	-0.68	0.496
age	-0.03	7.29e-03	[-0.04, -0.02]	-4.19	< .001
ms	-0.05	0.02	[-0.09, -0.01]	-2.45	0.014

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.31
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.8938 -0.6020 -0.0700 0.6196 6.8761

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.760 1.327
Residual 1.634 1.278
Number of obs: 4975, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.953467 0.371370 10.646
log_within -0.011819 0.008697 -1.359
log_between 0.046030 0.072501 0.635
sexM -0.175897 0.235560 -0.747
age -0.031825 0.007365 -4.321
ms -0.043088 0.020560 -2.096

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.020
log_between -0.540 -0.001
sexM -0.135 0.002 -0.006
age -0.778 -0.004 0.113 -0.053
ms -0.327 -0.063 0.007 -0.037 0.082

Robustness weights for the residuals:
3945 weights are ~= 1. The remaining 1030 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.196 0.562 0.748 0.723 0.911 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.505 0.758 0.925 0.867 0.985 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4968)	p
(Intercept)	3.95	0.37	[3.23, 4.68]	10.65	< .001
log within	-0.01	8.70e-03	[-0.03, 0.01]	-1.36	0.174
log between	0.05	0.07	[-0.10, 0.19]	0.63	0.526
sex [M]	-0.18	0.24	[-0.64, 0.29]	-0.75	0.455
age	-0.03	7.37e-03	[-0.05, -0.02]	-4.32	< .001
ms	-0.04	0.02	[-0.08, 0.00]	-2.10	0.036

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.28

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9106 -0.6030 -0.0670 0.6138 6.8901

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.759 1.326
Residual 1.625 1.275
Number of obs: 4980, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.972019 0.345292 11.503
log_within -0.006733 0.008043 -0.837
log_between 0.064520 0.066509 0.970
sexM -0.156221 0.235511 -0.663
age -0.031417 0.007393 -4.250
ms -0.050325 0.020573 -2.446

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.032
log_between -0.425 0.000
sexM -0.148 0.003 -0.001
age -0.829 -0.007 0.144 -0.053
ms -0.348 -0.093 -0.001 -0.037 0.081

Robustness weights for the residuals:
3950 weights are ~= 1. The remaining 1030 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.564 0.747 0.722 0.914 0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.502 0.740 0.876 0.846 0.973 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4973)	p
(Intercept)	3.97	0.35	[3.30, 4.65]	11.50	< .001
log within	-6.73e-03	8.04e-03	[-0.02, 0.01]	-0.84	0.403
log between	0.06	0.07	[-0.07, 0.19]	0.97	0.332
sex [M]	-0.16	0.24	[-0.62, 0.31]	-0.66	0.507
age	-0.03	7.39e-03	[-0.05, -0.02]	-4.25	< .001
ms	-0.05	0.02	[-0.09, -0.01]	-2.45	0.014

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_2.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9109 -0.6069 -0.0680 0.6222 6.9013

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.758 1.326
Residual 1.630 1.277
Number of obs: 4954, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.040710 0.424783 9.512
log_within -0.044285 0.010217 -4.334
log_between -0.002328 0.084754 -0.027
sexM -0.193556 0.235522 -0.822
age -0.032545 0.007336 -4.436
ms -0.029923 0.020863 -1.434

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.018
log_between -0.676 -0.001
sexM -0.109 0.002 -0.017
age -0.678 -0.004 0.072 -0.054
ms -0.295 -0.064 0.016 -0.038 0.082

Robustness weights for the residuals:
3931 weights are ~= 1. The remaining 1023 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.562 0.751 0.722 0.916 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.506 0.806 0.946 0.877 0.982 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4947)	p
(Intercept)	4.04	0.42	[3.21, 4.87]	9.51	< .001
log within	-0.04	0.01	[-0.06, -0.02]	-4.33	< .001
log between	-2.33e-03	0.08	[-0.17, 0.16]	-0.03	0.978
sex [M]	-0.19	0.24	[-0.66, 0.27]	-0.82	0.411
age	-0.03	7.34e-03	[-0.05, -0.02]	-4.44	< .001
ms	-0.03	0.02	[-0.07, 0.01]	-1.43	0.152

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.28


```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9289 -0.6033 -0.0671 0.6240 6.8954

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.775 1.332
Residual 1.631 1.277
Number of obs: 4961, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.028596 0.395523 10.185
log_within -0.028454 0.009355 -3.042
log_between 0.003101 0.076699 0.040
sexM -0.186452 0.236608 -0.788
age -0.032314 0.007384 -4.376
ms -0.032868 0.020710 -1.587

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.609 -0.001
sexM -0.116 0.002 -0.023
age -0.737 -0.004 0.099 -0.055
ms -0.312 -0.057 0.013 -0.038 0.082

Robustness weights for the residuals:
3940 weights are ~= 1. The remaining 1021 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.560 0.741 0.721 0.911 0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 36 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.510 0.808 0.943 0.881 0.982 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4954)	p
(Intercept)	4.03	0.40	[3.25, 4.80]	10.19	< .001
log within	-0.03	9.36e-03	[-0.05, -0.01]	-3.04	0.002
log between	3.10e-03	0.08	[-0.15, 0.15]	0.04	0.968
sex [M]	-0.19	0.24	[-0.65, 0.28]	-0.79	0.431
age	-0.03	7.38e-03	[-0.05, -0.02]	-4.38	< .001
ms	-0.03	0.02	[-0.07, 0.01]	-1.59	0.113

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.28

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_3.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9962 -0.6040 -0.0602 0.6221 6.9230

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.755 1.325
Residual 1.610 1.269
Number of obs: 4934, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.226100 0.464070 9.107
log_within -0.061209 0.011951 -5.122
log_between -0.041090 0.093869 -0.438
sexM -0.180571 0.235385 -0.767
age -0.033112 0.007312 -4.528
ms -0.035635 0.021199 -1.681

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.015
log_between -0.738 -0.002
sexM -0.085 0.002 -0.034
age -0.597 -0.003 0.028 -0.053
ms -0.286 -0.053 0.030 -0.039 0.082

Robustness weights for the residuals:
3907 weights are ~= 1. The remaining 1027 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.194 0.559 0.748 0.722 0.918 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.506 0.788 0.910 0.861 0.971 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4927)	p
(Intercept)	4.23	0.46	[3.32, 5.14]	9.11	< .001
log within	-0.06	0.01	[-0.08, -0.04]	-5.12	< .001
log between	-0.04	0.09	[-0.23, 0.14]	-0.44	0.662
sex [M]	-0.18	0.24	[-0.64, 0.28]	-0.77	0.443
age	-0.03	7.31e-03	[-0.05, -0.02]	-4.53	< .001
ms	-0.04	0.02	[-0.08, 0.01]	-1.68	0.093

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9663 -0.6035 -0.0644 0.6236 6.9055

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.760 1.327
Residual 1.622 1.274
Number of obs: 4946, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.143032 0.445008 9.310
log_within -0.049799 0.011066 -4.500
log_between -0.025481 0.089165 -0.286
sexM -0.192200 0.235723 -0.815
age -0.032923 0.007331 -4.491
ms -0.031473 0.020913 -1.505

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.017
log_between -0.711 -0.002
sexM -0.095 0.002 -0.029
age -0.639 -0.004 0.053 -0.054
ms -0.287 -0.060 0.021 -0.039 0.081

Robustness weights for the residuals:
3921 weights are ~= 1. The remaining 1025 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.560 0.749 0.721 0.918 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.506 0.795 0.917 0.863 0.970 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4939)	p
(Intercept)	4.14	0.45	[3.27, 5.02]	9.31	< .001
log within	-0.05	0.01	[-0.07, -0.03]	-4.50	< .001
log between	-0.03	0.09	[-0.20, 0.15]	-0.29	0.775
sex [M]	-0.19	0.24	[-0.65, 0.27]	-0.82	0.415
age	-0.03	7.33e-03	[-0.05, -0.02]	-4.49	< .001
ms	-0.03	0.02	[-0.07, 0.01]	-1.50	0.132

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_4.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9223 -0.6066 -0.0618 0.6210 6.9152

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.758 1.326
Residual 1.606 1.267
Number of obs: 4877, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.352586 0.497398 8.751
log_within -0.091893 0.013467 -6.824
log_between -0.088064 0.102320 -0.861
sexM -0.162858 0.235665 -0.691
age -0.032567 0.007319 -4.450
ms -0.024482 0.022044 -1.111

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.011
log_between -0.775 -0.002
sexM -0.086 0.002 -0.020
age -0.518 -0.003 -0.027 -0.052
ms -0.282 -0.040 0.041 -0.043 0.078

Robustness weights for the residuals:
3861 weights are ~= 1. The remaining 1016 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.194 0.555 0.753 0.722 0.917 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.517 0.776 0.866 0.851 0.970 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4870)	p
(Intercept)	4.35	0.50	[3.38, 5.33]	8.75	< .001
log within	-0.09	0.01	[-0.12, -0.07]	-6.82	< .001
log between	-0.09	0.10	[-0.29, 0.11]	-0.86	0.389
sex [M]	-0.16	0.24	[-0.62, 0.30]	-0.69	0.490
age	-0.03	7.32e-03	[-0.05, -0.02]	-4.45	< .001
ms	-0.02	0.02	[-0.07, 0.02]	-1.11	0.267

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_4
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9148 -0.6014 -0.0635 0.6204 6.9008

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.758 1.326
Residual 1.616 1.271
Number of obs: 4906, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.216526 0.483986 8.712
log_within -0.074394 0.012837 -5.795
log_between -0.052924 0.098698 -0.536
sexM -0.183547 0.235678 -0.779
age -0.032703 0.007318 -4.469
ms -0.023997 0.021691 -1.106

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.013
log_between -0.761 -0.002
sexM -0.088 0.002 -0.023
age -0.556 -0.003 0.003 -0.053
ms -0.281 -0.049 0.034 -0.043 0.079

Robustness weights for the residuals:
3880 weights are ~= 1. The remaining 1026 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.560 0.753 0.723 0.919 0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.511 0.798 0.907 0.862 0.971 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4899)	p
(Intercept)	4.22	0.48	[3.27, 5.17]	8.71	< .001
log within	-0.07	0.01	[-0.10, -0.05]	-5.80	< .001
log between	-0.05	0.10	[-0.25, 0.14]	-0.54	0.592
sex [M]	-0.18	0.24	[-0.65, 0.28]	-0.78	0.436
age	-0.03	7.32e-03	[-0.05, -0.02]	-4.47	< .001
ms	-0.02	0.02	[-0.07, 0.02]	-1.11	0.269

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_5.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9403 -0.6053 -0.0645 0.6204 6.9053

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.734 1.317
Residual 1.608 1.268
Number of obs: 4761, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.651671 0.527054 8.826
log_within -0.102814 0.015127 -6.797
log_between -0.140268 0.108421 -1.294
sexM -0.146408 0.234654 -0.624
age -0.032971 0.007288 -4.524
ms -0.035818 0.023485 -1.525

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.001
log_between -0.801 0.000
sexM -0.098 0.000 0.003
age -0.477 0.000 -0.038 -0.051
ms -0.287 -0.006 0.050 -0.043 0.077

Robustness weights for the residuals:
3770 weights are ~= 1. The remaining 991 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.558 0.758 0.724 0.917 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.523 0.731 0.855 0.841 0.968 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4754)	p
(Intercept)	4.65	0.53	[3.62, 5.68]	8.83	< .001
log within	-0.10	0.02	[-0.13, -0.07]	-6.80	< .001
log between	-0.14	0.11	[-0.35, 0.07]	-1.29	0.196
sex [M]	-0.15	0.23	[-0.61, 0.31]	-0.62	0.533
age	-0.03	7.29e-03	[-0.05, -0.02]	-4.52	< .001
ms	-0.04	0.02	[-0.08, 0.01]	-1.53	0.127

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9545 -0.6085 -0.0602 0.6183 6.9012

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.746 1.321
Residual 1.609 1.269
Number of obs: 4823, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.606832 0.508545 9.059
log_within -0.104596 0.014390 -7.269
log_between -0.138268 0.104694 -1.321
sexM -0.153655 0.235004 -0.654
age -0.032548 0.007304 -4.456
ms -0.035261 0.022702 -1.553

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.006
log_between -0.785 -0.001
sexM -0.086 0.001 -0.017
age -0.494 -0.002 -0.041 -0.052
ms -0.286 -0.022 0.044 -0.043 0.079

Robustness weights for the residuals:
3822 weights are ~= 1. The remaining 1001 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.559 0.753 0.722 0.916 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.522 0.741 0.863 0.846 0.968 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4816)	p
(Intercept)	4.61	0.51	[3.61, 5.60]	9.06	< .001
log within	-0.10	0.01	[-0.13, -0.08]	-7.27	< .001
log between	-0.14	0.10	[-0.34, 0.07]	-1.32	0.187
sex [M]	-0.15	0.24	[-0.61, 0.31]	-0.65	0.513
age	-0.03	7.30e-03	[-0.05, -0.02]	-4.46	< .001
ms	-0.04	0.02	[-0.08, 0.01]	-1.55	0.120

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.27

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_6.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.0076 -0.6097 -0.0602 0.6180 6.9770

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.743 1.320
Residual 1.580 1.257
Number of obs: 4580, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.881109 0.518895 9.407
log_within -0.114951 0.016805 -6.840
log_between -0.200438 0.103831 -1.930
sexM -0.179883 0.235971 -0.762
age -0.033256 0.007315 -4.546
ms -0.021821 0.025370 -0.860

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.008
log_between -0.789 0.002
sexM -0.126 -0.001 0.038
age -0.478 0.002 -0.050 -0.054
ms -0.300 0.027 0.048 -0.043 0.071

Robustness weights for the residuals:
3651 weights are ~= 1. The remaining 929 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.193 0.556 0.752 0.719 0.912 0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.533 0.718 0.835 0.842 0.972 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4573)	p
(Intercept)	4.88	0.52	[3.86, 5.90]	9.41	< .001
log within	-0.11	0.02	[-0.15, -0.08]	-6.84	< .001
log between	-0.20	0.10	[-0.40, 0.00]	-1.93	0.054
sex [M]	-0.18	0.24	[-0.64, 0.28]	-0.76	0.446
age	-0.03	7.31e-03	[-0.05, -0.02]	-4.55	< .001
ms	-0.02	0.03	[-0.07, 0.03]	-0.86	0.390

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.26


```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_6
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-3.9416 -0.6043 -0.0607 0.6199 6.9354

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.734 1.317
Residual 1.597 1.264
Number of obs: 4678, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.717260 0.514144 9.175
log_within -0.108778 0.015883 -6.849
log_between -0.157649 0.103174 -1.528
sexM -0.177895 0.235049 -0.757
age -0.033170 0.007292 -4.549
ms -0.027584 0.024405 -1.130

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.001
log_between -0.787 0.000
sexM -0.112 0.000 0.019
age -0.488 0.000 -0.041 -0.053
ms -0.299 0.002 0.051 -0.043 0.074

Robustness weights for the residuals:
3712 weights are ~= 1. The remaining 966 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.194 0.557 0.757 0.722 0.910 0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.525 0.714 0.849 0.840 0.966 0.991

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4671)	p
(Intercept)	4.72	0.51	[3.71, 5.73]	9.17	< .001
log within	-0.11	0.02	[-0.14, -0.08]	-6.85	< .001
log between	-0.16	0.10	[-0.36, 0.04]	-1.53	0.127
sex [M]	-0.18	0.24	[-0.64, 0.28]	-0.76	0.449
age	-0.03	7.29e-03	[-0.05, -0.02]	-4.55	< .001
ms	-0.03	0.02	[-0.08, 0.02]	-1.13	0.258

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.26

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_7.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4582 -0.6103 -0.0590 0.6213 7.1135

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.803 1.343
Residual 1.524 1.234
Number of obs: 4197, groups: id, 170

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.854478 0.543820 8.927
log_within -0.120885 0.018320 -6.599
log_between -0.219241 0.108348 -2.023
sexM -0.211562 0.241732 -0.875
age -0.033527 0.007456 -4.497
ms 0.019246 0.028484 0.676

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.010
log_between -0.796 0.002
sexM -0.118 -0.001 0.033
age -0.470 0.002 -0.042 -0.056
ms -0.303 0.030 0.046 -0.044 0.064

Robustness weights for the residuals:
3354 weights are ~= 1. The remaining 843 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.189 0.555 0.752 0.719 0.912 0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 26 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.556 0.763 0.824 0.826 0.948 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4190)	p
(Intercept)	4.85	0.54	[3.79, 5.92]	8.93	< .001
log within	-0.12	0.02	[-0.16, -0.08]	-6.60	< .001
log between	-0.22	0.11	[-0.43, -0.01]	-2.02	0.043
sex [M]	-0.21	0.24	[-0.69, 0.26]	-0.88	0.382
age	-0.03	7.46e-03	[-0.05, -0.02]	-4.50	< .001
ms	0.02	0.03	[-0.04, 0.08]	0.68	0.499

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	1.23

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_7
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.2118 -0.6102 -0.0641 0.6220 7.0612

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.755 1.325
Residual 1.544 1.243
Number of obs: 4426, groups: id, 171

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.985618 0.527381 9.454
log_within -0.117848 0.017538 -6.719
log_between -0.209016 0.104981 -1.991
sexM -0.143159 0.237820 -0.602
age -0.034156 0.007348 -4.648
ms -0.025544 0.026518 -0.963

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.008
log_between -0.792 0.001
sexM -0.124 -0.001 0.038
age -0.475 0.002 -0.046 -0.056
ms -0.297 0.024 0.044 -0.042 0.065

Robustness weights for the residuals:
3543 weights are ~= 1. The remaining 883 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.190 0.554 0.748 0.717 0.913 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.537 0.729 0.821 0.832 0.960 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4419)	p
(Intercept)	4.99	0.53	[3.95, 6.02]	9.45	< .001
log within	-0.12	0.02	[-0.15, -0.08]	-6.72	< .001
log between	-0.21	0.10	[-0.41, 0.00]	-1.99	0.047
sex [M]	-0.14	0.24	[-0.61, 0.32]	-0.60	0.547
age	-0.03	7.35e-03	[-0.05, -0.02]	-4.65	< .001
ms	-0.03	0.03	[-0.08, 0.03]	-0.96	0.335

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	1.24

```

=====
OUTCOME: sleepiness
EXPOSURE: LaW_8
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.6532 -0.6112 -0.0508  0.6236  7.1409

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.711     1.308
Residual                   1.519     1.232
Number of obs: 3836, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)  4.860465   0.530195   9.167
log_within   -0.122316   0.019709  -6.206
log_between  -0.239313   0.104667  -2.286
sexM         -0.269655   0.239718  -1.125
age          -0.034322   0.007322  -4.688
ms           0.044356   0.031656   1.401

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.015
log_between -0.783  0.002
sexM        -0.124 -0.002  0.048
age         -0.472  0.003 -0.047 -0.067
ms          -0.327  0.043  0.044 -0.039  0.061

Robustness weights for the residuals:
3072 weights are ~= 1. The remaining 764 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.188  0.554   0.756   0.717  0.910   0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.528  0.748   0.844   0.834  0.966   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3829) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.86 | 0.53 | [ 3.82, 5.90] | 9.17 | < .001
log within | -0.12 | 0.02 | [-0.16, -0.08] | -6.21 | < .001
log between | -0.24 | 0.10 | [-0.44, -0.03] | -2.29 | 0.022
sex [M] | -0.27 | 0.24 | [-0.74, 0.20] | -1.12 | 0.261
age | -0.03 | 7.32e-03 | [-0.05, -0.02] | -4.69 | < .001
ms | 0.04 | 0.03 | [-0.02, 0.11] | 1.40 | 0.161

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.31
SD (Residual) | 1.23

```

```
=====
OUTCOME: sleepiness
EXPOSURE: LaW_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.8830 -0.6104 -0.0685 0.6102 7.1406

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.692 1.301
Residual 1.540 1.241
Number of obs: 4069, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 5.399077 0.526342 10.258
log_within -0.126484 0.020535 -6.159
log_between -0.271639 0.106110 -2.560
sexM -0.336343 0.236322 -1.423
age -0.038276 0.007175 -5.334
ms 0.012691 0.029527 0.430

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.006
log_between -0.794 0.000
sexM -0.101 0.001 0.008
age -0.498 -0.001 -0.014 -0.054
ms -0.287 -0.022 0.032 -0.046 0.067

Robustness weights for the residuals:
3233 weights are ~= 1. The remaining 836 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.188 0.559 0.739 0.713 0.902 0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 26 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.539 0.710 0.798 0.790 0.894 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4062)	p
(Intercept)	5.40	0.53	[4.37, 6.43]	10.26	< .001
log within	-0.13	0.02	[-0.17, -0.09]	-6.16	< .001
log between	-0.27	0.11	[-0.48, -0.06]	-2.56	0.011
sex [M]	-0.34	0.24	[-0.80, 0.13]	-1.42	0.155
age	-0.04	7.18e-03	[-0.05, -0.02]	-5.33	< .001
ms	0.01	0.03	[-0.05, 0.07]	0.43	0.667

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.30
SD (Residual)	1.24

```

=====
OUTCOME: who5
EXPOSURE: DAY_10_11
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3342 -0.6151  0.0472  0.6030  4.1131

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.90     4.231
Residual                12.41     3.523
Number of obs: 5660, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.29079    1.05980    4.992
log_within     0.11461    0.02382    4.811
log_between    0.54971    0.17048    3.224
sexM           2.06850    0.74346    2.782
age            0.06966    0.02371    2.938
wakeupTime_dec 0.41040    0.04475    9.171

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.176
log_between  -0.319  0.052
sexM          -0.185 -0.004  0.069
age           -0.668  0.010 -0.288 -0.061
wakeupTm_dc  -0.449  0.392  0.133 -0.010  0.027

Robustness weights for the residuals:
4432 weights are ~= 1. The remaining 1228 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.310  0.620  0.766  0.750  0.910  0.999

Robustness weights for the random effects:
148 weights are ~= 1. The remaining 24 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.508  0.714  0.814  0.807  0.927  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5653) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.29 | 1.06 | [3.21, 7.37] | 4.99 | < .001
log within | 0.11 | 0.02 | [0.07, 0.16] | 4.81 | < .001
log between | 0.55 | 0.17 | [0.22, 0.88] | 3.22 | 0.001
sex [M] | 2.07 | 0.74 | [0.61, 3.53] | 2.78 | 0.005
age | 0.07 | 0.02 | [0.02, 0.12] | 2.94 | 0.003
wakeupTime dec | 0.41 | 0.04 | [0.32, 0.50] | 9.17 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.23
SD (Residual) | 3.52

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_11_12
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.5191 -0.6085  0.0460  0.6145  4.1681

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.28     4.276
Residual                   12.38     3.518
Number of obs: 5660, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.77749    1.18127    4.044
log_within      0.17608    0.02636    6.679
log_between     0.52502    0.20330    2.583
sexM            1.93840    0.74972    2.586
age             0.07720    0.02362    3.268
wakeupTime_dec  0.40450    0.04309    9.387

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.127
log_between -0.524  0.035
sexM        -0.166 -0.004  0.034
age         -0.571  0.011 -0.239 -0.050
wakeupTm_dc -0.413  0.308  0.115 -0.014  0.035

Robustness weights for the residuals:
4426 weights are ~= 1. The remaining 1234 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.298  0.622  0.771  0.752  0.909  0.999

Robustness weights for the random effects:
144 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.516  0.747  0.821  0.829  0.958  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5653) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.78 | 1.18 | [2.46, 7.09] | 4.04 | < .001
log within | 0.18 | 0.03 | [0.12, 0.23] | 6.68 | < .001
log between | 0.53 | 0.20 | [0.13, 0.92] | 2.58 | 0.010
sex [M] | 1.94 | 0.75 | [0.47, 3.41] | 2.59 | 0.010
age | 0.08 | 0.02 | [0.03, 0.12] | 3.27 | 0.001
wakeupTime dec | 0.40 | 0.04 | [0.32, 0.49] | 9.39 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.28
SD (Residual) | 3.52

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_12_13
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4808 -0.6029  0.0423  0.6101  4.1963

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.70     4.324
Residual                  12.45     3.528
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.13812    1.37507   3.737
log_within      0.19463    0.02947   6.604
log_between     0.37886    0.25246   1.501
sexM            1.93342    0.75845   2.549
age             0.08536    0.02360   3.617
wakeupTime_dec  0.37985    0.04210   9.022

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.077
log_between  -0.677  0.021
sexM         -0.160 -0.003  0.045
age          -0.485  0.009 -0.185 -0.051
wakeupTm_dc -0.366  0.211  0.101 -0.012  0.042

Robustness weights for the residuals:
4429 weights are ~= 1. The remaining 1232 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.300  0.623  0.777  0.753  0.908  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.517  0.755  0.858  0.834  0.966  0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.14 | 1.38 | [ 2.44, 7.83] | 3.74 | < .001
log within | 0.19 | 0.03 | [ 0.14, 0.25] | 6.60 | < .001
log between | 0.38 | 0.25 | [-0.12, 0.87] | 1.50 | 0.133
sex [M] | 1.93 | 0.76 | [ 0.45, 3.42] | 2.55 | 0.011
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.62 | < .001
wakeupTime dec | 0.38 | 0.04 | [ 0.30, 0.46] | 9.02 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.32
SD (Residual) | 3.53

```



```

=====
OUTCOME: who5
EXPOSURE: DAY_13_14
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4950 -0.6050  0.0376  0.6087  4.0792

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.44     4.294
Residual                   12.42     3.524
Number of obs: 5659, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.89806    1.57912    3.102
log_within      0.18157    0.02911    6.238
log_between     0.50871    0.30610    1.662
sexM            1.98041    0.75372    2.628
age             0.08458    0.02329    3.631
wakeupTime_dec  0.34284    0.04146    8.270

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.046
log_between -0.772  0.011
sexM        -0.155 -0.002  0.057
age         -0.416  0.007 -0.150 -0.051
wakeupTm_dc -0.314  0.145  0.075 -0.013  0.050

Robustness weights for the residuals:
4433 weights are ~= 1. The remaining 1226 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.299  0.623   0.772   0.753   0.910   0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.508  0.739   0.797   0.813   0.934   0.985

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5652) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.90 | 1.58 | [ 1.80, 7.99] | 3.10 | 0.002
log within | 0.18 | 0.03 | [ 0.12, 0.24] | 6.24 | < .001
log between | 0.51 | 0.31 | [-0.09, 1.11] | 1.66 | 0.097
sex [M] | 1.98 | 0.75 | [ 0.50, 3.46] | 2.63 | 0.009
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.63 | < .001
wakeupTime dec | 0.34 | 0.04 | [ 0.26, 0.42] | 8.27 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.29
SD (Residual) | 3.52

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_14_15
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4490 -0.6139  0.0411  0.6084  4.1569

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.47     4.297
Residual                   12.45     3.529
Number of obs: 5659, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.44720    1.64621   3.309
log_within      0.17288    0.02669   6.478
log_between     0.40229    0.31679   1.270
sexM            1.96525    0.75571   2.601
age             0.08753    0.02310   3.789
wakeupTime_dec  0.32291    0.04123   7.832

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within   -0.024
log_between  -0.792  0.004
sexM          -0.172 -0.001  0.082
age           -0.460  0.005 -0.068 -0.048
wakeupTm_dc  -0.279  0.088  0.043 -0.013  0.059

Robustness weights for the residuals:
4428 weights are ~= 1. The remaining 1231 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.302  0.626  0.771  0.755  0.917  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.498  0.755  0.831  0.828  0.971  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5652) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.45 | 1.65 | [ 2.22, 8.67] | 3.31 | < .001
log within | 0.17 | 0.03 | [ 0.12, 0.23] | 6.48 | < .001
log between | 0.40 | 0.32 | [-0.22, 1.02] | 1.27 | 0.204
sex [M] | 1.97 | 0.76 | [ 0.48, 3.45] | 2.60 | 0.009
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.79 | < .001
wakeupTime dec | 0.32 | 0.04 | [ 0.24, 0.40] | 7.83 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.30
SD (Residual) | 3.53

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_15_16
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3793 -0.6064  0.0389  0.6137  3.9501

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.26     4.273
Residual                   12.47     3.531
Number of obs: 5659, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.24231    1.59713   3.282
log_within      0.16455    0.02633   6.248
log_between     0.46175    0.29799   1.550
sexM            1.88817    0.74950   2.519
age             0.09001    0.02293   3.926
wakeupTime_dec  0.31958    0.04119   7.760

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within  -0.020
log_between -0.780  0.003
sexM         -0.139 -0.001  0.037
age          -0.541  0.004  0.016 -0.042
wakeupTm_dc -0.289  0.069  0.047 -0.016  0.063

Robustness weights for the residuals:
4425 weights are ~= 1. The remaining 1234 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.307  0.624   0.774   0.754  0.910   0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.487  0.733   0.817   0.815  0.959   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5652) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.24 | 1.60 | [ 2.11, 8.37] | 3.28 | 0.001
log within | 0.16 | 0.03 | [ 0.11, 0.22] | 6.25 | < .001
log between | 0.46 | 0.30 | [-0.12, 1.05] | 1.55 | 0.121
sex [M] | 1.89 | 0.75 | [ 0.42, 3.36] | 2.52 | 0.012
age | 0.09 | 0.02 | [ 0.05, 0.13] | 3.93 | < .001
wakeupTime dec | 0.32 | 0.04 | [ 0.24, 0.40] | 7.76 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.27
SD (Residual) | 3.53

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_16_17
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.2443 -0.6098  0.0410  0.6136  3.9554

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.00     4.243
Residual                   12.41     3.523
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.42699    1.50681    2.938
log_within     0.21970    0.02673    8.218
log_between    0.72015    0.31166    2.311
sexM           1.78684    0.74499    2.398
age            0.09049    0.02276    3.976
wakeupTime_dec 0.32751    0.04097    7.994

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.021
log_between -0.752  0.003
sexM        -0.071 -0.002 -0.060
age         -0.556  0.004  0.000 -0.043
wakeupTm_dc -0.296  0.070  0.040 -0.020  0.063

Robustness weights for the residuals:
4439 weights are ~= 1. The remaining 1222 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.317  0.622   0.771   0.752   0.911   0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.475  0.724   0.827   0.816   0.940   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.43 | 1.51 | [1.47, 7.38] | 2.94 | 0.003
log within | 0.22 | 0.03 | [0.17, 0.27] | 8.22 | < .001
log between | 0.72 | 0.31 | [0.11, 1.33] | 2.31 | 0.021
sex [M] | 1.79 | 0.74 | [0.33, 3.25] | 2.40 | 0.016
age | 0.09 | 0.02 | [0.05, 0.14] | 3.98 | < .001
wakeupTime dec | 0.33 | 0.04 | [0.25, 0.41] | 7.99 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.24
SD (Residual) | 3.52

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_17_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.2678 -0.6177  0.0417  0.6076  3.8538

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.35     4.284
Residual                   12.45     3.528
Number of obs: 5655, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.22665    1.45832   3.584
log_within      0.18300    0.02857   6.404
log_between     0.61936    0.36637   1.691
sexM            1.69472    0.75651   2.240
age             0.09346    0.02300   4.064
wakeupTime_dec  0.32440    0.04108   7.896

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.016
log_between -0.727  0.001
sexM        -0.031 -0.001 -0.123
age         -0.610  0.004  0.042 -0.048
wakeupTm_dc -0.294  0.056  0.025 -0.020  0.063

Robustness weights for the residuals:
4432 weights are ~= 1. The remaining 1223 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.315  0.623   0.768   0.752  0.904   0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.493  0.763   0.836   0.840  0.966   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5648) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.23 | 1.46 | [ 2.37, 8.09] | 3.58 | < .001
log within | 0.18 | 0.03 | [ 0.13, 0.24] | 6.40 | < .001
log between | 0.62 | 0.37 | [-0.10, 1.34] | 1.69 | 0.091
sex [M] | 1.69 | 0.76 | [ 0.21, 3.18] | 2.24 | 0.025
age | 0.09 | 0.02 | [ 0.05, 0.14] | 4.06 | < .001
wakeupTime dec | 0.32 | 0.04 | [ 0.24, 0.40] | 7.90 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.28
SD (Residual) | 3.53

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_8_9
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4043 -0.6141  0.0436  0.6079  3.8533

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.09      4.254
Residual                   12.60      3.550
Number of obs: 5662, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)   7.282804   1.012048   7.196
log_within    0.006618   0.022393   0.296
log_between   0.392620   0.160957   2.439
sexM          2.091309   0.750495   2.787
age           0.078717   0.023274   3.382
wakeupTime_dec 0.322268   0.045367   7.104

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.173
log_between  0.024  0.054
sexM        -0.168 -0.002  0.112
age         -0.824  0.016 -0.193 -0.064
wakeupTm_dc -0.429  0.403  0.133 -0.004  0.041

Robustness weights for the residuals:
4425 weights are ~= 1. The remaining 1237 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.305  0.627  0.770  0.754  0.906  0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.492  0.782  0.877  0.848  0.972  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5655) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 7.28 | 1.01 | [ 5.30, 9.27] | 7.20 | < .001
log within | 6.62e-03 | 0.02 | [-0.04, 0.05] | 0.30 | 0.768
log between | 0.39 | 0.16 | [ 0.08, 0.71] | 2.44 | 0.015
sex [M] | 2.09 | 0.75 | [ 0.62, 3.56] | 2.79 | 0.005
age | 0.08 | 0.02 | [ 0.03, 0.12] | 3.38 | < .001
wakeupTime dec | 0.32 | 0.05 | [ 0.23, 0.41] | 7.10 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.25
SD (Residual) | 3.55

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_9_10
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4267 -0.6068  0.0437  0.6021  3.8718

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.14      4.259
Residual                   12.49      3.534
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)   6.792345   1.027839   6.608
log_within    0.003887   0.022737   0.171
log_between   0.421080   0.156486   2.691
sexM          2.109940   0.748829   2.818
age           0.072766   0.023577   3.086
wakeupTime_dec 0.324597   0.046194   7.027

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.201
log_between -0.150  0.062
sexM        -0.180 -0.004  0.074
age         -0.763  0.014 -0.244 -0.060
wakeupTm_dc -0.454  0.444  0.141 -0.008  0.033

Robustness weights for the residuals:
4431 weights are ~= 1. The remaining 1230 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.304  0.622  0.768  0.752  0.907  0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.505  0.757  0.910  0.844  0.951  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.79 | 1.03 | [ 4.78, 8.81] | 6.61 | < .001
log within | 3.89e-03 | 0.02 | [-0.04, 0.05] | 0.17 | 0.864
log between | 0.42 | 0.16 | [ 0.11, 0.73] | 2.69 | 0.007
sex [M] | 2.11 | 0.75 | [ 0.64, 3.58] | 2.82 | 0.005
age | 0.07 | 0.02 | [ 0.03, 0.12] | 3.09 | 0.002
wakeupTime dec | 0.32 | 0.05 | [ 0.23, 0.42] | 7.03 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.26
SD (Residual) | 3.53

```

```

=====
OUTCOME: who5
EXPOSURE: DAY_sunrise_8
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4058 -0.6114  0.0439  0.6016  3.9383

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.37     4.286
Residual                12.55     3.542
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    7.54442    1.07221    7.036
log_within     0.02381    0.02949    0.807
log_between    0.23986    0.22078    1.086
sexM           1.97167    0.75628    2.607
age            0.08831    0.02307    3.828
wakeupTime_dec 0.32039    0.04294    7.462

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.096
log_between 0.340 0.026
sexM        -0.123 -0.002 0.116
age         -0.816 0.015 -0.081 -0.052
wakeupTm_dc -0.356 0.269 0.096 -0.008 0.056

Robustness weights for the residuals:
4423 weights are ~= 1. The remaining 1238 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.305  0.625  0.773  0.754  0.908  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.485  0.756  0.834  0.824  0.947  0.994

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 7.54 | 1.07 | [ 5.44, 9.65] | 7.04 | < .001
log within | 0.02 | 0.03 | [-0.03, 0.08] | 0.81 | 0.420
log between | 0.24 | 0.22 | [-0.19, 0.67] | 1.09 | 0.277
sex [M] | 1.97 | 0.76 | [ 0.49, 3.45] | 2.61 | 0.009
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.83 | < .001
wakeupTime dec | 0.32 | 0.04 | [ 0.24, 0.40] | 7.46 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.29
SD (Residual) | 3.54

```



```
=====
OUTCOME: who5
EXPOSURE: LAN_0.5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.5463 -0.6075  0.0099  0.6057  4.0461
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.57     4.310
Residual                10.27     3.204
Number of obs: 2255, groups: id, 139
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    8.80927    1.26039    6.989
log_within      0.02731    0.03155    0.866
log_between    -0.19872    0.23939   -0.830
sexM            2.01858    0.89476    2.256
age             0.06213    0.02682    2.317
ms              0.64236    0.12214    5.259
```

```
Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.025
log_between 0.372 -0.001
sexM        -0.171 -0.003 -0.127
age         -0.837  0.004 -0.202 -0.044
ms_dia_sgnt -0.394  0.060 -0.039 -0.025  0.047
```

```
Robustness weights for the residuals:
1789 weights are ~= 1. The remaining 466 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.296  0.608   0.753   0.742   0.892   0.999
```

```
Robustness weights for the random effects:
117 weights are ~= 1. The remaining 22 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.472  0.676   0.754   0.771   0.849   0.996
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(2248)	p
(Intercept)	8.81	1.26	[6.34, 11.28]	6.99	< .001
log within	0.03	0.03	[-0.03, 0.09]	0.87	0.387
log between	-0.20	0.24	[-0.67, 0.27]	-0.83	0.407
sex [M]	2.02	0.89	[0.26, 3.77]	2.26	0.024
age	0.06	0.03	[0.01, 0.11]	2.32	0.021
ms	0.64	0.12	[0.40, 0.88]	5.26	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.31
SD (Residual)	3.20

```
=====
OUTCOME: who5
EXPOSURE: LAN_1.5
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.5629 -0.6054 0.0274 0.6100 4.1741

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.91 4.232
Residual 10.71 3.272
Number of obs: 3382, groups: id, 151

Fixed effects:
Estimate Std. Error t value
(Intercept) 8.68425 1.06694 8.139
log_within 0.06032 0.02902 2.079
log_between -0.20247 0.26406 -0.767
sexM 2.32632 0.81607 2.851
age 0.07365 0.02465 2.988
ms 0.48896 0.08908 5.489

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.016
log_between 0.078 -0.003
sexM -0.156 0.000 -0.132
age -0.853 0.002 -0.083 -0.058
ms_dia_sgnt -0.387 0.046 -0.025 -0.021 0.063

Robustness weights for the residuals:
2654 weights are ~= 1. The remaining 728 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.295 0.614 0.761 0.746 0.902 0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 25 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.486 0.684 0.805 0.794 0.938 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3375)	p
(Intercept)	8.68	1.07	[6.59, 10.78]	8.14	< .001
log within	0.06	0.03	[0.00, 0.12]	2.08	0.038
log between	-0.20	0.26	[-0.72, 0.32]	-0.77	0.443
sex [M]	2.33	0.82	[0.73, 3.93]	2.85	0.004
age	0.07	0.02	[0.03, 0.12]	2.99	0.003
ms	0.49	0.09	[0.31, 0.66]	5.49	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.23
SD (Residual)	3.27

```
=====
OUTCOME: who5
EXPOSURE: LAN_1
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4890 -0.6009 0.0196 0.6027 4.2751

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.93 4.234
Residual 10.44 3.231
Number of obs: 2829, groups: id, 145

Fixed effects:
Estimate Std. Error t value
(Intercept) 9.10936 1.13409 8.032
log_within 0.04372 0.02941 1.487
log_between -0.09643 0.25184 -0.383
sexM 2.22867 0.83772 2.660
age 0.06424 0.02530 2.539
ms 0.53426 0.10402 5.136

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.017
log_between 0.240 -0.002
sexM -0.161 0.000 -0.098
age -0.846 0.002 -0.152 -0.056
ms_dia_sgnt -0.393 0.044 -0.030 -0.023 0.050

Robustness weights for the residuals:
2233 weights are ~= 1. The remaining 596 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.300 0.605 0.766 0.742 0.892 0.998

Robustness weights for the random effects:
120 weights are ~= 1. The remaining 25 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.472 0.680 0.774 0.779 0.913 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(2822)	p
(Intercept)	9.11	1.13	[6.89, 11.33]	8.03	< .001
log within	0.04	0.03	[-0.01, 0.10]	1.49	0.137
log between	-0.10	0.25	[-0.59, 0.40]	-0.38	0.702
sex [M]	2.23	0.84	[0.59, 3.87]	2.66	0.008
age	0.06	0.03	[0.01, 0.11]	2.54	0.011
ms	0.53	0.10	[0.33, 0.74]	5.14	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.23
SD (Residual)	3.23

```
=====
OUTCOME: who5
EXPOSURE: LAN_2.5
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4696 -0.5931  0.0235  0.6168  4.2320
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    19.47    4.412
Residual                   10.93    3.305
Number of obs: 4093, groups: id, 160
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    8.67582    1.08052    8.029
log_within      0.07227    0.03027    2.387
log_between    -0.13755    0.29424   -0.467
sexM            2.37124    0.81639    2.905
age             0.08036    0.02516    3.194
ms             0.34516    0.07538    4.579
```

```
Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.016
log_between -0.157 -0.003
sexM        -0.144  0.000 -0.107
age         -0.852  0.003  0.000 -0.055
ms_dia_sgnt -0.350  0.048 -0.015 -0.020  0.065
```

```
Robustness weights for the residuals:
3208 weights are ~= 1. The remaining 885 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.301  0.617   0.765   0.749   0.914   0.999
```

```
Robustness weights for the random effects:
130 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.523  0.757   0.852   0.837   0.939   0.999
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4086)	p
(Intercept)	8.68	1.08	[6.56, 10.79]	8.03	< .001
log within	0.07	0.03	[0.01, 0.13]	2.39	0.017
log between	-0.14	0.29	[-0.71, 0.44]	-0.47	0.640
sex [M]	2.37	0.82	[0.77, 3.97]	2.90	0.004
age	0.08	0.03	[0.03, 0.13]	3.19	0.001
ms	0.35	0.08	[0.20, 0.49]	4.58	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.41
SD (Residual)	3.31

```
=====
OUTCOME: who5
EXPOSURE: LAN_2
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.4764 -0.6006 0.0303 0.6044 4.1955

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 18.66 4.320
Residual 10.88 3.298
Number of obs: 3762, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 8.68717 1.06690 8.142
log_within 0.05139 0.02972 1.729
log_between -0.32518 0.26837 -1.212
sexM 2.66605 0.82180 3.244
age 0.07620 0.02489 3.061
ms 0.41102 0.08218 5.002

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.023
log_between -0.060 -0.004
sexM -0.138 -0.001 -0.107
age -0.855 0.003 -0.023 -0.068
ms_dia_sgnt -0.369 0.067 -0.030 -0.015 0.061

Robustness weights for the residuals:
2950 weights are ~= 1. The remaining 812 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.300 0.619 0.767 0.752 0.914 0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.504 0.713 0.850 0.822 0.940 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(3755)	p
(Intercept)	8.69	1.07	[6.60, 10.78]	8.14	< .001
log within	0.05	0.03	[-0.01, 0.11]	1.73	0.084
log between	-0.33	0.27	[-0.85, 0.20]	-1.21	0.226
sex [M]	2.67	0.82	[1.05, 4.28]	3.24	0.001
age	0.08	0.02	[0.03, 0.13]	3.06	0.002
ms	0.41	0.08	[0.25, 0.57]	5.00	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.32
SD (Residual)	3.30

```

=====
OUTCOME: who5
EXPOSURE: LAN_20_21
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.2436 -0.6051  0.0416  0.6251  4.9046

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      17.87     4.227
Residual                   12.15     3.485
Number of obs: 5092, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)   11.08689    1.21579   9.119
log_within     0.03606    0.03373   1.069
log_between   -0.17838    0.36683  -0.486
sexM           2.36863    0.75562   3.135
age            0.06271    0.02308   2.717
wakeupTime_dec 0.00462    0.04319   0.107

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.004
log_between -0.562  0.000
sexM        -0.075 -0.001 -0.110
age         -0.759 -0.002  0.125 -0.066
wakeupTm_dc -0.347  0.017 -0.002 -0.021  0.066

Robustness weights for the residuals:
3966 weights are ~= 1. The remaining 1126 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.274  0.630  0.790  0.762  0.927  0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.472  0.774  0.848  0.831  0.949  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5085) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 11.09 | 1.22 | [ 8.70, 13.47] | 9.12 | < .001
log within | 0.04 | 0.03 | [-0.03, 0.10] | 1.07 | 0.285
log between | -0.18 | 0.37 | [-0.90, 0.54] | -0.49 | 0.627
sex [M] | 2.37 | 0.76 | [ 0.89, 3.85] | 3.13 | 0.002
age | 0.06 | 0.02 | [ 0.02, 0.11] | 2.72 | 0.007
wakeupTime dec | 4.62e-03 | 0.04 | [-0.08, 0.09] | 0.11 | 0.915

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.23
SD (Residual) | 3.49

```

```

=====
OUTCOME: who5
EXPOSURE: LAN_21_22
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.2440 -0.6108  0.0400  0.6270  4.9150

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.64     4.200
Residual                12.13     3.483
Number of obs: 5106, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)   11.17850    1.11468  10.028
log_within     0.03665    0.03214   1.140
log_between   -0.30724    0.31509  -0.975
sexM           2.44969    0.75563   3.242
age            0.06129    0.02292   2.674
wakeupTime_dec 0.01233    0.04334   0.284

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.001
log_between -0.440 -0.004
sexM        -0.078 -0.001 -0.157
age         -0.800 -0.001  0.118 -0.071
wakeupTm_dc -0.369  0.012 -0.027 -0.017  0.064

Robustness weights for the residuals:
3970 weights are ~= 1. The remaining 1136 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.274  0.628  0.790  0.762  0.928  0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.454  0.761  0.845  0.834  0.961  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5099) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 11.18 | 1.11 | [ 8.99, 13.36] | 10.03 | < .001
log within | 0.04 | 0.03 | [-0.03, 0.10] | 1.14 | 0.254
log between | -0.31 | 0.32 | [-0.92, 0.31] | -0.98 | 0.330
sex [M] | 2.45 | 0.76 | [ 0.97, 3.93] | 3.24 | 0.001
age | 0.06 | 0.02 | [ 0.02, 0.11] | 2.67 | 0.008
wakeupTime dec | 0.01 | 0.04 | [-0.07, 0.10] | 0.28 | 0.776

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.20
SD (Residual) | 3.48

```

```

=====
OUTCOME: who5
EXPOSURE: LAN_22_23
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.2585 -0.6064  0.0385  0.6254  4.9337

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.49      4.183
Residual                12.08      3.475
Number of obs: 5101, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)   10.96697    1.01603   10.794
log_within     0.02227    0.02733    0.815
log_between   -0.34262    0.24395   -1.404
sexM           2.58678    0.75975    3.405
age            0.06080    0.02284    2.662
wakeupTime_dec 0.01090    0.04328    0.252

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.002
log_between -0.191 -0.001
sexM        -0.119  0.002 -0.207
age         -0.840 -0.001  0.123 -0.077
wakeupTm_dc -0.403  0.005 -0.066 -0.007  0.059

Robustness weights for the residuals:
3974 weights are ~= 1. The remaining 1127 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.273  0.626  0.787  0.760  0.927  0.999

Robustness weights for the random effects:
135 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.446  0.785  0.849  0.842  0.971  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5094) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 10.97 | 1.02 | [ 8.98, 12.96] | 10.79 | < .001
log within | 0.02 | 0.03 | [-0.03, 0.08] | 0.82 | 0.415
log between | -0.34 | 0.24 | [-0.82, 0.14] | -1.40 | 0.160
sex [M] | 2.59 | 0.76 | [ 1.10, 4.08] | 3.40 | < .001
age | 0.06 | 0.02 | [ 0.02, 0.11] | 2.66 | 0.008
wakeupTime dec | 0.01 | 0.04 | [-0.07, 0.10] | 0.25 | 0.801

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.18
SD (Residual) | 3.48

```



```

=====
OUTCOME: who5
EXPOSURE: LAN_23_0
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.2699 -0.6013  0.0356  0.6216  4.9619

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.81     4.221
Residual                12.05     3.472
Number of obs: 5096, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)   10.645456   1.007623  10.565
log_within     0.040582   0.025289   1.605
log_between   -0.359161   0.209062  -1.718
sexM           2.711090   0.775145   3.498
age            0.060508   0.023004   2.630
wakeupTime_dec 0.001015   0.043391   0.023

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.017
log_between 0.081  0.002
sexM        -0.180  0.000 -0.254
age         -0.822 -0.004  0.109 -0.079
wakeupTm_dc -0.425 -0.036 -0.098  0.004  0.055

Robustness weights for the residuals:
3970 weights are ~= 1. The remaining 1126 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.271  0.628   0.782   0.759  0.924   0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.447  0.783   0.868   0.846  0.969   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5089) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 10.65 | 1.01 | [ 8.67, 12.62] | 10.56 | < .001
log within | 0.04 | 0.03 | [-0.01, 0.09] | 1.60 | 0.109
log between | -0.36 | 0.21 | [-0.77, 0.05] | -1.72 | 0.086
sex [M] | 2.71 | 0.78 | [ 1.19, 4.23] | 3.50 | < .001
age | 0.06 | 0.02 | [ 0.02, 0.11] | 2.63 | 0.009
wakeupTime dec | 1.02e-03 | 0.04 | [-0.08, 0.09] | 0.02 | 0.981

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.22
SD (Residual) | 3.47

```

```
=====
OUTCOME: who5
EXPOSURE: LAN_3
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.6140 -0.5937 0.0268 0.6241 4.1450

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 18.90 4.348
Residual 11.24 3.353
Number of obs: 4262, groups: id, 164

Fixed effects:
Estimate Std. Error t value
(Intercept) 8.70098 1.06153 8.197
log_within 0.08559 0.03261 2.624
log_between -0.06927 0.29469 -0.235
sexM 2.37657 0.79689 2.982
age 0.08179 0.02433 3.362
ms 0.32873 0.07210 4.560

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.024
log_between -0.224 -0.004
sexM -0.122 0.000 -0.098
age -0.840 0.004 0.006 -0.073
ms_dia_sgnt -0.350 0.071 -0.024 -0.022 0.070

Robustness weights for the residuals:
3336 weights are ~= 1. The remaining 926 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.292 0.622 0.776 0.755 0.915 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.515 0.756 0.841 0.834 0.951 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4255)	p
(Intercept)	8.70	1.06	[6.62, 10.78]	8.20	< .001
log within	0.09	0.03	[0.02, 0.15]	2.62	0.009
log between	-0.07	0.29	[-0.65, 0.51]	-0.24	0.814
sex [M]	2.38	0.80	[0.81, 3.94]	2.98	0.003
age	0.08	0.02	[0.03, 0.13]	3.36	< .001
ms	0.33	0.07	[0.19, 0.47]	4.56	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.35
SD (Residual)	3.35

```
=====
OUTCOME: who5
EXPOSURE: LAN_sunset
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.2871 -0.6002 0.0360 0.6211 5.1205

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 19.20 4.382
Residual 11.79 3.434
Number of obs: 4809, groups: id, 166

Fixed effects:
Estimate Std. Error t value
(Intercept) 9.87907 1.20713 8.184
log_within 0.03510 0.04738 0.741
log_between -0.14499 0.37615 -0.385
sexM 2.11633 0.78690 2.689
age 0.07864 0.02429 3.238
ms 0.12116 0.05707 2.123

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within 0.002
log_between -0.549 -0.001
sexM -0.102 0.001 -0.053
age -0.782 -0.001 0.108 -0.075
ms_dia_sgnt -0.261 0.000 -0.020 -0.034 0.073

Robustness weights for the residuals:
3750 weights are ~= 1. The remaining 1059 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.263 0.625 0.778 0.757 0.924 0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.504 0.758 0.835 0.839 0.956 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4802)	p
(Intercept)	9.88	1.21	[7.51, 12.25]	8.18	< .001
log within	0.04	0.05	[-0.06, 0.13]	0.74	0.459
log between	-0.14	0.38	[-0.88, 0.59]	-0.39	0.700
sex [M]	2.12	0.79	[0.57, 3.66]	2.69	0.007
age	0.08	0.02	[0.03, 0.13]	3.24	0.001
ms	0.12	0.06	[0.01, 0.23]	2.12	0.034

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.38
SD (Residual)	3.43

```
=====
OUTCOME: who5
EXPOSURE: LAN_sunset_20
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-4.2679 -0.6109 0.0360 0.6284 5.0002

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.97 4.239
Residual 12.04 3.469
Number of obs: 5099, groups: id, 168

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.046e+01 1.273e+00 8.219
log_within -1.591e-02 3.725e-02 -0.427
log_between 1.553e-01 4.064e-01 0.382
sexM 2.346e+00 7.531e-01 3.115
age 6.520e-02 2.305e-02 2.829
wakeupTime_dec -4.395e-06 4.317e-02 0.000

Correlation of Fixed Effects:
(Intr) lg_wth lg_btw sexM age
log_within -0.012
log_between -0.611 0.000
sexM -0.137 -0.001 0.010
age -0.715 0.002 0.087 -0.052
wakeupTm_dc -0.338 0.037 0.010 -0.021 0.067

Robustness weights for the residuals:
3967 weights are ~= 1. The remaining 1132 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.269 0.626 0.790 0.759 0.929 0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.481 0.760 0.851 0.836 0.948 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(5092)	p
(Intercept)	10.46	1.27	[7.97, 12.96]	8.22	< .001
log within	-0.02	0.04	[-0.09, 0.06]	-0.43	0.669
log between	0.16	0.41	[-0.64, 0.95]	0.38	0.702
sex [M]	2.35	0.75	[0.87, 3.82]	3.11	0.002
age	0.07	0.02	[0.02, 0.11]	2.83	0.005
wakeupTime dec	-4.40e-06	0.04	[-0.08, 0.08]	-1.02e-04	> .999

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.24
SD (Residual)	3.47

```

=====
OUTCOME: who5
EXPOSURE: LAN_0_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4140 -0.6051  0.0381  0.6058  3.8913

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.93     4.235
Residual                12.52     3.538
Number of obs: 5657, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.13303    1.04944   5.844
log_within     -0.02465    0.02624  -0.940
log_between    -0.59790    0.22204  -2.693
sexM            2.28387    0.75344   3.031
age             0.08433    0.02287   3.688
wakeupTime_dec  0.33110    0.04215   7.856

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.080
log_between    0.317  0.021
sexM          -0.217  0.000 -0.169
age           -0.759 -0.010  0.109 -0.061
wakeupTm_dc -0.424 -0.189 -0.112  0.002  0.051

Robustness weights for the residuals:
4424 weights are ~= 1. The remaining 1233 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.305  0.621  0.769  0.753  0.906  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.476  0.729  0.853  0.833  0.969  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5650) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.13 | 1.05 | [ 4.08, 8.19] | 5.84 | < .001
log within | -0.02 | 0.03 | [-0.08, 0.03] | -0.94 | 0.347
log between | -0.60 | 0.22 | [-1.03, -0.16] | -2.69 | 0.007
sex [M] | 2.28 | 0.75 | [ 0.81, 3.76] | 3.03 | 0.002
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.69 | < .001
wakeupTime dec | 0.33 | 0.04 | [ 0.25, 0.41] | 7.86 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.23
SD (Residual) | 3.54

```

```

=====
OUTCOME: who5
EXPOSURE: LAN_1_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3838 -0.6075  0.0376  0.6048  3.9372

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.04     4.248
Residual                   12.51     3.537
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.61562    1.15803   4.849
log_within     -0.06712    0.03312  -2.027
log_between    -0.59437    0.25921  -2.293
sexM            2.14328    0.74843   2.864
age             0.08569    0.02296   3.733
wakeupTime_dec  0.33035    0.04192   7.880

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.064
log_between    0.509  0.016
sexM          -0.201  0.001 -0.099
age           -0.661 -0.008  0.118 -0.054
wakeupTm_dc -0.401 -0.160 -0.099 -0.008  0.051

Robustness weights for the residuals:
4428 weights are ~= 1. The remaining 1233 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.307  0.624  0.772  0.753  0.909  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.495  0.755  0.861  0.837  0.955  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.62 | 1.16 | [ 3.35, 7.89] | 4.85 | < .001
log within | -0.07 | 0.03 | [-0.13, 0.00] | -2.03 | 0.043
log between | -0.59 | 0.26 | [-1.10, -0.09] | -2.29 | 0.022
sex [M] | 2.14 | 0.75 | [ 0.68, 3.61] | 2.86 | 0.004
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.73 | < .001
wakeupTime dec | 0.33 | 0.04 | [ 0.25, 0.41] | 7.88 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.25
SD (Residual) | 3.54

```

```

=====
OUTCOME: who5
EXPOSURE: LAN_2_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4249 -0.6043  0.0372  0.6015  3.8926

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.67     4.321
Residual                12.51     3.537
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    6.00120    1.30483   4.599
log_within    -0.05172    0.04271  -1.211
log_between   -0.36999    0.30510  -1.213
sexM           1.92391    0.75718   2.541
age            0.08866    0.02327   3.810
wakeupTime_dec 0.32731    0.04215   7.765

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.068
log_between   0.631  0.016
sexM          -0.132  0.003  0.007
age           -0.594 -0.010  0.091 -0.042
wakeupTm_dc -0.370 -0.184 -0.089 -0.018  0.054

Robustness weights for the residuals:
4430 weights are ~= 1. The remaining 1231 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.304  0.627  0.773  0.753  0.904  0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.514  0.765  0.832  0.827  0.948  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 6.00 | 1.30 | [ 3.44, 8.56] | 4.60 | < .001
log within | -0.05 | 0.04 | [-0.14, 0.03] | -1.21 | 0.226
log between | -0.37 | 0.31 | [-0.97, 0.23] | -1.21 | 0.225
sex [M] | 1.92 | 0.76 | [ 0.44, 3.41] | 2.54 | 0.011
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.81 | < .001
wakeupTime dec | 0.33 | 0.04 | [ 0.24, 0.41] | 7.77 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.32
SD (Residual) | 3.54

```

```

=====
OUTCOME: who5
EXPOSURE: LAN_3_4
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4336 -0.6052  0.0408  0.6006  3.9508

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.58     4.311
Residual                   12.52     3.539
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.38849    1.60692    2.731
log_within    -0.08712    0.05187   -1.680
log_between   -0.83608    0.41258   -2.026
sexM           1.78592    0.75773    2.357
age            0.08906    0.02317    3.844
wakeupTime_dec 0.33240    0.04223    7.872

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.049
log_between   0.778  0.010
sexM          -0.050  0.004  0.077
age           -0.483 -0.009  0.060 -0.038
wakeupTm_dc -0.308 -0.158 -0.066 -0.023  0.059

Robustness weights for the residuals:
4426 weights are ~= 1. The remaining 1235 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.303  0.625   0.772   0.754  0.909   0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.518  0.779   0.865   0.841  0.944   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.39 | 1.61 | [ 1.24, 7.54] | 2.73 | 0.006
log within | -0.09 | 0.05 | [-0.19, 0.01] | -1.68 | 0.093
log between | -0.84 | 0.41 | [-1.64, -0.03] | -2.03 | 0.043
sex [M] | 1.79 | 0.76 | [ 0.30, 3.27] | 2.36 | 0.018
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.84 | < .001
wakeupTime dec | 0.33 | 0.04 | [ 0.25, 0.42] | 7.87 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.31
SD (Residual) | 3.54

```



```

=====
OUTCOME: who5
EXPOSURE: LAN_4_5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4208 -0.6108  0.0396  0.6086  3.8418

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.53     4.305
Residual                12.61     3.551
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    5.22793    1.84552   2.833
log_within    -0.11713    0.06389  -1.833
log_between   -0.55057    0.47149  -1.168
sexM           1.75496    0.76287   2.300
age            0.09055    0.02311   3.919
wakeupTime_dec 0.32973    0.04190   7.869

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.025
log_between    0.837  0.004
sexM           0.028  0.002  0.147
age           -0.482 -0.006 -0.025 -0.046
wakeupTm_dc -0.252 -0.100 -0.035 -0.022  0.064

Robustness weights for the residuals:
4430 weights are ~= 1. The remaining 1231 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.304  0.621  0.770  0.754  0.907  0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.505  0.770  0.856  0.834  0.956  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 5.23 | 1.85 | [ 1.61, 8.85] | 2.83 | 0.005
log within | -0.12 | 0.06 | [-0.24, 0.01] | -1.83 | 0.067
log between | -0.55 | 0.47 | [-1.47, 0.37] | -1.17 | 0.243
sex [M] | 1.75 | 0.76 | [ 0.26, 3.25] | 2.30 | 0.021
age | 0.09 | 0.02 | [ 0.05, 0.14] | 3.92 | < .001
wakeupTime dec | 0.33 | 0.04 | [ 0.25, 0.41] | 7.87 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.31
SD (Residual) | 3.55

```

```

=====
OUTCOME: who5
EXPOSURE: LAN_5_sunrise
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4289 -0.6091  0.0405  0.5997  3.9105

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.28     4.275
Residual                   12.45     3.529
Number of obs: 5661, groups: id, 172

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.98600    2.18240   1.826
log_within    -0.06022    0.07140  -0.843
log_between   -0.94185    0.58364  -1.614
sexM           1.58821    0.77063   2.061
age            0.09506    0.02310   4.115
wakeupTime_dec 0.31228    0.04136   7.550

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.001
log_between    0.889  0.000
sexM           0.129  0.000  0.233
age           -0.488 -0.001 -0.117 -0.069
wakeupTm_dc -0.166 -0.008  0.022 -0.012  0.060

Robustness weights for the residuals:
4432 weights are ~= 1. The remaining 1229 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.304  0.622  0.770  0.751  0.905  0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.500  0.749  0.842  0.825  0.927  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(5654) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.99 | 2.18 | [-0.29, 8.26] | 1.83 | 0.068
log within | -0.06 | 0.07 | [-0.20, 0.08] | -0.84 | 0.399
log between | -0.94 | 0.58 | [-2.09, 0.20] | -1.61 | 0.107
sex [M] | 1.59 | 0.77 | [ 0.08, 3.10] | 2.06 | 0.039
age | 0.10 | 0.02 | [ 0.05, 0.14] | 4.12 | < .001
wakeupTime dec | 0.31 | 0.04 | [ 0.23, 0.39] | 7.55 | < .001

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.28
SD (Residual) | 3.53

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_0.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3719 -0.6026  0.0242  0.6026  4.0399

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.42     4.292
Residual                   12.55     3.542
Number of obs: 4982, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.92820    1.01249   9.806
log_within    0.02693    0.02136   1.261
log_between   0.02452    0.20700   0.118
sexM          1.91412    0.75727   2.528
age           0.08087    0.02368   3.415
ms            0.06688    0.05761   1.161

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.032
log_between -0.224  0.001
sexM        -0.161  0.003 -0.027
age         -0.865 -0.006  0.123 -0.054
ms          -0.330 -0.099 -0.011 -0.031  0.069

Robustness weights for the residuals:
3883 weights are ~= 1. The remaining 1099 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.308  0.619  0.773  0.756  0.916  0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.492  0.760  0.828  0.823  0.951  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4975) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.93 | 1.01 | [ 7.94, 11.91] | 9.81 | < .001
log within | 0.03 | 0.02 | [-0.01, 0.07] | 1.26 | 0.207
log between | 0.02 | 0.21 | [-0.38, 0.43] | 0.12 | 0.906
sex [M] | 1.91 | 0.76 | [ 0.43, 3.40] | 2.53 | 0.012
age | 0.08 | 0.02 | [ 0.03, 0.13] | 3.42 | < .001
ms | 0.07 | 0.06 | [-0.05, 0.18] | 1.16 | 0.246

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.29
SD (Residual) | 3.54

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_1.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3542 -0.6061  0.0251  0.6011  4.0202

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.22     4.269
Residual                   12.65     3.557
Number of obs: 4975, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.66394    1.17356   8.235
log_within    0.06068    0.02421   2.507
log_between   0.14917    0.23181   0.643
sexM          1.95823    0.75322   2.600
age           0.08125    0.02353   3.452
ms            0.04703    0.05762   0.816

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.018
log_between -0.547 -0.001
sexM        -0.140  0.002 -0.007
age         -0.782 -0.004  0.114 -0.052
ms          -0.290 -0.064  0.006 -0.032  0.072

Robustness weights for the residuals:
3882 weights are ~= 1. The remaining 1093 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.309  0.618  0.776  0.756  0.916  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.503  0.752  0.862  0.833  0.958  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4968) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.66 | 1.17 | [ 7.36, 11.96] | 8.23 | < .001
log within | 0.06 | 0.02 | [ 0.01, 0.11] | 2.51 | 0.012
log between | 0.15 | 0.23 | [-0.31, 0.60] | 0.64 | 0.520
sex [M] | 1.96 | 0.75 | [ 0.48, 3.43] | 2.60 | 0.009
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.45 | < .001
ms | 0.05 | 0.06 | [-0.07, 0.16] | 0.82 | 0.414

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.27
SD (Residual) | 3.56

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_1
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3569 -0.6026  0.0283  0.6012  4.0241

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.42     4.291
Residual                   12.57     3.546
Number of obs: 4980, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.43839    1.09439   8.624
log_within    0.02629    0.02237   1.175
log_between   0.21279    0.21350   0.997
sexM          1.92307    0.75697   2.540
age           0.08406    0.02375   3.539
ms            0.07366    0.05764   1.278

Correlation of Fixed Effects:
              (Intr) lg_wth lg_btw sexM   age
log_within    0.028
log_between  -0.432  0.000
sexM          -0.154  0.003 -0.001
age          -0.836 -0.006  0.146 -0.051
ms           -0.307 -0.094 -0.001 -0.032  0.071

Robustness weights for the residuals:
3875 weights are ~= 1. The remaining 1105 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.309  0.619  0.772  0.757  0.919  0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.500  0.761  0.843  0.821  0.936  0.988

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4973) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.44 | 1.09 | [ 7.29, 11.58] | 8.62 | < .001
log within | 0.03 | 0.02 | [-0.02, 0.07] | 1.17 | 0.240
log between | 0.21 | 0.21 | [-0.21, 0.63] | 1.00 | 0.319
sex [M] | 1.92 | 0.76 | [ 0.44, 3.41] | 2.54 | 0.011
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.54 | < .001
ms | 0.07 | 0.06 | [-0.04, 0.19] | 1.28 | 0.201

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.29
SD (Residual) | 3.55

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_2.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3788 -0.6059  0.0328  0.6001  4.0241

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.15     4.260
Residual                12.55     3.542
Number of obs: 4954, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  9.51958    1.34222   7.092
log_within   0.12694    0.02835   4.478
log_between  0.18915    0.27049   0.699
sexM         1.96233    0.75181   2.610
age          0.08130    0.02340   3.475
ms           0.02185    0.05829   0.375

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.016
log_between -0.682 -0.001
sexM        -0.113  0.002 -0.018
age         -0.680 -0.004  0.072 -0.052
ms          -0.262 -0.064  0.014 -0.033  0.072

Robustness weights for the residuals:
3875 weights are ~= 1. The remaining 1079 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.307  0.615   0.772   0.751  0.915   0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.506  0.757   0.859   0.839  0.958   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4947) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.52 | 1.34 | [ 6.89, 12.15] | 7.09 | < .001
log within | 0.13 | 0.03 | [ 0.07, 0.18] | 4.48 | < .001
log between | 0.19 | 0.27 | [-0.34, 0.72] | 0.70 | 0.484
sex [M] | 1.96 | 0.75 | [ 0.49, 3.44] | 2.61 | 0.009
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.47 | < .001
ms | 0.02 | 0.06 | [-0.09, 0.14] | 0.37 | 0.708

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.26
SD (Residual) | 3.54

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_2
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3611 -0.5974  0.0301  0.6030  4.0168

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.25     4.272
Residual                   12.65     3.557
Number of obs: 4961, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  9.89953    1.24611    7.944
log_within   0.09667    0.02606    3.710
log_between  0.07719    0.24399    0.316
sexM         1.91894    0.75411    2.545
age          0.08041    0.02352    3.419
ms           0.03672    0.05806    0.632

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.015
log_between -0.614 -0.001
sexM        -0.120  0.002 -0.024
age         -0.741 -0.003  0.100 -0.054
ms          -0.278 -0.058  0.012 -0.033  0.072

Robustness weights for the residuals:
3876 weights are ~= 1. The remaining 1085 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.308  0.616  0.775  0.754  0.919  0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.493  0.761  0.836  0.827  0.953  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4954) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.90 | 1.25 | [ 7.46, 12.34] | 7.94 | < .001
log within | 0.10 | 0.03 | [ 0.05, 0.15] | 3.71 | < .001
log between | 0.08 | 0.24 | [-0.40, 0.56] | 0.32 | 0.752
sex [M] | 1.92 | 0.75 | [ 0.44, 3.40] | 2.54 | 0.011
age | 0.08 | 0.02 | [ 0.03, 0.13] | 3.42 | < .001
ms | 0.04 | 0.06 | [-0.08, 0.15] | 0.63 | 0.527

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.27
SD (Residual) | 3.56

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_3.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3850 -0.6020  0.0363  0.6037  4.0124

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.18     4.264
Residual                12.46     3.529
Number of obs: 4934, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  9.22442    1.46823    6.283
log_within   0.16063    0.03324    4.832
log_between  0.20882    0.29952    0.697
sexM         1.96216    0.75289    2.606
age          0.08169    0.02337    3.496
ms           0.05018    0.05937    0.845

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.013
log_between -0.742 -0.002
sexM        -0.088  0.002 -0.036
age         -0.599 -0.003  0.027 -0.052
ms          -0.253 -0.053  0.026 -0.034  0.072

Robustness weights for the residuals:
3859 weights are ~= 1. The remaining 1075 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.307  0.615   0.770   0.751  0.911   0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.508  0.752   0.844   0.831  0.955   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4927) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.22 | 1.47 | [ 6.35, 12.10] | 6.28 | < .001
log within | 0.16 | 0.03 | [ 0.10, 0.23] | 4.83 | < .001
log between | 0.21 | 0.30 | [-0.38, 0.80] | 0.70 | 0.486
sex [M] | 1.96 | 0.75 | [ 0.49, 3.44] | 2.61 | 0.009
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.50 | < .001
ms | 0.05 | 0.06 | [-0.07, 0.17] | 0.85 | 0.398

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.26
SD (Residual) | 3.53

```



```

=====
OUTCOME: who5
EXPOSURE: LaW_3
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.3777 -0.6039  0.0350  0.6015  4.0270

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.15     4.261
Residual                12.49     3.534
Number of obs: 4946, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.42958    1.40567   6.708
log_within    0.15246    0.03071   4.965
log_between   0.20417    0.28423   0.718
sexM          1.96767    0.75214   2.616
age           0.08148    0.02337   3.486
ms            0.01793    0.05843   0.307

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.015
log_between -0.716 -0.001
sexM        -0.097  0.002 -0.031
age         -0.641 -0.003  0.053 -0.053
ms          -0.255 -0.061  0.019 -0.034  0.072

Robustness weights for the residuals:
3868 weights are ~= 1. The remaining 1078 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.307  0.616  0.771  0.752  0.915  0.999

Robustness weights for the random effects:
140 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.507  0.759  0.854  0.839  0.963  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4939) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.43 | 1.41 | [ 6.67, 12.19] | 6.71 | < .001
log within | 0.15 | 0.03 | [ 0.09, 0.21] | 4.96 | < .001
log between | 0.20 | 0.28 | [-0.35, 0.76] | 0.72 | 0.473
sex [M] | 1.97 | 0.75 | [ 0.49, 3.44] | 2.62 | 0.009
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.49 | < .001
ms | 0.02 | 0.06 | [-0.10, 0.13] | 0.31 | 0.759

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.26
SD (Residual) | 3.53

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_4.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4159 -0.6045  0.0415  0.5989  4.0259

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.75     4.213
Residual                12.28     3.504
Number of obs: 4877, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.28201    1.55421   5.972
log_within    0.21944    0.03723   5.894
log_between   0.21407    0.32244   0.664
sexM          1.97949    0.74421   2.660
age           0.07884    0.02310   3.413
ms            0.04496    0.06132   0.733

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.010
log_between -0.778 -0.001
sexM        -0.089  0.002 -0.021
age         -0.519 -0.002 -0.028 -0.051
ms          -0.252 -0.040  0.036 -0.038  0.069

Robustness weights for the residuals:
3818 weights are ~= 1. The remaining 1059 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.305  0.610  0.767  0.748  0.912  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.497  0.742  0.834  0.830  0.951  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4870) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.28 | 1.55 | [ 6.24, 12.33] | 5.97 | < .001
log within | 0.22 | 0.04 | [ 0.15, 0.29] | 5.89 | < .001
log between | 0.21 | 0.32 | [-0.42, 0.85] | 0.66 | 0.507
sex [M] | 1.98 | 0.74 | [ 0.52, 3.44] | 2.66 | 0.008
age | 0.08 | 0.02 | [ 0.03, 0.12] | 3.41 | < .001
ms | 0.04 | 0.06 | [-0.08, 0.17] | 0.73 | 0.463

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.21
SD (Residual) | 3.50

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_4
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4172 -0.6043  0.0407  0.6009  4.0060

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.88     4.229
Residual                12.35     3.514
Number of obs: 4906, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  9.28435    1.51754   6.118
log_within   0.19781    0.03548   5.575
log_between  0.18943    0.31207   0.607
sexM         1.93940    0.74682   2.597
age          0.07988    0.02317   3.447
ms           0.06183    0.06033   1.025

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.012
log_between -0.765 -0.001
sexM        -0.090  0.002 -0.025
age         -0.558 -0.003  0.002 -0.051
ms          -0.249 -0.049  0.030 -0.037  0.070

Robustness weights for the residuals:
3836 weights are ~= 1. The remaining 1070 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.304  0.612  0.764  0.750  0.912  0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.499  0.740  0.829  0.825  0.943  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4899) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.28 | 1.52 | [ 6.31, 12.26] | 6.12 | < .001
log within | 0.20 | 0.04 | [ 0.13, 0.27] | 5.58 | < .001
log between | 0.19 | 0.31 | [-0.42, 0.80] | 0.61 | 0.544
sex [M] | 1.94 | 0.75 | [ 0.48, 3.40] | 2.60 | 0.009
age | 0.08 | 0.02 | [ 0.03, 0.13] | 3.45 | < .001
ms | 0.06 | 0.06 | [-0.06, 0.18] | 1.02 | 0.305

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.23
SD (Residual) | 3.51

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_5.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4028 -0.6043  0.0400  0.6049  4.0098

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      17.77    4.215
Residual                12.25    3.501
Number of obs: 4761, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  8.89877    1.65626   5.373
log_within   0.24824    0.04175   5.945
log_between  0.28293    0.34383   0.823
sexM         1.95431    0.74578   2.620
age          0.07967    0.02315   3.442
ms           0.04851    0.06524   0.744

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.001
log_between -0.805  0.000
sexM        -0.101  0.000  0.002
age         -0.477  0.000 -0.039 -0.050
ms          -0.254 -0.006  0.044 -0.037  0.068

Robustness weights for the residuals:
3719 weights are ~= 1. The remaining 1042 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.305  0.616  0.768  0.753  0.918  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.504  0.746  0.841  0.832  0.954  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4754) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 8.90 | 1.66 | [ 5.65, 12.15] | 5.37 | < .001
log within | 0.25 | 0.04 | [ 0.17, 0.33] | 5.95 | < .001
log between | 0.28 | 0.34 | [-0.39, 0.96] | 0.82 | 0.411
sex [M] | 1.95 | 0.75 | [ 0.49, 3.42] | 2.62 | 0.009
age | 0.08 | 0.02 | [ 0.03, 0.13] | 3.44 | < .001
ms | 0.05 | 0.07 | [-0.08, 0.18] | 0.74 | 0.457

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.22
SD (Residual) | 3.50

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4030 -0.6050  0.0388  0.5975  3.8459

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.69      4.206
Residual                   12.31      3.509
Number of obs: 4823, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.11714    1.59034   5.733
log_within    0.23463    0.03980   5.895
log_between   0.24256    0.33030   0.734
sexM          1.96225    0.74317   2.640
age           0.07954    0.02308   3.446
ms            0.04541    0.06318   0.719

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.005
log_between -0.788 -0.001
sexM        -0.089  0.001 -0.018
age         -0.494 -0.001 -0.043 -0.050
ms          -0.255 -0.022  0.039 -0.038  0.070

Robustness weights for the residuals:
3767 weights are ~= 1. The remaining 1056 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.305  0.613   0.769   0.752  0.918   0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.499  0.738   0.832   0.823  0.937   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4816) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.12 | 1.59 | [ 6.00, 12.23] | 5.73 | < .001
log within | 0.23 | 0.04 | [ 0.16, 0.31] | 5.89 | < .001
log between | 0.24 | 0.33 | [-0.40, 0.89] | 0.73 | 0.463
sex [M] | 1.96 | 0.74 | [ 0.51, 3.42] | 2.64 | 0.008
age | 0.08 | 0.02 | [ 0.03, 0.12] | 3.45 | < .001
ms | 0.05 | 0.06 | [-0.08, 0.17] | 0.72 | 0.472

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.21
SD (Residual) | 3.51

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_6.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4185 -0.6041  0.0408  0.5967  4.2213

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.36      4.284
Residual                12.01      3.465
Number of obs: 4580, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.14139    1.64374   5.561
log_within    0.28018    0.04633   6.048
log_between   0.22532    0.33189   0.679
sexM          2.04630    0.75937   2.695
age           0.08033    0.02354   3.413
ms            0.02871    0.07040   0.408

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.007
log_between -0.792  0.001
sexM        -0.131 -0.001  0.037
age         -0.481  0.002 -0.051 -0.052
ms          -0.263  0.027  0.042 -0.037  0.062

Robustness weights for the residuals:
3584 weights are ~= 1. The remaining 996 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.304  0.610  0.770  0.749  0.908  0.999

Robustness weights for the random effects:
141 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.506  0.748  0.833  0.839  0.964  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4573) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.14 | 1.64 | [ 5.92, 12.36] | 5.56 | < .001
log within | 0.28 | 0.05 | [ 0.19, 0.37] | 6.05 | < .001
log between | 0.23 | 0.33 | [-0.43, 0.88] | 0.68 | 0.497
sex [M] | 2.05 | 0.76 | [ 0.56, 3.54] | 2.69 | 0.007
age | 0.08 | 0.02 | [ 0.03, 0.13] | 3.41 | < .001
ms | 0.03 | 0.07 | [-0.11, 0.17] | 0.41 | 0.683

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.28
SD (Residual) | 3.47

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_6
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4275 -0.6079  0.0376  0.5984  4.1463

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.93     4.234
Residual                12.08     3.476
Number of obs: 4678, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)  9.35779    1.61535   5.793
log_within   0.29206    0.04369   6.685
log_between  0.16501    0.32696   0.505
sexM         2.04887    0.74984   2.732
age          0.08017    0.02326   3.447
ms           0.04075    0.06756   0.603

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.001
log_between -0.790  0.000
sexM        -0.117  0.000  0.018
age         -0.491  0.000 -0.042 -0.051
ms          -0.264  0.002  0.045 -0.037  0.065

Robustness weights for the residuals:
3661 weights are ~= 1. The remaining 1017 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.304  0.607   0.767   0.748  0.907   0.999

Robustness weights for the random effects:
142 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.497  0.751   0.802   0.829  0.965   0.994

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4671) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.36 | 1.62 | [ 6.19, 12.52] | 5.79 | < .001
log within | 0.29 | 0.04 | [ 0.21, 0.38] | 6.68 | < .001
log between | 0.17 | 0.33 | [-0.48, 0.81] | 0.50 | 0.614
sex [M] | 2.05 | 0.75 | [ 0.58, 3.52] | 2.73 | 0.006
age | 0.08 | 0.02 | [ 0.03, 0.13] | 3.45 | < .001
ms | 0.04 | 0.07 | [-0.09, 0.17] | 0.60 | 0.546

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.23
SD (Residual) | 3.48

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_7.5
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.1941 -0.6058  0.0444  0.5983  4.2803

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.16     4.261
Residual                   11.67     3.416
Number of obs: 4197, groups: id, 170

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.27220    1.68874   5.491
log_within    0.24378    0.05070   4.808
log_between   0.12648    0.33910   0.373
sexM          1.97563    0.76083   2.597
age           0.08602    0.02348   3.663
ms            0.03891    0.07924   0.491

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within -0.009
log_between -0.799  0.001
sexM        -0.122 -0.001  0.032
age         -0.473  0.002 -0.043 -0.054
ms          -0.272  0.030  0.040 -0.039  0.057

Robustness weights for the residuals:
3285 weights are ~= 1. The remaining 912 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.314  0.605   0.765   0.748  0.912   0.999

Robustness weights for the random effects:
139 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.500  0.770   0.849   0.846  0.967   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4190) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.27 | 1.69 | [ 5.96, 12.58] | 5.49 | < .001
log within | 0.24 | 0.05 | [ 0.14, 0.34] | 4.81 | < .001
log between | 0.13 | 0.34 | [-0.54, 0.79] | 0.37 | 0.709
sex [M] | 1.98 | 0.76 | [ 0.48, 3.47] | 2.60 | 0.009
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.66 | < .001
ms | 0.04 | 0.08 | [-0.12, 0.19] | 0.49 | 0.623

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.26
SD (Residual) | 3.42

```



```

=====
OUTCOME: who5
EXPOSURE: LaW_7
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.1690 -0.6010  0.0429  0.5970  4.3962

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.13     4.258
Residual                   11.81     3.437
Number of obs: 4426, groups: id, 171

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.17793    1.65663    5.540
log_within    0.28126    0.04850    5.799
log_between   0.13156    0.33241    0.396
sexM          1.90965    0.75783    2.520
age           0.08366    0.02343    3.571
ms            0.07914    0.07375    1.073

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.007
log_between -0.795  0.001
sexM        -0.129 -0.001  0.038
age         -0.478  0.002 -0.046 -0.054
ms          -0.263  0.024  0.039 -0.037  0.058

Robustness weights for the residuals:
3469 weights are ~= 1. The remaining 957 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.306  0.605   0.768   0.746  0.904   0.999

Robustness weights for the random effects:
143 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.500  0.739   0.791   0.822  0.962   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4419) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.18 | 1.66 | [ 5.93, 12.43] | 5.54 | < .001
log within | 0.28 | 0.05 | [ 0.19, 0.38] | 5.80 | < .001
log between | 0.13 | 0.33 | [-0.52, 0.78] | 0.40 | 0.692
sex [M] | 1.91 | 0.76 | [ 0.42, 3.40] | 2.52 | 0.012
age | 0.08 | 0.02 | [ 0.04, 0.13] | 3.57 | < .001
ms | 0.08 | 0.07 | [-0.07, 0.22] | 1.07 | 0.283

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.26
SD (Residual) | 3.44

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_8
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.1969 -0.6006  0.0432  0.5815  4.2661

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.67      4.204
Residual                   11.69      3.418
Number of obs: 3836, groups: id, 166

Fixed effects:
              Estimate Std. Error t value
(Intercept)   9.09494    1.65821    5.485
log_within    0.25380    0.05467    4.642
log_between   0.23974    0.33058    0.725
sexM          2.07604    0.76363    2.719
age           0.08692    0.02332    3.726
ms           -0.03576    0.08835   -0.405

Correlation of Fixed Effects:
      (Intr) lg_wth lg_btw sexM   age
log_within -0.013
log_between -0.787  0.002
sexM        -0.129 -0.002  0.047
age         -0.477  0.003 -0.048 -0.065
ms          -0.293  0.044  0.039 -0.034  0.055

Robustness weights for the residuals:
2990 weights are ~= 1. The remaining 846 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.315  0.613   0.769   0.752  0.919   0.999

Robustness weights for the random effects:
137 weights are ~= 1. The remaining 29 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    0.497  0.749   0.875   0.839  0.953   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(3829) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 9.09 | 1.66 | [ 5.84, 12.35] | 5.48 | < .001
log within | 0.25 | 0.05 | [ 0.15, 0.36] | 4.64 | < .001
log between | 0.24 | 0.33 | [-0.41, 0.89] | 0.73 | 0.468
sex [M] | 2.08 | 0.76 | [ 0.58, 3.57] | 2.72 | 0.007
age | 0.09 | 0.02 | [ 0.04, 0.13] | 3.73 | < .001
ms | -0.04 | 0.09 | [-0.21, 0.14] | -0.40 | 0.686

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.20
SD (Residual) | 3.42

```

```

=====
OUTCOME: who5
EXPOSURE: LaW_sunset
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_log
Data: data
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.4292 -0.6251  0.0575  0.5959  4.2572

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.5      4.184
Residual                11.3      3.362
Number of obs: 4069, groups: id, 168

Fixed effects:
              Estimate Std. Error t value
(Intercept)   8.00448    1.64212   4.874
log_within    0.37277    0.05563   6.701
log_between   0.38555    0.33351   1.156
sexM          2.10928    0.75218   2.804
age           0.09023    0.02284   3.950
ms            0.02417    0.08057   0.300

Correlation of Fixed Effects:
          (Intr) lg_wth lg_btw sexM   age
log_within  0.005
log_between -0.796  0.000
sexM        -0.108  0.001  0.009
age         -0.503 -0.001 -0.015 -0.051
ms          -0.252 -0.022  0.029 -0.039  0.058

Robustness weights for the residuals:
3199 weights are ~= 1. The remaining 870 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.304  0.613   0.760   0.744  0.902   0.999

Robustness weights for the random effects:
138 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.518  0.758   0.878   0.843  0.947   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4062) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 8.00 | 1.64 | [ 4.79, 11.22] | 4.87 | < .001
log within | 0.37 | 0.06 | [ 0.26, 0.48] | 6.70 | < .001
log between | 0.39 | 0.33 | [-0.27, 1.04] | 1.16 | 0.248
sex [M] | 2.11 | 0.75 | [ 0.63, 3.58] | 2.80 | 0.005
age | 0.09 | 0.02 | [ 0.05, 0.14] | 3.95 | < .001
ms | 0.02 | 0.08 | [-0.13, 0.18] | 0.30 | 0.764

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.18
SD (Residual) | 3.36

```

```
=====
OUTCOME: anxiety
EXPOSURE: fffreq_1 | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.6539 -0.5586 -0.0495 0.5732 6.9148

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8340 1.6834
Residual 0.3805 0.6168
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.008672 0.676328 5.927
sexM -0.271417 0.305645 -0.888
age -0.040202 0.010010 -4.016
ms -0.031280 0.024054 -1.300
ra_sum_250vs1_7d -0.179691 0.072454 -2.480
fffreq_1_0min_wth 0.007395 0.009391 0.787
fffreq_1_0min_btw 0.033416 0.096104 0.348

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_0mn_w
sexM -0.098
age -0.759 -0.072
ms_expsc_nt -0.188 -0.044 0.072
r_sm_250l_7 -0.066 -0.005 0.001 0.076
fffrq_1_0mn_w 0.041 0.010 -0.006 -0.151 -0.311
fffrq_1_0mn_b -0.805 0.019 0.353 -0.029 -0.046 0.021

Robustness weights for the residuals:
3362 weights are ~= 1. The remaining 990 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.195 0.546 0.719 0.701 0.883 0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.381 0.654 0.826 0.781 0.901 0.988

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	4.01	0.68	[2.68, 5.33]	5.93	< .001
sex [M]	-0.27	0.31	[-0.87, 0.33]	-0.89	0.375
age	-0.04	0.01	[-0.06, -0.02]	-4.02	< .001
ms	-0.03	0.02	[-0.08, 0.02]	-1.30	0.194
ra_sum_250vs1_7d	-0.18	0.07	[-0.32, -0.04]	-2.48	0.013
fffreq_1_0min_wth	7.39e-03	9.39e-03	[-0.01, 0.03]	0.79	0.431
fffreq_1_0min_btw	0.03	0.10	[-0.15, 0.22]	0.35	0.728

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.68
SD (Residual)	0.62

```

=====
OUTCOME: anxiety
EXPOSURE: fffreq_1 | 15 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.6960 -0.5629 -0.0497  0.5695  6.8496

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.8158   1.6780
Residual                   0.3811   0.6173
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.98286    0.40041   9.947
sexM            -0.28995    0.30498  -0.951
age             -0.04583    0.01015  -4.515
ms             -0.02151    0.02391  -0.900
ra_sum_250vs1_7d -0.09085    0.07586  -1.198
fffreq_1_15min_wth 0.02884    0.01314   2.195
fffreq_1_15min_btw 0.27025    0.15038   1.797

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 fffrq_1_15mn_w
sexM          -0.140
age           -0.779 -0.058
ms_expsc_nt   -0.356 -0.045  0.073
r_sm_250l_7    -0.179 -0.006 -0.007  0.070
fffrq_1_15mn_w -0.099 -0.007  0.002  0.099  0.417
fffrq_1_15mn_b -0.019 -0.049 -0.392  0.021  0.060  0.025

Robustness weights for the residuals:
3367 weights are ~= 1. The remaining 985 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.196  0.546   0.718   0.701  0.882   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.397  0.705   0.869   0.804  0.929   0.993

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.98 | 0.40 | [ 3.20, 4.77] | 9.95 | < .001
sex [M] | -0.29 | 0.30 | [-0.89, 0.31] | -0.95 | 0.342
age | -0.05 | 0.01 | [-0.07, -0.03] | -4.52 | < .001
ms | -0.02 | 0.02 | [-0.07, 0.03] | -0.90 | 0.368
ra_sum_250vs1_7d | -0.09 | 0.08 | [-0.24, 0.06] | -1.20 | 0.231
fffreq_1_15min_wth | 0.03 | 0.01 | [ 0.00, 0.05] | 2.20 | 0.028
fffreq_1_15min_btw | 0.27 | 0.15 | [-0.02, 0.57] | 1.80 | 0.072

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.68
SD (Residual) | 0.62

```

```

=====
OUTCOME: anxiety
EXPOSURE: fffreq_1 | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.7317 -0.5569 -0.0432  0.5668  6.9095

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.6692   1.6338
Residual                   0.3802   0.6166
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.12257    0.39398  10.464
sexM            -0.25088    0.29665  -0.846
age             -0.05078    0.01003  -5.062
ms              -0.02169    0.02384  -0.910
ra_sum_250vs1_7d -0.09500    0.07608  -1.249
fffreq_1_30min_wth 0.03320    0.01808   1.836
fffreq_1_30min_btw 0.60088    0.20664   2.908

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 fffrq_1_30mn_w
sexM          -0.138
age           -0.817 -0.077
ms_expsc_nt   -0.359 -0.044  0.076
r_sm_250l_7   -0.174 -0.003 -0.011  0.070
fffreq_1_30mn_w -0.098 -0.005  0.000  0.098  0.425
fffreq_1_30mn_b 0.116  0.003 -0.422  0.013  0.066  0.025

Robustness weights for the residuals:
3358 weights are ~= 1. The remaining 994 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.195  0.546   0.719   0.702  0.885   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.398  0.682   0.847   0.792  0.935   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.12 | 0.39 | [ 3.35, 4.89] | 10.46 | < .001
sex [M] | -0.25 | 0.30 | [-0.83, 0.33] | -0.85 | 0.398
age | -0.05 | 0.01 | [-0.07, -0.03] | -5.06 | < .001
ms | -0.02 | 0.02 | [-0.07, 0.03] | -0.91 | 0.363
ra_sum_250vs1_7d | -0.09 | 0.08 | [-0.24, 0.05] | -1.25 | 0.212
fffreq_1_30min_wth | 0.03 | 0.02 | [ 0.00, 0.07] | 1.84 | 0.066
fffreq_1_30min_btw | 0.60 | 0.21 | [ 0.20, 1.01] | 2.91 | 0.004

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.63
SD (Residual) | 0.62

```

```

=====
OUTCOME: anxiety
EXPOSURE: freq_10_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.7388 -0.5569 -0.0526  0.5741  7.0425

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.8356   1.6839
Residual                   0.3791   0.6157
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.108980   0.427322   9.616
sexM            -0.263220   0.307551  -0.856
age            -0.040776   0.009446  -4.317
ms            -0.031273   0.023884  -1.309
ra_sum_250vs10_3h_7d -0.166784   0.054390  -3.066
freq_10_3h_0min_wth -0.004186   0.013335  -0.314
freq_10_3h_0min_btw -0.035143   0.134349  -0.262

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_0mn_w
sexM          -0.090
age          -0.842 -0.097
ms_expsc_nt   -0.306 -0.038  0.079
r__25010_3_    -0.036 -0.004 -0.013  0.100
frq_10_3h_0mn_w  0.016  0.003  0.001 -0.063 -0.185
frq_10_3h_0mn_b -0.378 -0.110  0.128 -0.049 -0.047  0.043

Robustness weights for the residuals:
3366 weights are ~= 1. The remaining 986 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.541  0.718  0.699  0.879  0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.380  0.654  0.816  0.782  0.913  0.995

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.11 | 0.43 | [ 3.27, 4.95] | 9.62 | < .001
sex [M] | -0.26 | 0.31 | [-0.87, 0.34] | -0.86 | 0.392
age | -0.04 | 9.45e-03 | [-0.06, -0.02] | -4.32 | < .001
ms | -0.03 | 0.02 | [-0.08, 0.02] | -1.31 | 0.190
ra_sum_250vs10_3h_7d | -0.17 | 0.05 | [-0.27, -0.06] | -3.07 | 0.002
freq_10_3h_0min_wth | -4.19e-03 | 0.01 | [-0.03, 0.02] | -0.31 | 0.754
freq_10_3h_0min_btw | -0.04 | 0.13 | [-0.30, 0.23] | -0.26 | 0.794

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.68
SD (Residual) | 0.62

```

=====
OUTCOME: anxiety
EXPOSURE: freq_10_3h | 120 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.7329 -0.5611 -0.0525 0.5761 7.0570

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8232 1.6802
Residual 0.3792 0.6158
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.04217 0.39610 10.205
sexM -0.29869 0.30637 -0.975
age -0.04200 0.00946 -4.440
ms -0.03050 0.02388 -1.277
ra_sum_250vs10_3h_7d -0.15957 0.05405 -2.952
freq_10_3h_120min_wth 0.01410 0.01417 0.995
freq_10_3h_120min_btw 0.12039 0.13664 0.881

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_120mn_w
sexM -0.134
age -0.839 -0.068
ms_expsc_nt -0.350 -0.044 0.085
r__25010_3_ -0.060 -0.014 -0.016 0.098
frq_10_3h_120mn_w -0.030 -0.007 0.003 0.077 0.143
frq_10_3h_120mn_b -0.081 -0.094 -0.154 -0.001 0.053 0.000

Robustness weights for the residuals:
3365 weights are ~= 1. The remaining 987 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.191 0.541 0.717 0.699 0.881 0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.376 0.674 0.812 0.777 0.894 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
(Intercept) | 4.04 | 0.40 | [3.27, 4.82] | 10.21 | < .001
sex [M] | -0.30 | 0.31 | [-0.90, 0.30] | -0.97 | 0.330
age | -0.04 | 9.46e-03 | [-0.06, -0.02] | -4.44 | < .001
ms | -0.03 | 0.02 | [-0.08, 0.02] | -1.28 | 0.202
ra_sum_250vs10_3h_7d | -0.16 | 0.05 | [-0.27, -0.05] | -2.95 | 0.003
freq_10_3h_120min_wth | 0.01 | 0.01 | [-0.01, 0.04] | 0.99 | 0.320
freq_10_3h_120min_btw | 0.12 | 0.14 | [-0.15, 0.39] | 0.88 | 0.378

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 1.68
SD (Residual) | 0.62


```

=====
OUTCOME: anxiety
EXPOSURE: freq_10_3h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.7332 -0.5581 -0.0536  0.5786  7.0378

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.8431    1.686
Residual                   0.3794    0.616
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.104784   0.464144   8.844
sexM            -0.267264   0.306144  -0.873
age             -0.040517   0.009416  -4.303
ms             -0.034772   0.024380  -1.426
ra_sum_250vs10_3h_7d -0.179124  0.057715  -3.104
freq_10_3h_30min_wth -0.004068  0.009714  -0.419
freq_10_3h_30min_btw -0.004278  0.071097  -0.060

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_30mn_w
sexM          -0.112
age           -0.690 -0.082
ms_expsc_nt   -0.338 -0.046  0.080
r__25010_3_   -0.112 -0.014 -0.011  0.160
frq_10_3h_30mn_w -0.092 -0.013  0.007  0.205  0.371
frq_10_3h_30mn_b -0.517 -0.018 -0.087  0.063  0.086  0.040

Robustness weights for the residuals:
3369 weights are ~= 1. The remaining 983 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.542   0.719   0.698   0.879   0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.382  0.676   0.823   0.791   0.906   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.10 | 0.46 | [ 3.19, 5.01] | 8.84 | < .001
sex [M] | -0.27 | 0.31 | [-0.87, 0.33] | -0.87 | 0.383
age | -0.04 | 9.42e-03 | [-0.06, -0.02] | -4.30 | < .001
ms | -0.03 | 0.02 | [-0.08, 0.01] | -1.43 | 0.154
ra sum 250vs10 3h 7d | -0.18 | 0.06 | [-0.29, -0.07] | -3.10 | 0.002
freq 10 3h 30min wth | -4.07e-03 | 9.71e-03 | [-0.02, 0.01] | -0.42 | 0.675
freq 10 3h 30min btw | -4.28e-03 | 0.07 | [-0.14, 0.14] | -0.06 | 0.952

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.69
SD (Residual) | 0.62

```

```

=====
OUTCOME: anxiety
EXPOSURE: freq_10_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.7267 -0.5560 -0.0531  0.5806  7.0513

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      2.8395   1.6851
Residual                   0.3792   0.6158
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.079298   0.421113   9.687
sexM            -0.268451   0.306182  -0.877
age             -0.040747   0.009425  -4.323
ms             -0.037494   0.024213  -1.549
ra_sum_250vs10_3h_7d -0.188726  0.056462  -3.343
freq_10_3h_60min_wth -0.010939  0.009931  -1.101
freq_10_3h_60min_btw  0.014032  0.076946   0.182

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_60mn_w
sexM          -0.119
age           -0.774 -0.079
ms_expsc_nt   -0.349 -0.046  0.081
r__25010_3_   -0.092 -0.014 -0.012  0.141
frq_10_3h_60mn_w -0.075 -0.012  0.007  0.176  0.317
frq_10_3h_60mn_b -0.336 -0.043 -0.103  0.042  0.075  0.026

Robustness weights for the residuals:
3369 weights are ~= 1. The remaining 983 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.541  0.717  0.698  0.880  0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.381  0.664  0.820  0.791  0.920  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.08 | 0.42 | [ 3.25, 4.90] | 9.69 | < .001
sex [M] | -0.27 | 0.31 | [-0.87, 0.33] | -0.88 | 0.381
age | -0.04 | 9.42e-03 | [-0.06, -0.02] | -4.32 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.01] | -1.55 | 0.122
ra sum 250vs10 3h 7d | -0.19 | 0.06 | [-0.30, -0.08] | -3.34 | < .001
freq 10 3h 60min wth | -0.01 | 9.93e-03 | [-0.03, 0.01] | -1.10 | 0.271
freq 10 3h 60min btw | 0.01 | 0.08 | [-0.14, 0.16] | 0.18 | 0.855

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.69
SD (Residual) | 0.62

```

```

=====
OUTCOME: anxiety
EXPOSURE: freq_10_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.7419 -0.5597 -0.0534  0.5797  7.0511

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.8281    1.6817
Residual                   0.3793    0.6159
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.011004   0.403460   9.942
sexM           -0.284135   0.305624  -0.930
age            -0.041201   0.009413  -4.377
ms            -0.030615   0.023947  -1.278
ra_sum_250vs10_3h_7d -0.160412  0.055132  -2.910
freq_10_3h_90min_wth 0.006230   0.011073   0.563
freq_10_3h_90min_btw 0.060886   0.091819   0.663

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_90mn_w
sexM          -0.130
age           -0.819 -0.078
ms_expsc_nt   -0.348 -0.045  0.084
r__25010_3_   -0.072 -0.013 -0.014  0.111
frq_10_3h_90mn_w -0.044 -0.009  0.004  0.104  0.239
frq_10_3h_90mn_b -0.200 -0.047 -0.110  0.013  0.064  0.012

Robustness weights for the residuals:
3367 weights are ~= 1. The remaining 985 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.191  0.542   0.719   0.699  0.880   0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.378  0.659   0.809   0.776  0.889   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.01 | 0.40 | [ 3.22, 4.80] | 9.94 | < .001
sex [M] | -0.28 | 0.31 | [-0.88, 0.32] | -0.93 | 0.353
age | -0.04 | 9.41e-03 | [-0.06, -0.02] | -4.38 | < .001
ms | -0.03 | 0.02 | [-0.08, 0.02] | -1.28 | 0.201
ra sum 250vs10 3h 7d | -0.16 | 0.06 | [-0.27, -0.05] | -2.91 | 0.004
freq 10 3h 90min wth | 6.23e-03 | 0.01 | [-0.02, 0.03] | 0.56 | 0.574
freq 10 3h 90min btw | 0.06 | 0.09 | [-0.12, 0.24] | 0.66 | 0.507

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.68
SD (Residual) | 0.62

```

```

=====
OUTCOME: anxiety
EXPOSURE: freq_250_1h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.9831 -0.5656 -0.0553  0.5818  8.1014

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    2.8746   1.6955
Residual                   0.3901   0.6246
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.016425   0.514779   7.802
sexM           -0.348159   0.303957  -1.145
age            -0.040263   0.009310  -4.325
ms             -0.056372   0.022322  -2.525
freq_250_1h_0min_wth 0.038258   0.008398   4.556
freq_250_1h_0min_btw 0.029924   0.082401   0.363

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_1h_0mn_w
sexM          -0.208
age           -0.616 -0.071
ms            -0.285 -0.032  0.081
freq_250_1h_0mn_w -0.026 -0.001  0.007  0.094
freq_250_1h_0mn_b -0.650  0.129 -0.066  0.048  0.005

Robustness weights for the residuals:
3632 weights are ~= 1. The remaining 1050 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.166  0.531  0.721  0.693  0.885  0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.346  0.638  0.836  0.792  0.936  0.993

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.02 | 0.51 | [ 3.01, 5.03] | 7.80 | < .001
sex [M] | -0.35 | 0.30 | [-0.94, 0.25] | -1.15 | 0.252
age | -0.04 | 9.31e-03 | [-0.06, -0.02] | -4.32 | < .001
ms | -0.06 | 0.02 | [-0.10, -0.01] | -2.53 | 0.012
freq 250 1h 0min wth | 0.04 | 8.40e-03 | [ 0.02, 0.05] | 4.56 | < .001
freq 250 1h 0min btw | 0.03 | 0.08 | [-0.13, 0.19] | 0.36 | 0.717

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.70
SD (Residual) | 0.62

```

```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_1h | 15 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.9263 -0.5645 -0.0624 0.5747 8.1735

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8930 1.7009
Residual 0.3909 0.6252
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.262413 0.413408 10.310
sexM -0.329101 0.304367 -1.081
age -0.040561 0.009349 -4.339
ms -0.058076 0.022271 -2.608
freq_250_1h_15min_wth -0.050356 0.011379 -4.425
freq_250_1h_15min_btw -0.113278 0.127030 -0.892

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_1h_15mn_w
sexM -0.120
age -0.848 -0.072
ms -0.306 -0.035 0.082
frq_250_1h_15mn_w 0.018 0.001 -0.004 -0.059
frq_250_1h_15mn_b -0.316 -0.115 0.080 -0.030 0.002

Robustness weights for the residuals:
3629 weights are ~= 1. The remaining 1053 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.530 0.724 0.695 0.887 0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.345 0.656 0.847 0.793 0.935 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.26	0.41	[3.45, 5.07]	10.31	< .001
sex [M]	-0.33	0.30	[-0.93, 0.27]	-1.08	0.280
age	-0.04	9.35e-03	[-0.06, -0.02]	-4.34	< .001
ms	-0.06	0.02	[-0.10, -0.01]	-2.61	0.009
freq 250 1h 15min wth	-0.05	0.01	[-0.07, -0.03]	-4.43	< .001
freq 250 1h 15min btw	-0.11	0.13	[-0.36, 0.14]	-0.89	0.373

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.70
SD (Residual)	0.63

```

=====
OUTCOME: anxiety
EXPOSURE: freq_250_1h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1592 -0.5647 -0.0548  0.5705  8.0895

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 2.8673   1.6933
Residual                0.3912   0.6254
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.328938   0.406719  10.644
sexM            -0.355380   0.301125  -1.180
age             -0.041728   0.009344  -4.466
ms              -0.059885   0.022290  -2.687
freq_250_1h_30min_wth -0.053792   0.017194  -3.129
freq_250_1h_30min_btw -0.344378   0.240704  -1.431

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_1h_30mn_w
sexM          -0.151
age           -0.862 -0.066
ms            -0.317 -0.038  0.083
freq_250_1h_30mn_w  0.023  0.003 -0.006 -0.075
freq_250_1h_30mn_b -0.277 -0.025  0.118 -0.013  0.000

Robustness weights for the residuals:
3631 weights are ~= 1. The remaining 1051 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.530  0.718  0.694  0.884  0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.344  0.664  0.865  0.801  0.949  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.33 | 0.41 | [ 3.53, 5.13] | 10.64 | < .001
sex [M] | -0.36 | 0.30 | [-0.95, 0.23] | -1.18 | 0.238
age | -0.04 | 9.34e-03 | [-0.06, -0.02] | -4.47 | < .001
ms | -0.06 | 0.02 | [-0.10, -0.02] | -2.69 | 0.007
freq 250 1h 30min wth | -0.05 | 0.02 | [-0.09, -0.02] | -3.13 | 0.002
freq 250 1h 30min btw | -0.34 | 0.24 | [-0.82, 0.13] | -1.43 | 0.153

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.69
SD (Residual) | 0.63

```

```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_2h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.0326 -0.5623 -0.0573 0.5814 8.0887

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8568 1.6902
Residual 0.3912 0.6254
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.958140 0.452743 8.743
sexM -0.338316 0.301762 -1.121
age -0.039716 0.009265 -4.286
ms -0.063771 0.022300 -2.860
freq_250_2h_0min_wth 0.012547 0.008481 1.479
freq_250_2h_0min_btw 0.077574 0.084751 0.915

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_2h_0mn_w
sexM -0.188
age -0.763 -0.060
ms -0.297 -0.037 0.085
freq_250_2h_0mn_w -0.023 -0.001 0.006 0.081
freq_250_2h_0mn_b -0.507 0.092 0.028 0.017 0.002

Robustness weights for the residuals:
3621 weights are ~= 1. The remaining 1061 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.166 0.530 0.726 0.696 0.889 0.999

Robustness weights for the random effects:
130 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.346 0.633 0.865 0.807 0.957 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.96	0.45	[3.07, 4.85]	8.74	< .001
sex [M]	-0.34	0.30	[-0.93, 0.25]	-1.12	0.262
age	-0.04	9.27e-03	[-0.06, -0.02]	-4.29	< .001
ms	-0.06	0.02	[-0.11, -0.02]	-2.86	0.004
freq 250 2h 0min wth	0.01	8.48e-03	[0.00, 0.03]	1.48	0.139
freq 250 2h 0min btw	0.08	0.08	[-0.09, 0.24]	0.92	0.360

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.69
SD (Residual)	0.63

```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_2h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.8733 -0.5687 -0.0682 0.5830 8.1455

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8857 1.6987
Residual 0.3926 0.6266
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.411910 0.424683 10.389
sexM -0.315533 0.303622 -1.039
age -0.040385 0.009326 -4.330
ms -0.062502 0.022275 -2.806
freq_250_2h_30min_wth -0.038196 0.009418 -4.056
freq_250_2h_30min_btw -0.152689 0.098482 -1.550

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_30mn_w
sexM -0.112
age -0.825 -0.069
ms -0.300 -0.036 0.083
frq_250_2h_30mn_w 0.006 0.000 -0.001 -0.020
frq_250_2h_30mn_b -0.385 -0.104 0.063 -0.018 0.000

Robustness weights for the residuals:
3626 weights are ~= 1. The remaining 1056 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.534 0.731 0.698 0.890 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.343 0.681 0.881 0.815 0.956 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.41	0.42	[3.58, 5.24]	10.39	< .001
sex [M]	-0.32	0.30	[-0.91, 0.28]	-1.04	0.299
age	-0.04	9.33e-03	[-0.06, -0.02]	-4.33	< .001
ms	-0.06	0.02	[-0.11, -0.02]	-2.81	0.005
freq 250 2h 30min wth	-0.04	9.42e-03	[-0.06, -0.02]	-4.06	< .001
freq 250 2h 30min btw	-0.15	0.10	[-0.35, 0.04]	-1.55	0.121

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.70
SD (Residual)	0.63


```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_2h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.0188 -0.5672 -0.0616 0.5771 8.0606

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.889 1.6998
Residual 0.392 0.6261
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.308790 0.401240 10.739
sexM -0.323802 0.303392 -1.067
age -0.040440 0.009318 -4.340
ms -0.066063 0.022253 -2.969
freq_250_2h_60min_wth -0.046038 0.014490 -3.177
freq_250_2h_60min_btw -0.225086 0.163878 -1.373

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_60mn_w
sexM -0.142
age -0.856 -0.066
ms -0.323 -0.037 0.084
frq_250_2h_60mn_w 0.000 0.000 0.000 0.000
frq_250_2h_60mn_b -0.213 -0.090 0.031 -0.010 0.001

Robustness weights for the residuals:
3625 weights are ~= 1. The remaining 1057 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.167 0.533 0.726 0.696 0.889 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.350 0.648 0.848 0.790 0.925 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.31	0.40	[3.52, 5.10]	10.74	< .001
sex [M]	-0.32	0.30	[-0.92, 0.27]	-1.07	0.286
age	-0.04	9.32e-03	[-0.06, -0.02]	-4.34	< .001
ms	-0.07	0.02	[-0.11, -0.02]	-2.97	0.003
freq 250 2h 60min wth	-0.05	0.01	[-0.07, -0.02]	-3.18	0.001
freq 250 2h 60min btw	-0.23	0.16	[-0.55, 0.10]	-1.37	0.170

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.70
SD (Residual)	0.63

```

=====
OUTCOME: anxiety
EXPOSURE: freq_250_2h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1633 -0.5656 -0.0555  0.5766  8.0894

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 2.8388   1.6849
Residual                0.3911   0.6254
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.252919   0.391423  10.865
sexM            -0.318666   0.300619  -1.060
age            -0.040514   0.009234  -4.387
ms             -0.063603   0.022226  -2.862
freq_250_2h_90min_wth -0.092129   0.033194  -2.775
freq_250_2h_90min_btw -0.788218   0.482119  -1.635

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_2h_90mn_w
sexM          -0.154
age           -0.866 -0.064
ms            -0.332 -0.039  0.085
freq_250_2h_90mn_w  0.009  0.001 -0.002 -0.028
freq_250_2h_90mn_b -0.112 -0.085  0.020 -0.001 -0.001

Robustness weights for the residuals:
3628 weights are ~= 1. The remaining 1054 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.527  0.725  0.695  0.889  0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.340  0.653  0.852  0.803  0.951  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.25 | 0.39 | [ 3.49, 5.02] | 10.87 | < .001
sex [M] | -0.32 | 0.30 | [-0.91, 0.27] | -1.06 | 0.289
age | -0.04 | 9.23e-03 | [-0.06, -0.02] | -4.39 | < .001
ms | -0.06 | 0.02 | [-0.11, -0.02] | -2.86 | 0.004
freq 250 2h 90min wth | -0.09 | 0.03 | [-0.16, -0.03] | -2.78 | 0.006
freq 250 2h 90min btw | -0.79 | 0.48 | [-1.73, 0.16] | -1.63 | 0.102

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.68
SD (Residual) | 0.63

```

```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_3h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.0401 -0.5637 -0.0545 0.5774 8.1420

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8725 1.6948
Residual 0.3904 0.6248
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.099674 0.442195 9.271
sexM -0.350898 0.301863 -1.162
age -0.039855 0.009333 -4.271
ms -0.065589 0.022240 -2.949
freq_250_3h_0min_wth 0.019542 0.009700 2.015
freq_250_3h_0min_btw 0.040471 0.097232 0.416

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_3h_0mn_w
sexM -0.174
age -0.811 -0.057
ms -0.295 -0.038 0.084
freq_250_3h_0mn_w -0.014 0.000 0.003 0.055
freq_250_3h_0mn_b -0.467 0.061 0.099 0.001 0.001

Robustness weights for the residuals:
3619 weights are ~= 1. The remaining 1063 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.532 0.726 0.696 0.887 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.347 0.627 0.833 0.791 0.933 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.10	0.44	[3.23, 4.97]	9.27	< .001
sex [M]	-0.35	0.30	[-0.94, 0.24]	-1.16	0.245
age	-0.04	9.33e-03	[-0.06, -0.02]	-4.27	< .001
ms	-0.07	0.02	[-0.11, -0.02]	-2.95	0.003
freq 250 3h 0min wth	0.02	9.70e-03	[0.00, 0.04]	2.01	0.044
freq 250 3h 0min btw	0.04	0.10	[-0.15, 0.23]	0.42	0.677

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.69
SD (Residual)	0.62

```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_3h | 120 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.0260 -0.5699 -0.0594 0.5776 8.0694

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8567 1.6902
Residual 0.3909 0.6253
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.308561 0.399220 10.792
sexM -0.330956 0.301539 -1.098
age -0.041341 0.009294 -4.448
ms -0.063484 0.022226 -2.856
freq_250_3h_120min_wth -0.057844 0.021208 -2.727
freq_250_3h_120min_btw -0.389868 0.269908 -1.444

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_120mn_w
sexM -0.143
age -0.864 -0.070
ms -0.323 -0.037 0.083
frq_250_3h_120mn_w 0.008 0.001 -0.002 -0.026
frq_250_3h_120mn_b -0.213 -0.084 0.084 -0.013 0.001

Robustness weights for the residuals:
3625 weights are ~= 1. The remaining 1057 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.167 0.529 0.724 0.695 0.887 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.344 0.661 0.864 0.805 0.954 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.31	0.40	[3.53, 5.09]	10.79	< .001
sex [M]	-0.33	0.30	[-0.92, 0.26]	-1.10	0.272
age	-0.04	9.29e-03	[-0.06, -0.02]	-4.45	< .001
ms	-0.06	0.02	[-0.11, -0.02]	-2.86	0.004
freq 250 3h 120min wth	-0.06	0.02	[-0.10, -0.02]	-2.73	0.006
freq 250 3h 120min btw	-0.39	0.27	[-0.92, 0.14]	-1.44	0.149

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.69
SD (Residual)	0.63

```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_3h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.9159 -0.5637 -0.0588 0.5794 8.1268

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8922 1.7006
Residual 0.3909 0.6252
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.411367 0.434291 10.158
sexM -0.326199 0.303460 -1.075
age -0.038827 0.009327 -4.163
ms -0.063012 0.022229 -2.835
freq_250_3h_30min_wth -0.032095 0.008661 -3.705
freq_250_3h_30min_btw -0.111579 0.080530 -1.386

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_30mn_w
sexM -0.112
age -0.765 -0.059
ms -0.301 -0.038 0.084
frq_250_3h_30mn_w 0.006 0.000 -0.001 -0.024
frq_250_3h_30mn_b -0.430 -0.086 -0.045 0.003 0.000

Robustness weights for the residuals:
3627 weights are ~= 1. The remaining 1055 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.166 0.530 0.722 0.695 0.891 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.348 0.686 0.890 0.816 0.965 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.41	0.43	[3.56, 5.26]	10.16	< .001
sex [M]	-0.33	0.30	[-0.92, 0.27]	-1.07	0.282
age	-0.04	9.33e-03	[-0.06, -0.02]	-4.16	< .001
ms	-0.06	0.02	[-0.11, -0.02]	-2.83	0.005
freq 250 3h 30min wth	-0.03	8.66e-03	[-0.05, -0.02]	-3.71	< .001
freq 250 3h 30min btw	-0.11	0.08	[-0.27, 0.05]	-1.39	0.166

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.70
SD (Residual)	0.63

```

=====
OUTCOME: anxiety
EXPOSURE: freq_250_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.9097 -0.5650 -0.0709  0.5800  8.1859

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 2.8941   1.701
 Residual                0.3919   0.626
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.380808   0.413028  10.607
sexM            -0.312180   0.304238  -1.026
age            -0.039950   0.009322  -4.285
ms             -0.068127   0.022253  -3.062
freq_250_3h_60min_wth -0.046130   0.010401  -4.435
freq_250_3h_60min_btw -0.147808   0.099280  -1.489

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_60mn_w
sexM          -0.122
age           -0.831 -0.064
ms            -0.315 -0.038  0.084
frq_250_3h_60mn_w -0.004 -0.001  0.001  0.013
frq_250_3h_60mn_b -0.312 -0.109  0.016 -0.001  0.000

Robustness weights for the residuals:
3634 weights are ~= 1. The remaining 1048 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.164  0.530  0.727  0.695  0.884  0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.347  0.666  0.884  0.809  0.952  0.993

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.38 | 0.41 | [ 3.57, 5.19] | 10.61 | < .001
sex [M] | -0.31 | 0.30 | [-0.91, 0.28] | -1.03 | 0.305
age | -0.04 | 9.32e-03 | [-0.06, -0.02] | -4.29 | < .001
ms | -0.07 | 0.02 | [-0.11, -0.02] | -3.06 | 0.002
freq 250 3h 60min wth | -0.05 | 0.01 | [-0.07, -0.03] | -4.44 | < .001
freq 250 3h 60min btw | -0.15 | 0.10 | [-0.34, 0.05] | -1.49 | 0.137

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.70
SD (Residual) | 0.63

```

```
=====
OUTCOME: anxiety
EXPOSURE: freq_250_3h | 90 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.0174 -0.5686 -0.0627 0.5836 8.0510

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 2.8763 1.6960
Residual 0.3911 0.6254
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.359047 0.404346 10.780
sexM -0.320117 0.302735 -1.057
age -0.040908 0.009307 -4.395
ms -0.068037 0.022234 -3.060
freq_250_3h_90min_wth -0.048507 0.012843 -3.777
freq_250_3h_90min_btw -0.215153 0.140996 -1.526

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_3h_90mn_w
sexM -0.136
age -0.854 -0.068
ms -0.320 -0.038 0.084
freq_250_3h_90mn_w -0.009 -0.001 0.003 0.027
freq_250_3h_90mn_b -0.253 -0.090 0.055 -0.008 0.001

Robustness weights for the residuals:
3624 weights are ~= 1. The remaining 1058 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.167 0.533 0.727 0.696 0.890 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.346 0.663 0.874 0.804 0.960 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.36	0.40	[3.57, 5.15]	10.78	< .001
sex [M]	-0.32	0.30	[-0.91, 0.27]	-1.06	0.290
age	-0.04	9.31e-03	[-0.06, -0.02]	-4.40	< .001
ms	-0.07	0.02	[-0.11, -0.02]	-3.06	0.002
freq 250 3h 90min wth	-0.05	0.01	[-0.07, -0.02]	-3.78	< .001
freq 250 3h 90min btw	-0.22	0.14	[-0.49, 0.06]	-1.53	0.127

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.70
SD (Residual)	0.63

```

=====
OUTCOME: appetite
EXPOSURE: fffreq_1 | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1732 -0.6221  0.0112  0.6129  5.8218

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.416     1.1901
Residual                   0.163     0.4037
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.055953   0.476624   8.510
sexM            0.226608   0.215932   1.049
age           -0.004047   0.007070  -0.572
ms             0.060434   0.015802   3.824
ra_sum_250vs1_7d 0.076445   0.047454   1.611
fffreq_1_0min_wth 0.024204   0.006147   3.937
fffreq_1_0min_btw -0.113440  0.067890  -1.671

Correlation of Fixed Effects:
              (Intr) sexM    age    ms_xp_ r__250 fffrq_1_0mn_w
sexM          -0.100
age          -0.759 -0.072
ms_expsc_nt  -0.175 -0.041  0.067
r_sm_250l_7  -0.061 -0.004  0.001  0.076
fffrq_1_0mn_w 0.038  0.009 -0.006 -0.152 -0.311
fffrq_1_0mn_b -0.808  0.018  0.353 -0.027 -0.042  0.020

Robustness weights for the residuals:
3448 weights are ~= 1. The remaining 904 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.592   0.763   0.741  0.923   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.382  0.692   0.834   0.788  0.908   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.06 | 0.48 | [ 3.12, 4.99] | 8.51 | < .001
sex [M] | 0.23 | 0.22 | [-0.20, 0.65] | 1.05 | 0.294
age | -4.05e-03 | 7.07e-03 | [-0.02, 0.01] | -0.57 | 0.567
ms | 0.06 | 0.02 | [ 0.03, 0.09] | 3.82 | < .001
ra_sum_250vs1_7d | 0.08 | 0.05 | [-0.02, 0.17] | 1.61 | 0.107
fffreq_1_0min_wth | 0.02 | 6.15e-03 | [ 0.01, 0.04] | 3.94 | < .001
fffreq_1_0min_btw | -0.11 | 0.07 | [-0.25, 0.02] | -1.67 | 0.095

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.19
SD (Residual) | 0.40

```



```
=====
OUTCOME: appetite
EXPOSURE: fffreq_1 | 15 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.0404 -0.6217 0.0102 0.6195 5.8037

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4718 1.2132
Residual 0.1629 0.4036
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.392e+00 2.854e-01 11.884
sexM 2.218e-01 2.203e-01 1.007
age 3.120e-04 7.330e-03 0.043
ms 6.502e-02 1.570e-02 4.140
ra_sum_250vs1_7d 6.817e-02 4.963e-02 1.374
fffrq_1_15min_wth -2.837e-02 8.591e-03 -3.302
fffrq_1_15min_btw -2.706e-05 1.086e-01 0.000

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_15mn_w
sexM -0.144
age -0.785 -0.058
ms_expsc_nt -0.328 -0.040 0.066
r_sm_250l_7 -0.164 -0.006 -0.006 0.069
fffrq_1_15mn_w -0.091 -0.006 0.001 0.099 0.417
fffrq_1_15mn_b -0.016 -0.048 -0.392 0.019 0.055 0.023

Robustness weights for the residuals:
3452 weights are ~1. The remaining 900 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.167 0.593 0.762 0.739 0.916 0.999

Robustness weights for the random effects:
126 weights are ~1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.403 0.723 0.813 0.796 0.915 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.39	0.29	[2.83, 3.95]	11.88	< .001
sex [M]	0.22	0.22	[-0.21, 0.65]	1.01	0.314
age	3.12e-04	7.33e-03	[-0.01, 0.01]	0.04	0.966
ms	0.07	0.02	[0.03, 0.10]	4.14	< .001
ra_sum_250vs1_7d	0.07	0.05	[-0.03, 0.17]	1.37	0.170
fffrq_1_15min_wth	-0.03	8.59e-03	[-0.05, -0.01]	-3.30	< .001
fffrq_1_15min_btw	-2.71e-05	0.11	[-0.21, 0.21]	-2.49e-04	> .999

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	0.40

```
=====
OUTCOME: appetite
EXPOSURE: fffreq_1 | 30 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.0041 -0.6199  0.0109  0.6192  5.8443
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.4753    1.2146
Residual                   0.1631    0.4038
Number of obs: 4352, groups: id, 156
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.371150   0.287846  11.712
sexM            0.224558   0.220303   1.019
age            0.002011   0.007446   0.270
ms            0.065603   0.015709   4.176
ra_sum_250vs1_7d 0.065752   0.049875   1.318
fffreq_1_30min_wth -0.039411 0.011844  -3.327
fffreq_1_30min_btw -0.087427 0.153428  -0.570
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 fffrq_1_30mn_w
sexM          -0.144
age          -0.826 -0.077
ms_expsc_nt  -0.324 -0.039  0.068
r_sm_250l_7   -0.156 -0.002 -0.010  0.069
fffreq_1_30mn_w -0.088 -0.004  0.000  0.099  0.425
fffreq_1_30mn_b 0.121  0.003 -0.422  0.012  0.058  0.022
```

```
Robustness weights for the residuals:
3455 weights are ~= 1. The remaining 897 ones are summarized as
Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
0.168  0.592   0.760   0.738  0.920   0.999
```

```
Robustness weights for the random effects:
128 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
0.407  0.706   0.800   0.788  0.899   0.995
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.37	0.29	[2.81, 3.94]	11.71	< .001
sex [M]	0.22	0.22	[-0.21, 0.66]	1.02	0.308
age	2.01e-03	7.45e-03	[-0.01, 0.02]	0.27	0.787
ms	0.07	0.02	[0.03, 0.10]	4.18	< .001
ra_sum_250vs1_7d	0.07	0.05	[-0.03, 0.16]	1.32	0.187
fffreq_1_30min_wth	-0.04	0.01	[-0.06, -0.02]	-3.33	< .001
fffreq_1_30min_btw	-0.09	0.15	[-0.39, 0.21]	-0.57	0.569

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	0.40

```

=====
OUTCOME: appetite
EXPOSURE: freq_10_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.2278 -0.6166  0.0143  0.6204  5.8652

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.4557    1.2065
Residual                   0.1643    0.4054
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.568790   0.303870  11.744
sexM            0.256683   0.220211   1.166
age           -0.000691   0.006761  -0.102
ms             0.070879   0.015787   4.490
ra_sum_250vs10_3h_7d 0.014158   0.035861   0.395
freq_10_3h_0min_wth 0.009828   0.008781   1.119
freq_10_3h_0min_btw -0.135037  0.096091  -1.405

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_0mn_w
sexM          -0.092
age          -0.845 -0.096
ms_expsc_nt   -0.284 -0.035  0.073
r__25010_3_   -0.033 -0.004 -0.012  0.100
frq_10_3h_0mn_w 0.015  0.003  0.001 -0.063 -0.185
frq_10_3h_0mn_b -0.383 -0.110  0.129 -0.046 -0.043  0.039

Robustness weights for the residuals:
3443 weights are ~= 1. The remaining 909 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.163  0.599   0.770   0.744  0.929   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.407  0.703   0.831   0.795  0.921   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.57 | 0.30 | [ 2.97, 4.16] | 11.74 | < .001
sex [M] | 0.26 | 0.22 | [-0.18, 0.69] | 1.17 | 0.244
age | -6.91e-04 | 6.76e-03 | [-0.01, 0.01] | -0.10 | 0.919
ms | 0.07 | 0.02 | [ 0.04, 0.10] | 4.49 | < .001
ra sum 250vs10 3h 7d | 0.01 | 0.04 | [-0.06, 0.08] | 0.39 | 0.693
freq 10 3h 0min wth | 9.83e-03 | 8.78e-03 | [-0.01, 0.03] | 1.12 | 0.263
freq 10 3h 0min btw | -0.14 | 0.10 | [-0.32, 0.05] | -1.41 | 0.160

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.21
SD (Residual) | 0.41

```

```
=====
OUTCOME: appetite
EXPOSURE: freq_10_3h | 120 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2164 -0.6218 0.0119 0.6171 6.0030

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4793 1.2163
Residual 0.1644 0.4054
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.3869485 0.2836142 11.942
sexM 0.2070670 0.2216011 0.934
age -0.0001489 0.0068396 -0.022
ms 0.0727823 0.0157935 4.608
ra_sum_250vs10_3h_7d 0.0283713 0.0356364 0.796
freq_10_3h_120min_wth 0.0195803 0.0093319 2.098
freq_10_3h_120min_btw 0.0442523 0.0988278 0.448

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_120mn_w
sexM -0.138
age -0.843 -0.067
ms_expsc_nt -0.324 -0.040 0.078
r__25010_3_ -0.055 -0.013 -0.014 0.098
frq_10_3h_120mn_w -0.028 -0.006 0.003 0.077 0.143
frq_10_3h_120mn_b -0.081 -0.094 -0.154 -0.001 0.048 0.000

Robustness weights for the residuals:
3447 weights are ~= 1. The remaining 905 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.594 0.766 0.743 0.926 0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.401 0.723 0.813 0.797 0.920 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.39	0.28	[2.83, 3.94]	11.94	< .001
sex [M]	0.21	0.22	[-0.23, 0.64]	0.93	0.350
age	-1.49e-04	6.84e-03	[-0.01, 0.01]	-0.02	0.983
ms	0.07	0.02	[0.04, 0.10]	4.61	< .001
ra_sum_250vs10_3h_7d	0.03	0.04	[-0.04, 0.10]	0.80	0.426
freq_10_3h_120min_wth	0.02	9.33e-03	[0.00, 0.04]	2.10	0.036
freq_10_3h_120min_btw	0.04	0.10	[-0.15, 0.24]	0.45	0.654

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.22
SD (Residual)	0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_10_3h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1787 -0.6192 0.0152 0.6184 5.8658

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4192 1.1913
Residual 0.1644 0.4055
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.0811816 0.3253079 9.472
sexM 0.2193522 0.2161623 1.015
age -0.0003744 0.0066469 -0.056
ms 0.0700143 0.0160995 4.349
ra_sum_250vs10_3h_7d 0.0146694 0.0380247 0.386
freq_10_3h_30min_wth -0.0044016 0.0063952 -0.688
freq_10_3h_30min_btw 0.0956046 0.0501743 1.905

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_30mn_w
sexM -0.115
age -0.693 -0.082
ms_expsc_nt -0.319 -0.043 0.075
r__25010_3_ -0.105 -0.013 -0.010 0.160
frq_10_3h_30mn_w -0.086 -0.012 0.007 0.206 0.371
frq_10_3h_30mn_b -0.518 -0.017 -0.088 0.059 0.081 0.038

Robustness weights for the residuals:
3447 weights are ~1. The remaining 905 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.598 0.768 0.743 0.925 0.999

Robustness weights for the random effects:
122 weights are ~1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.417 0.701 0.837 0.809 0.954 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.08	0.33	[2.44, 3.72]	9.47	< .001
sex [M]	0.22	0.22	[-0.20, 0.64]	1.01	0.310
age	-3.74e-04	6.65e-03	[-0.01, 0.01]	-0.06	0.955
ms	0.07	0.02	[0.04, 0.10]	4.35	< .001
ra_sum_250vs10_3h_7d	0.01	0.04	[-0.06, 0.09]	0.39	0.700
freq_10_3h_30min_wth	-4.40e-03	6.40e-03	[-0.02, 0.01]	-0.69	0.491
freq_10_3h_30min_btw	0.10	0.05	[0.00, 0.19]	1.91	0.057

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.19
SD (Residual)	0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_10_3h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1667 -0.6198 0.0062 0.6231 6.0292

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.4729 1.2136
Residual 0.1641 0.4051
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.249e+00 3.001e-01 10.826
sexM 2.047e-01 2.203e-01 0.929
age -1.407e-05 6.780e-03 -0.002
ms 8.050e-02 1.600e-02 5.033
ra_sum_250vs10_3h_7d 5.755e-02 3.719e-02 1.548
freq_10_3h_60min_wth 2.029e-02 6.534e-03 3.105
freq_10_3h_60min_btw 5.256e-02 5.536e-02 0.949

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_60mn_w
sexM -0.123
age -0.778 -0.078
ms_expsc_nt -0.323 -0.043 0.075
r__25010_3_ -0.085 -0.013 -0.011 0.140
frq_10_3h_60mn_w -0.070 -0.011 0.006 0.177 0.317
frq_10_3h_60mn_b -0.337 -0.043 -0.104 0.038 0.069 0.024

Robustness weights for the residuals:
3448 weights are ~= 1. The remaining 904 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.592 0.767 0.742 0.923 0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.410 0.720 0.816 0.794 0.913 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.25	0.30	[2.66, 3.84]	10.83	< .001
sex [M]	0.20	0.22	[-0.23, 0.64]	0.93	0.353
age	-1.41e-05	6.78e-03	[-0.01, 0.01]	-2.07e-03	0.998
ms	0.08	0.02	[0.05, 0.11]	5.03	< .001
ra_sum_250vs10_3h_7d	0.06	0.04	[-0.02, 0.13]	1.55	0.122
freq_10_3h_60min_wth	0.02	6.53e-03	[0.01, 0.03]	3.11	0.002
freq_10_3h_60min_btw	0.05	0.06	[-0.06, 0.16]	0.95	0.342

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.21
SD (Residual)	0.41

```

=====
OUTCOME: appetite
EXPOSURE: freq_10_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1879 -0.6212  0.0140  0.6163  5.9128

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.4803    1.2167
Residual                   0.1644    0.4054
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.384e+00  2.888e-01  11.718
sexM            2.152e-01  2.209e-01   0.974
age             1.815e-05  6.802e-03   0.003
ms              7.116e-02  1.583e-02   4.494
ra_sum_250vs10_3h_7d 2.214e-02  3.634e-02   0.609
freq_10_3h_90min_wth 1.999e-03  7.290e-03   0.274
freq_10_3h_90min_btw 2.694e-02  6.637e-02   0.406

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_90mn_w
sexM          -0.134
age           -0.823 -0.077
ms_expsc_nt   -0.322 -0.041  0.077
r__25010_3_    -0.066 -0.012 -0.013  0.111
frq_10_3h_90mn_w -0.041 -0.008  0.003  0.104  0.239
frq_10_3h_90mn_b -0.201 -0.047 -0.110  0.012  0.058  0.011

Robustness weights for the residuals:
3444 weights are ~= 1. The remaining 908 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.164  0.595   0.770   0.743  0.928   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.404  0.723   0.813   0.797  0.916   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.38 | 0.29 | [ 2.82, 3.95] | 11.72 | < .001
sex [M] | 0.22 | 0.22 | [-0.22, 0.65] | 0.97 | 0.330
age | 1.81e-05 | 6.80e-03 | [-0.01, 0.01] | 2.67e-03 | 0.998
ms | 0.07 | 0.02 | [ 0.04, 0.10] | 4.49 | < .001
ra sum 250vs10 3h 7d | 0.02 | 0.04 | [-0.05, 0.09] | 0.61 | 0.542
freq 10 3h 90min wth | 2.00e-03 | 7.29e-03 | [-0.01, 0.02] | 0.27 | 0.784
freq 10 3h 90min btw | 0.03 | 0.07 | [-0.10, 0.16] | 0.41 | 0.685

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.22
SD (Residual) | 0.41

```

```
=====
OUTCOME: appetite
EXPOSURE: freq_250_1h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2110 -0.6184 0.0132 0.6205 5.6656

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.328 1.1525
Residual 0.168 0.4099
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.903553 0.348931 11.187
sexM 0.173786 0.206554 0.841
age -0.001741 0.006326 -0.275
ms 0.070154 0.014672 4.781
freq_250_1h_0min_wth -0.011319 0.005511 -2.054
freq_250_1h_0min_btw -0.087035 0.055994 -1.554

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_1h_0mn_w
sexM -0.210
age -0.617 -0.071
ms -0.276 -0.031 0.078
frq_250_1h_0mn_w -0.025 -0.001 0.006 0.094
frq_250_1h_0mn_b -0.651 0.129 -0.066 0.047 0.005

Robustness weights for the residuals:
3705 weights are ~= 1. The remaining 977 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.187 0.594 0.762 0.736 0.916 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.358 0.665 0.744 0.747 0.826 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.90	0.35	[3.22, 4.59]	11.19	< .001
sex [M]	0.17	0.21	[-0.23, 0.58]	0.84	0.400
age	-1.74e-03	6.33e-03	[-0.01, 0.01]	-0.28	0.783
ms	0.07	0.01	[0.04, 0.10]	4.78	< .001
freq 250 1h 0min wth	-0.01	5.51e-03	[-0.02, 0.00]	-2.05	0.040
freq 250 1h 0min btw	-0.09	0.06	[-0.20, 0.02]	-1.55	0.120

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.15
SD (Residual)	0.41


```
=====
OUTCOME: appetite
EXPOSURE: freq_250_1h | 15 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2367 -0.6192 0.0149 0.6252 5.7216

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3703 1.171
Residual 0.1681 0.410
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.514094 0.283267 12.406
sexM 0.223477 0.209399 1.067
age -0.002042 0.006431 -0.318
ms 0.072664 0.014638 4.964
freq_250_1h_15min_wth 0.010445 0.007463 1.400
freq_250_1h_15min_btw 0.009953 0.087397 0.114

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_1h_15mn_w
sexM -0.121
age -0.849 -0.071
ms -0.293 -0.033 0.078
frq_250_1h_15mn_w 0.017 0.001 -0.004 -0.059
frq_250_1h_15mn_b -0.318 -0.115 0.080 -0.029 0.002

Robustness weights for the residuals:
3711 weights are ~= 1. The remaining 971 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.186 0.595 0.759 0.735 0.916 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.384 0.685 0.778 0.761 0.865 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.51	0.28	[2.96, 4.07]	12.41	< .001
sex [M]	0.22	0.21	[-0.19, 0.63]	1.07	0.286
age	-2.04e-03	6.43e-03	[-0.01, 0.01]	-0.32	0.751
ms	0.07	0.01	[0.04, 0.10]	4.96	< .001
freq 250 1h 15min wth	0.01	7.46e-03	[0.00, 0.03]	1.40	0.162
freq 250 1h 15min btw	9.95e-03	0.09	[-0.16, 0.18]	0.11	0.909

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_250_1h | 30 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.1889 -0.6248  0.0161  0.6275  5.7139
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3750    1.1726
Residual                   0.1687    0.4107
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.548227   0.280192  12.664
sexM            0.229389   0.208439   1.101
age           -0.002267   0.006467  -0.351
ms             0.071930   0.014673   4.902
freq_250_1h_30min_wth 0.025011   0.011292   2.215
freq_250_1h_30min_btw -0.053513   0.166641  -0.321
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_30mn_w
sexM          -0.153
age          -0.864 -0.065
ms          -0.303 -0.036  0.079
frq_250_1h_30mn_w  0.022  0.003 -0.005 -0.075
frq_250_1h_30mn_b -0.279 -0.025  0.119 -0.013  0.000
```

```
Robustness weights for the residuals:
3715 weights are ~= 1. The remaining 967 ones are summarized as
    Min. 1st Qu.  Median      Mean 3rd Qu.      Max.
  0.187  0.598   0.759   0.737   0.915   0.999
```

```
Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
    Min. 1st Qu.  Median      Mean 3rd Qu.      Max.
  0.387  0.688   0.781   0.765   0.879   0.994
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.55	0.28	[3.00, 4.10]	12.66	< .001
sex [M]	0.23	0.21	[-0.18, 0.64]	1.10	0.271
age	-2.27e-03	6.47e-03	[-0.01, 0.01]	-0.35	0.726
ms	0.07	0.01	[0.04, 0.10]	4.90	< .001
freq 250 1h 30min wth	0.03	0.01	[0.00, 0.05]	2.22	0.027
freq 250 1h 30min btw	-0.05	0.17	[-0.38, 0.27]	-0.32	0.748

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_250_2h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2848 -0.6191 0.0125 0.6246 5.7117

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3215 1.15
Residual 0.1681 0.41
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.842550 0.306951 12.518
sexM 0.178638 0.205179 0.871
age -0.002729 0.006299 -0.433
ms 0.072687 0.014644 4.964
freq_250_2h_0min_wth -0.003696 0.005560 -0.665
freq_250_2h_0min_btw -0.110456 0.057626 -1.917

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_2h_0mn_w
sexM -0.189
age -0.764 -0.060
ms -0.287 -0.036 0.082
freq_250_2h_0mn_w -0.022 -0.001 0.006 0.081
freq_250_2h_0mn_b -0.508 0.092 0.028 0.016 0.002

Robustness weights for the residuals:
3708 weights are ~= 1. The remaining 974 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.185 0.595 0.759 0.735 0.913 0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.380 0.671 0.745 0.758 0.853 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.84	0.31	[3.24, 4.44]	12.52	< .001
sex [M]	0.18	0.21	[-0.22, 0.58]	0.87	0.384
age	-2.73e-03	6.30e-03	[-0.02, 0.01]	-0.43	0.665
ms	0.07	0.01	[0.04, 0.10]	4.96	< .001
freq 250 2h 0min wth	-3.70e-03	5.56e-03	[-0.01, 0.01]	-0.66	0.506
freq 250 2h 0min btw	-0.11	0.06	[-0.22, 0.00]	-1.92	0.055

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.15
SD (Residual)	0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_250_2h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2201 -0.6225 0.0135 0.6287 5.7561

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3760 1.1730
Residual 0.1678 0.4096
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.556503 0.291843 12.186
sexM 0.237876 0.209567 1.135
age -0.002118 0.006436 -0.329
ms 0.072934 0.014598 4.996
freq_250_2h_30min_wth 0.018880 0.006157 3.066
freq_250_2h_30min_btw -0.024728 0.067983 -0.364

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_30mn_w
sexM -0.113
age -0.827 -0.069
ms -0.286 -0.035 0.079
frq_250_2h_30mn_w 0.005 0.000 -0.001 -0.020
frq_250_2h_30mn_b -0.388 -0.104 0.063 -0.017 0.000

Robustness weights for the residuals:
3711 weights are ~= 1. The remaining 971 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.186 0.597 0.762 0.735 0.913 0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.390 0.698 0.786 0.775 0.885 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.56	0.29	[2.98, 4.13]	12.19	< .001
sex [M]	0.24	0.21	[-0.17, 0.65]	1.14	0.256
age	-2.12e-03	6.44e-03	[-0.01, 0.01]	-0.33	0.742
ms	0.07	0.01	[0.04, 0.10]	5.00	< .001
freq 250 2h 30min wth	0.02	6.16e-03	[0.01, 0.03]	3.07	0.002
freq 250 2h 30min btw	-0.02	0.07	[-0.16, 0.11]	-0.36	0.716

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.41

```

=====
OUTCOME: appetite
EXPOSURE: freq_250_2h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.2764 -0.6187  0.0139  0.6212  5.7152

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 1.3783   1.1740
Residual                0.1682   0.4101
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.557209   0.275655  12.905
sexM            0.254467   0.209460   1.215
age           -0.002006   0.006432  -0.312
ms             0.073687   0.014611   5.043
freq_250_2h_60min_wth 0.001971   0.009491   0.208
freq_250_2h_60min_btw -0.104986   0.113152  -0.928

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_2h_60mn_w
sexM          -0.144
age          -0.858 -0.065
ms          -0.308 -0.036  0.080
frq_250_2h_60mn_w 0.000  0.000  0.000  0.000
frq_250_2h_60mn_b -0.214 -0.090  0.031 -0.010  0.001

Robustness weights for the residuals:
3706 weights are ~= 1. The remaining 976 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.185  0.597  0.761  0.736  0.915  0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.393  0.693  0.788  0.771  0.884  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.56 | 0.28 | [ 3.02, 4.10] | 12.90 | < .001
sex [M] | 0.25 | 0.21 | [-0.16, 0.67] | 1.21 | 0.224
age | -2.01e-03 | 6.43e-03 | [-0.01, 0.01] | -0.31 | 0.755
ms | 0.07 | 0.01 | [ 0.05, 0.10] | 5.04 | < .001
freq 250 2h 60min wth | 1.97e-03 | 9.49e-03 | [-0.02, 0.02] | 0.21 | 0.835
freq 250 2h 60min btw | -0.10 | 0.11 | [-0.33, 0.12] | -0.93 | 0.354

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.17
SD (Residual) | 0.41

```

```

=====
OUTCOME: appetite
EXPOSURE: freq_250_2h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.2851 -0.6173  0.0142  0.6218  5.7115

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.3706    1.1707
Residual                   0.1682    0.4101
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.536238   0.270313  13.082
sexM            0.240741   0.208788   1.153
age           -0.002061   0.006412  -0.321
ms             0.073681   0.014615   5.041
freq_250_2h_90min_wth 0.003613   0.021770   0.166
freq_250_2h_90min_btw -0.254604   0.334910  -0.760

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_2h_90mn_w
sexM          -0.156
age           -0.868 -0.064
ms            -0.317 -0.036  0.080
freq_250_2h_90mn_w 0.008  0.001 -0.002 -0.028
freq_250_2h_90mn_b -0.112 -0.085  0.020 -0.001 -0.001

Robustness weights for the residuals:
3703 weights are ~= 1. The remaining 979 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.185  0.597  0.761  0.737  0.916  0.999

Robustness weights for the random effects:
136 weights are ~= 1. The remaining 25 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.388  0.678  0.777  0.744  0.862  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.54 | 0.27 | [ 3.01, 4.07] | 13.08 | < .001
sex [M] | 0.24 | 0.21 | [-0.17, 0.65] | 1.15 | 0.249
age | -2.06e-03 | 6.41e-03 | [-0.01, 0.01] | -0.32 | 0.748
ms | 0.07 | 0.01 | [ 0.05, 0.10] | 5.04 | < .001
freq 250 2h 90min wth | 3.61e-03 | 0.02 | [-0.04, 0.05] | 0.17 | 0.868
freq 250 2h 90min btw | -0.25 | 0.33 | [-0.91, 0.40] | -0.76 | 0.447

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.17
SD (Residual) | 0.41

```

=====
OUTCOME: appetite
EXPOSURE: freq_250_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2835 -0.6196 0.0137 0.6225 5.7141

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3268 1.1518
Residual 0.1682 0.4101
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.820949 0.299630 12.752
sexM 0.195290 0.205096 0.952
age -0.003585 0.006340 -0.565
ms 0.073495 0.014620 5.027
freq_250_3h_0min_wth -0.002396 0.006367 -0.376
freq_250_3h_0min_btw -0.134777 0.066062 -2.040

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_3h_0mn_w
sexM -0.176
age -0.812 -0.056
ms -0.286 -0.037 0.081
freq_250_3h_0mn_w -0.014 0.000 0.003 0.055
freq_250_3h_0mn_b -0.468 0.061 0.099 0.001 0.001

Robustness weights for the residuals:
3706 weights are ~= 1. The remaining 976 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.185 0.597 0.760 0.736 0.913 0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.390 0.674 0.752 0.762 0.853 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
(Intercept) | 3.82 | 0.30 | [3.23, 4.41] | 12.75 | < .001
sex [M] | 0.20 | 0.21 | [-0.21, 0.60] | 0.95 | 0.341
age | -3.59e-03 | 6.34e-03 | [-0.02, 0.01] | -0.57 | 0.572
ms | 0.07 | 0.01 | [0.04, 0.10] | 5.03 | < .001
freq 250 3h 0min wth | -2.40e-03 | 6.37e-03 | [-0.01, 0.01] | -0.38 | 0.707
freq 250 3h 0min btw | -0.13 | 0.07 | [-0.26, -0.01] | -2.04 | 0.041

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 1.15
SD (Residual) | 0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_250_3h | 120 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.1657 -0.6217 0.0133 0.6211 5.7131

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3734 1.172
Residual 0.1681 0.410
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.534884 0.275255 12.842
sexM 0.235308 0.208986 1.126
age -0.002165 0.006440 -0.336
ms 0.073633 0.014613 5.039
freq_250_3h_120min_wth 0.031748 0.013909 2.283
freq_250_3h_120min_btw -0.072776 0.187066 -0.389

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_3h_120mn_w
sexM -0.145
age -0.866 -0.069
ms -0.308 -0.035 0.079
freq_250_3h_120mn_w 0.008 0.001 -0.002 -0.026
freq_250_3h_120mn_b -0.215 -0.084 0.084 -0.013 0.001

Robustness weights for the residuals:
3711 weights are ~= 1. The remaining 971 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.188 0.596 0.756 0.735 0.912 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.387 0.691 0.783 0.765 0.873 0.993

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.53	0.28	[3.00, 4.07]	12.84	< .001
sex [M]	0.24	0.21	[-0.17, 0.65]	1.13	0.260
age	-2.17e-03	6.44e-03	[-0.01, 0.01]	-0.34	0.737
ms	0.07	0.01	[0.04, 0.10]	5.04	< .001
freq 250 3h 120min wth	0.03	0.01	[0.00, 0.06]	2.28	0.023
freq 250 3h 120min btw	-0.07	0.19	[-0.44, 0.29]	-0.39	0.697

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.41


```
=====
OUTCOME: appetite
EXPOSURE: freq_250_3h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.3022 -0.6182 0.0159 0.6216 5.7026

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3725 1.1715
Residual 0.1682 0.4102
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.503745 0.297873 11.763
sexM 0.223508 0.208965 1.070
age -0.002068 0.006422 -0.322
ms 0.074440 0.014615 5.094
freq_250_3h_30min_wth -0.006791 0.005682 -1.195
freq_250_3h_30min_btw 0.004668 0.055460 0.084

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_30mn_w
sexM -0.113
age -0.766 -0.059
ms -0.289 -0.037 0.080
frq_250_3h_30mn_w 0.006 0.000 -0.001 -0.024
frq_250_3h_30mn_b -0.431 -0.087 -0.045 0.003 0.000

Robustness weights for the residuals:
3709 weights are ~= 1. The remaining 973 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.184 0.598 0.758 0.736 0.914 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.385 0.684 0.780 0.761 0.863 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.50	0.30	[2.92, 4.09]	11.76	< .001
sex [M]	0.22	0.21	[-0.19, 0.63]	1.07	0.285
age	-2.07e-03	6.42e-03	[-0.01, 0.01]	-0.32	0.747
ms	0.07	0.01	[0.05, 0.10]	5.09	< .001
freq 250 3h 30min wth	-6.79e-03	5.68e-03	[-0.02, 0.00]	-1.20	0.232
freq 250 3h 30min btw	4.67e-03	0.06	[-0.10, 0.11]	0.08	0.933

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_250_3h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2664 -0.6177 0.0145 0.6229 5.7264

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3709 1.1708
Residual 0.1679 0.4097
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.504870 0.282886 12.390
sexM 0.221800 0.209305 1.060
age -0.002044 0.006412 -0.319
ms 0.074259 0.014597 5.087
freq_250_3h_60min_wth 0.010739 0.006807 1.578
freq_250_3h_60min_btw 0.008664 0.068310 0.127

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_60mn_w
sexM -0.124
age -0.833 -0.064
ms -0.302 -0.036 0.080
frq_250_3h_60mn_w -0.004 -0.001 0.001 0.013
frq_250_3h_60mn_b -0.314 -0.109 0.016 -0.001 0.000

Robustness weights for the residuals:
3708 weights are ~= 1. The remaining 974 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.185 0.596 0.759 0.735 0.914 0.999

Robustness weights for the random effects:
134 weights are ~= 1. The remaining 27 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.384 0.684 0.779 0.761 0.863 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.50	0.28	[2.95, 4.06]	12.39	< .001
sex [M]	0.22	0.21	[-0.19, 0.63]	1.06	0.289
age	-2.04e-03	6.41e-03	[-0.01, 0.01]	-0.32	0.750
ms	0.07	0.01	[0.05, 0.10]	5.09	< .001
freq 250 3h 60min wth	0.01	6.81e-03	[0.00, 0.02]	1.58	0.115
freq 250 3h 60min btw	8.66e-03	0.07	[-0.13, 0.14]	0.13	0.899

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.41

```
=====
OUTCOME: appetite
EXPOSURE: freq_250_3h | 90 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2873 -0.6176 0.0139 0.6224 5.7128

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.3739 1.1721
Residual 0.1682 0.4101
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.525625 0.277999 12.682
sexM 0.229714 0.209141 1.098
age -0.002073 0.006428 -0.322
ms 0.073766 0.014615 5.047
freq_250_3h_90min_wth 0.001214 0.008422 0.144
freq_250_3h_90min_btw -0.014726 0.097416 -0.151

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_90mn_w
sexM -0.138
age -0.856 -0.067
ms -0.306 -0.036 0.080
frq_250_3h_90mn_w -0.009 -0.001 0.002 0.028
frq_250_3h_90mn_b -0.254 -0.090 0.055 -0.007 0.001

Robustness weights for the residuals:
3706 weights are ~= 1. The remaining 976 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.185 0.597 0.761 0.736 0.915 0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.386 0.693 0.786 0.772 0.879 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.53	0.28	[2.98, 4.07]	12.68	< .001
sex [M]	0.23	0.21	[-0.18, 0.64]	1.10	0.272
age	-2.07e-03	6.43e-03	[-0.01, 0.01]	-0.32	0.747
ms	0.07	0.01	[0.05, 0.10]	5.05	< .001
freq 250 3h 90min wth	1.21e-03	8.42e-03	[-0.02, 0.02]	0.14	0.885
freq 250 3h 90min btw	-0.01	0.10	[-0.21, 0.18]	-0.15	0.880

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.17
SD (Residual)	0.41

```
=====
OUTCOME: concentration
EXPOSURE: fffreq_1 | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.6289 -0.6130 -0.0081 0.6002 7.0046

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.8963 1.3771
Residual 0.2342 0.4839
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.548328 0.552269 8.236
sexM 0.330674 0.249928 1.323
age 0.034060 0.008184 4.162
ms -0.116913 0.018911 -6.182
ra_sum_250vs1_7d 0.095148 0.056867 1.673
fffreq_1_0min_wth 0.033359 0.007368 4.527
fffreq_1_0min_btw -0.095178 0.078581 -1.211

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r_250 fffrq_1_0mn_w
sexM -0.099
age -0.759 -0.072
ms_expsc_nt -0.181 -0.043 0.070
r_sm_250l_7 -0.064 -0.005 0.001 0.076
fffrq_1_0mn_w 0.040 0.009 -0.006 -0.152 -0.311
fffrq_1_0mn_b -0.807 0.019 0.353 -0.028 -0.044 0.021

Robustness weights for the residuals:
3453 weights are ~= 1. The remaining 899 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.176 0.536 0.729 0.706 0.905 0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.389 0.559 0.732 0.725 0.912 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	4.55	0.55	[3.47, 5.63]	8.24	< .001
sex [M]	0.33	0.25	[-0.16, 0.82]	1.32	0.186
age	0.03	8.18e-03	[0.02, 0.05]	4.16	< .001
ms	-0.12	0.02	[-0.15, -0.08]	-6.18	< .001
ra_sum_250vs1_7d	0.10	0.06	[-0.02, 0.21]	1.67	0.094
fffreq_1_0min_wth	0.03	7.37e-03	[0.02, 0.05]	4.53	< .001
fffreq_1_0min_btw	-0.10	0.08	[-0.25, 0.06]	-1.21	0.226

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.48

```
=====
OUTCOME: concentration
EXPOSURE: fffreq_1 | 15 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.6222 -0.6072 -0.0090  0.6130  6.9853
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.8814   1.3716
Residual                0.2351   0.4848
Number of obs: 4352, groups: id, 156
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.948660   0.325383  12.135
sexM           0.317464   0.249197   1.274
age            0.040533   0.008293   4.888
ms            -0.110436   0.018812  -5.871
ra_sum_250vs1_7d 0.091238   0.059594   1.531
fffreq_1_15min_wth -0.033155 0.010318  -3.213
fffreq_1_15min_btw -0.069679 0.122871  -0.567
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 fffrq_1_15mn_w
sexM          -0.142
age           -0.782 -0.058
ms_expsc_nt   -0.344 -0.043  0.070
r_sm_250l_7   -0.173 -0.006 -0.007  0.069
fffrq_1_15mn_w -0.096 -0.007  0.002  0.099  0.417
fffrq_1_15mn_b -0.018 -0.048 -0.392  0.020  0.058  0.024
```

```
Robustness weights for the residuals:
3464 weights are ~= 1. The remaining 888 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.176  0.534   0.719   0.703  0.904   0.999
```

```
Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.379  0.580   0.712   0.717  0.890   0.995
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.95	0.33	[3.31, 4.59]	12.14	< .001
sex [M]	0.32	0.25	[-0.17, 0.81]	1.27	0.203
age	0.04	8.29e-03	[0.02, 0.06]	4.89	< .001
ms	-0.11	0.02	[-0.15, -0.07]	-5.87	< .001
ra_sum_250vs1_7d	0.09	0.06	[-0.03, 0.21]	1.53	0.126
fffreq_1_15min_wth	-0.03	0.01	[-0.05, -0.01]	-3.21	0.001
fffreq_1_15min_btw	-0.07	0.12	[-0.31, 0.17]	-0.57	0.571

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	0.48

```
=====
OUTCOME: concentration
EXPOSURE: fffreq_1 | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5927 -0.6115 -0.0068 0.6104 6.9983

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.8143 1.3469
Residual 0.2358 0.4855
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.740134 0.322641 11.592
sexM 0.299749 0.244465 1.226
age 0.044423 0.008265 5.375
ms -0.102335 0.018818 -5.438
ra_sum_250vs1_7d 0.198522 0.059935 3.312
fffreq_1_30min_wth 0.016043 0.014240 1.127
fffreq_1_30min_btw -0.226843 0.170277 -1.332

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_30mn_w
sexM -0.140
age -0.820 -0.077
ms_expsc_nt -0.346 -0.043 0.073
r_sm_250l_7 -0.167 -0.003 -0.010 0.069
fffrq_1_30mn_w -0.094 -0.004 0.000 0.098 0.425
fffrq_1_30mn_b 0.118 0.003 -0.422 0.013 0.063 0.024

Robustness weights for the residuals:
3463 weights are ~1. The remaining 889 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.177 0.539 0.724 0.703 0.901 0.999

Robustness weights for the random effects:
125 weights are ~1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.365 0.579 0.679 0.693 0.824 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.74	0.32	[3.11, 4.37]	11.59	< .001
sex [M]	0.30	0.24	[-0.18, 0.78]	1.23	0.220
age	0.04	8.27e-03	[0.03, 0.06]	5.37	< .001
ms	-0.10	0.02	[-0.14, -0.07]	-5.44	< .001
ra_sum_250vs1_7d	0.20	0.06	[0.08, 0.32]	3.31	< .001
fffreq_1_30min_wth	0.02	0.01	[-0.01, 0.04]	1.13	0.260
fffreq_1_30min_btw	-0.23	0.17	[-0.56, 0.11]	-1.33	0.183

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	0.49

```

=====
OUTCOME: concentration
EXPOSURE: freq_10_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.7549 -0.6119 -0.0079  0.6056  7.0880

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.923     1.3866
Residual                0.236     0.4858
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.042553   0.350479  11.534
sexM            0.331570   0.253153   1.310
age            0.037952   0.007774   4.882
ms           -0.105317   0.018884  -5.577
ra_sum_250vs10_3h_7d -0.003930  0.042947  -0.092
freq_10_3h_0min_wth  0.002321  0.010522   0.221
freq_10_3h_0min_btw -0.034987  0.110523  -0.317

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_0mn_w
sexM          -0.091
age          -0.843 -0.096
ms_expsc_nt   -0.295 -0.037  0.076
r__25010_3_   -0.034 -0.004 -0.013  0.100
frq_10_3h_0mn_w  0.016  0.003  0.001 -0.063 -0.185
frq_10_3h_0mn_b -0.381 -0.110  0.128 -0.048 -0.045  0.041

Robustness weights for the residuals:
3451 weights are ~= 1. The remaining 901 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.173  0.545   0.723   0.707  0.907   0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.385  0.590   0.721   0.727  0.930   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.04 | 0.35 | [ 3.36, 4.73] | 11.53 | < .001
sex [M] | 0.33 | 0.25 | [-0.16, 0.83] | 1.31 | 0.190
age | 0.04 | 7.77e-03 | [ 0.02, 0.05] | 4.88 | < .001
ms | -0.11 | 0.02 | [-0.14, -0.07] | -5.58 | < .001
ra_sum_250vs10_3h_7d | -3.93e-03 | 0.04 | [-0.09, 0.08] | -0.09 | 0.927
freq_10_3h_0min_wth | 2.32e-03 | 0.01 | [-0.02, 0.02] | 0.22 | 0.825
freq_10_3h_0min_btw | -0.03 | 0.11 | [-0.25, 0.18] | -0.32 | 0.752

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.39
SD (Residual) | 0.49

```

```

=====
OUTCOME: concentration
EXPOSURE: freq_10_3h | 120 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.7069 -0.6066 -0.0057  0.6061  6.9221

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      1.8637   1.3652
Residual                   0.2364   0.4862
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.935835   0.320712  12.272
sexM            0.276381   0.248860   1.111
age            0.035655   0.007683   4.641
ms           -0.100190   0.018885  -5.305
ra_sum_250vs10_3h_7d 0.021357   0.042699   0.500
freq_10_3h_120min_wth 0.038785   0.011192   3.466
freq_10_3h_120min_btw 0.190161   0.110986   1.713

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_120mn_w
sexM          -0.136
age          -0.840 -0.068
ms_expsc_nt   -0.342 -0.043  0.083
r__25010_3_   -0.058 -0.014 -0.015  0.098
frq_10_3h_120mn_w -0.029 -0.007  0.003  0.077  0.143
frq_10_3h_120mn_b -0.081 -0.094 -0.154 -0.001  0.051  0.000

Robustness weights for the residuals:
3444 weights are ~= 1. The remaining 908 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.175  0.543   0.732   0.711  0.913   0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.375  0.562   0.715   0.717  0.904   0.995

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.94 | 0.32 | [ 3.31, 4.56] | 12.27 | < .001
sex [M] | 0.28 | 0.25 | [-0.21, 0.76] | 1.11 | 0.267
age | 0.04 | 7.68e-03 | [ 0.02, 0.05] | 4.64 | < .001
ms | -0.10 | 0.02 | [-0.14, -0.06] | -5.31 | < .001
ra sum 250vs10 3h 7d | 0.02 | 0.04 | [-0.06, 0.11] | 0.50 | 0.617
freq 10 3h 120min wth | 0.04 | 0.01 | [ 0.02, 0.06] | 3.47 | < .001
freq 10 3h 120min btw | 0.19 | 0.11 | [-0.03, 0.41] | 1.71 | 0.087

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.37
SD (Residual) | 0.49

```



```

=====
OUTCOME: concentration
EXPOSURE: freq_10_3h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.7558 -0.6157 -0.0080  0.6050  7.1086

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 1.8895   1.3746
Residual                0.2358   0.4856
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.839465   0.376901  10.187
sexM            0.322363   0.249501   1.292
age            0.036947   0.007673   4.815
ms           -0.109305   0.019248  -5.679
ra_sum_250vs10_3h_7d -0.022791  0.045514  -0.501
freq_10_3h_30min_wth -0.010773  0.007658  -1.407
freq_10_3h_30min_btw  0.060739  0.057928   1.049

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_30mn_w
sexM          -0.114
age          -0.691 -0.082
ms_expsc_nt  -0.329 -0.045  0.078
r__25010_3_  -0.109 -0.013 -0.011  0.160
frq_10_3h_30mn_w -0.089 -0.013  0.007  0.206  0.371
frq_10_3h_30mn_b -0.518 -0.018 -0.087  0.061  0.083  0.039

Robustness weights for the residuals:
3458 weights are ~= 1. The remaining 894 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.173  0.538   0.722   0.704  0.904   0.999

Robustness weights for the random effects:
123 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.372  0.600   0.739   0.732  0.932   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.84 | 0.38 | [ 3.10, 4.58] | 10.19 | < .001
sex [M] | 0.32 | 0.25 | [-0.17, 0.81] | 1.29 | 0.196
age | 0.04 | 7.67e-03 | [ 0.02, 0.05] | 4.82 | < .001
ms | -0.11 | 0.02 | [-0.15, -0.07] | -5.68 | < .001
ra sum 250vs10 3h 7d | -0.02 | 0.05 | [-0.11, 0.07] | -0.50 | 0.617
freq 10 3h 30min wth | -0.01 | 7.66e-03 | [-0.03, 0.00] | -1.41 | 0.160
freq 10 3h 30min btw | 0.06 | 0.06 | [-0.05, 0.17] | 1.05 | 0.294

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.37
SD (Residual) | 0.49

```

```

=====
OUTCOME: concentration
EXPOSURE: freq_10_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.6388 -0.6071 -0.0110  0.6059  6.9502

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.8775    1.3702
Residual                   0.2369    0.4867
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.778280   0.341243  11.072
sexM            0.295419   0.248907   1.187
age            0.037019   0.007661   4.832
ms           -0.090233   0.019163  -4.709
ra_sum_250vs10_3h_7d 0.056535   0.044642   1.266
freq_10_3h_60min_wth 0.029199   0.007849   3.720
freq_10_3h_60min_btw 0.078137   0.062546   1.249

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_60mn_w
sexM          -0.121
age          -0.775 -0.079
ms_expsc_nt   -0.341 -0.045  0.079
r__25010_3_   -0.090 -0.014 -0.012  0.141
frq_10_3h_60mn_w -0.074 -0.012  0.007  0.177  0.317
frq_10_3h_60mn_b -0.336 -0.043 -0.103  0.041  0.073  0.026

Robustness weights for the residuals:
3459 weights are ~= 1. The remaining 893 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.176  0.538   0.732   0.708  0.912   0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.375  0.572   0.732   0.721  0.915   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.78 | 0.34 | [ 3.11, 4.45] | 11.07 | < .001
sex [M] | 0.30 | 0.25 | [-0.19, 0.78] | 1.19 | 0.235
age | 0.04 | 7.66e-03 | [ 0.02, 0.05] | 4.83 | < .001
ms | -0.09 | 0.02 | [-0.13, -0.05] | -4.71 | < .001
ra sum 250vs10 3h 7d | 0.06 | 0.04 | [-0.03, 0.14] | 1.27 | 0.205
freq 10 3h 60min wth | 0.03 | 7.85e-03 | [ 0.01, 0.04] | 3.72 | < .001
freq 10 3h 60min btw | 0.08 | 0.06 | [-0.04, 0.20] | 1.25 | 0.212

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.37
SD (Residual) | 0.49

```

```

=====
OUTCOME: concentration
EXPOSURE: freq_10_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.7382 -0.6029 -0.0099  0.6004  6.9330

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.8614    1.3643
Residual                   0.2364    0.4862
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.871815   0.326255  11.867
sexM            0.297268   0.247890   1.199
age            0.036548   0.007634   4.788
ms           -0.098239   0.018932  -5.189
ra_sum_250vs10_3h_7d 0.031403   0.043545   0.721
freq_10_3h_90min_wth 0.025614   0.008743   2.930
freq_10_3h_90min_btw 0.110545   0.074473   1.484

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_90mn_w
sexM          -0.131
age          -0.821 -0.078
ms_expsc_nt   -0.340 -0.044  0.082
r__25010_3_   -0.071 -0.013 -0.013  0.111
frq_10_3h_90mn_w -0.043 -0.009  0.003  0.104  0.239
frq_10_3h_90mn_b -0.200 -0.047 -0.110  0.013  0.062  0.011

Robustness weights for the residuals:
3451 weights are ~= 1. The remaining 901 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.174  0.542   0.733   0.708  0.909   0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.373  0.569   0.729   0.719  0.911   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.87 | 0.33 | [ 3.23, 4.51] | 11.87 | < .001
sex [M] | 0.30 | 0.25 | [-0.19, 0.78] | 1.20 | 0.231
age | 0.04 | 7.63e-03 | [ 0.02, 0.05] | 4.79 | < .001
ms | -0.10 | 0.02 | [-0.14, -0.06] | -5.19 | < .001
ra sum 250vs10 3h 7d | 0.03 | 0.04 | [-0.05, 0.12] | 0.72 | 0.471
freq 10 3h 90min wth | 0.03 | 8.74e-03 | [ 0.01, 0.04] | 2.93 | 0.003
freq 10 3h 90min btw | 0.11 | 0.07 | [-0.04, 0.26] | 1.48 | 0.138

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.36
SD (Residual) | 0.49

```

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_1h | 0 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.7001 -0.6265 -0.0055  0.6243  8.5394
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.8987   1.3779
Residual                   0.2415   0.4914
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.990536   0.417286   9.563
sexM            0.254892   0.246972   1.032
age            0.037658   0.007564   4.979
ms            -0.088377   0.017587  -5.025
freq_250_1h_0min_wth -0.033595  0.006607  -5.085
freq_250_1h_0min_btw -0.009985  0.066951  -0.149
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_0mn_w
sexM          -0.209
age          -0.617 -0.071
ms          -0.277 -0.031  0.079
frq_250_1h_0mn_w -0.025 -0.001  0.006  0.094
frq_250_1h_0mn_b -0.651  0.129 -0.066  0.047  0.005
```

```
Robustness weights for the residuals:
3716 weights are ~= 1. The remaining 966 ones are summarized as
    Min. 1st Qu.  Median      Mean 3rd Qu.      Max.
  0.158  0.524   0.725   0.704   0.906   0.999
```

```
Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median      Mean 3rd Qu.      Max.
  0.383  0.565   0.688   0.697   0.855   0.987
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.99	0.42	[3.17, 4.81]	9.56	< .001
sex [M]	0.25	0.25	[-0.23, 0.74]	1.03	0.302
age	0.04	7.56e-03	[0.02, 0.05]	4.98	< .001
ms	-0.09	0.02	[-0.12, -0.05]	-5.03	< .001
freq 250 1h 0min wth	-0.03	6.61e-03	[-0.05, -0.02]	-5.09	< .001
freq 250 1h 0min btw	-9.99e-03	0.07	[-0.14, 0.12]	-0.15	0.881

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.49

```

=====
OUTCOME: concentration
EXPOSURE: freq_250_1h | 15 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.5817 -0.6238 -0.0032  0.6138  8.5267

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 1.9103   1.3821
Residual                0.2422   0.4921
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.906971   0.334942  11.665
sexM            0.261560   0.247267   1.058
age            0.037861   0.007594   4.986
ms           -0.080639   0.017556  -4.593
freq_250_1h_15min_wth 0.007899   0.008957   0.882
freq_250_1h_15min_btw -0.001175   0.103201  -0.011

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_15mn_w
sexM          -0.121
age          -0.849 -0.071
ms          -0.298 -0.034  0.079
frq_250_1h_15mn_w 0.017  0.001 -0.004 -0.059
frq_250_1h_15mn_b -0.317 -0.115  0.080 -0.029  0.002

Robustness weights for the residuals:
3727 weights are ~= 1. The remaining 955 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.522  0.725  0.702  0.905  0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.385  0.569  0.685  0.699  0.860  0.984

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.91 | 0.33 | [ 3.25, 4.56] | 11.66 | < .001
sex [M] | 0.26 | 0.25 | [-0.22, 0.75] | 1.06 | 0.290
age | 0.04 | 7.59e-03 | [ 0.02, 0.05] | 4.99 | < .001
ms | -0.08 | 0.02 | [-0.12, -0.05] | -4.59 | < .001
freq 250 1h 15min wth | 7.90e-03 | 8.96e-03 | [-0.01, 0.03] | 0.88 | 0.378
freq 250 1h 15min btw | -1.18e-03 | 0.10 | [-0.20, 0.20] | -0.01 | 0.991

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.38
SD (Residual) | 0.49

```

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_1h | 30 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.5646 -0.6272 -0.0042  0.6128  8.5270
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.9140   1.383
Residual                0.2421   0.492
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.897684   0.331057  11.773
sexM           0.261394   0.245950   1.063
age            0.037926   0.007631   4.970
ms            -0.079972   0.017566  -4.553
freq_250_1h_30min_wth  0.006659   0.013527   0.492
freq_250_1h_30min_btw  0.007436   0.196622   0.038
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_30mn_w
sexM          -0.153
age           -0.864 -0.065
ms            -0.307 -0.037  0.080
frq_250_1h_30mn_w  0.023  0.003 -0.006 -0.075
frq_250_1h_30mn_b -0.278 -0.025  0.119 -0.013  0.000
```

```
Robustness weights for the residuals:
3729 weights are ~= 1. The remaining 953 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.521  0.720  0.701  0.905  0.999
```

```
Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.385  0.569  0.687  0.700  0.863  0.985
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.90	0.33	[3.25, 4.55]	11.77	< .001
sex [M]	0.26	0.25	[-0.22, 0.74]	1.06	0.288
age	0.04	7.63e-03	[0.02, 0.05]	4.97	< .001
ms	-0.08	0.02	[-0.11, -0.05]	-4.55	< .001
freq 250 1h 30min wth	6.66e-03	0.01	[-0.02, 0.03]	0.49	0.623
freq 250 1h 30min btw	7.44e-03	0.20	[-0.38, 0.39]	0.04	0.970

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.49

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_2h | 0 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
      Min       1Q   Median       3Q      Max
-7.5888 -0.6262  0.0003  0.6215  8.5114
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.8725   1.3684
Residual                   0.2424   0.4923
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.203631   0.365649  11.496
sexM            0.225821   0.244253   0.925
age            0.037528   0.007499   5.005
ms            -0.082597   0.017577  -4.699
freq_250_2h_0min_wth -0.014681  0.006676  -2.199
freq_250_2h_0min_btw -0.111411  0.068600  -1.624
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_2h_0mn_w
sexM          -0.189
age           -0.764 -0.060
ms            -0.290 -0.036  0.083
frq_250_2h_0mn_w -0.022 -0.001  0.006  0.081
frq_250_2h_0mn_b -0.508  0.092  0.028  0.016  0.002
```

```
Robustness weights for the residuals:
3732 weights are ~= 1. The remaining 950 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.519  0.718  0.700  0.905  0.999
```

```
Robustness weights for the random effects:
130 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.378  0.560  0.717  0.715  0.898  0.996
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.20	0.37	[3.49, 4.92]	11.50	< .001
sex [M]	0.23	0.24	[-0.25, 0.70]	0.92	0.355
age	0.04	7.50e-03	[0.02, 0.05]	5.00	< .001
ms	-0.08	0.02	[-0.12, -0.05]	-4.70	< .001
freq 250 2h 0min wth	-0.01	6.68e-03	[-0.03, 0.00]	-2.20	0.028
freq 250 2h 0min btw	-0.11	0.07	[-0.25, 0.02]	-1.62	0.104

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	0.49

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_2h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5619 -0.6237 -0.0086 0.6180 8.5280

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.9072 1.3810
Residual 0.2417 0.4917
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.835564 0.344158 11.145
sexM 0.248657 0.246761 1.008
age 0.038139 0.007579 5.032
ms -0.078752 0.017508 -4.498
freq_250_2h_30min_wth -0.010951 0.007390 -1.482
freq_250_2h_30min_btw 0.033349 0.080045 0.417

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_30mn_w
sexM -0.113
age -0.826 -0.069
ms -0.291 -0.035 0.080
frq_250_2h_30mn_w 0.005 0.000 -0.001 -0.020
frq_250_2h_30mn_b -0.387 -0.104 0.063 -0.017 0.000

Robustness weights for the residuals:
3734 weights are ~= 1. The remaining 948 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.158 0.520 0.720 0.698 0.899 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.383 0.567 0.684 0.699 0.863 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.84	0.34	[3.16, 4.51]	11.14	< .001
sex [M]	0.25	0.25	[-0.24, 0.73]	1.01	0.314
age	0.04	7.58e-03	[0.02, 0.05]	5.03	< .001
ms	-0.08	0.02	[-0.11, -0.04]	-4.50	< .001
freq 250 2h 30min wth	-0.01	7.39e-03	[-0.03, 0.00]	-1.48	0.138
freq 250 2h 30min btw	0.03	0.08	[-0.12, 0.19]	0.42	0.677

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.49


```
=====
OUTCOME: concentration
EXPOSURE: freq_250_2h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5628 -0.6228 -0.0046 0.6135 8.5297

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.913 1.383
Residual 0.242 0.492
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.895340 0.325303 11.975
sexM 0.260250 0.246780 1.055
age 0.037918 0.007578 5.004
ms -0.079250 0.017514 -4.525
freq_250_2h_60min_wth 0.012879 0.011386 1.131
freq_250_2h_60min_btw 0.003724 0.133308 0.028

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_60mn_w
sexM -0.143
age -0.857 -0.065
ms -0.313 -0.036 0.081
frq_250_2h_60mn_w 0.000 0.000 0.000 0.000
frq_250_2h_60mn_b -0.214 -0.090 0.031 -0.010 0.001

Robustness weights for the residuals:
3726 weights are ~= 1. The remaining 956 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.158 0.523 0.723 0.702 0.908 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.385 0.569 0.686 0.700 0.863 0.985

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.90	0.33	[3.26, 4.53]	11.97	< .001
sex [M]	0.26	0.25	[-0.22, 0.74]	1.05	0.292
age	0.04	7.58e-03	[0.02, 0.05]	5.00	< .001
ms	-0.08	0.02	[-0.11, -0.04]	-4.52	< .001
freq 250 2h 60min wth	0.01	0.01	[-0.01, 0.04]	1.13	0.258
freq 250 2h 60min btw	3.72e-03	0.13	[-0.26, 0.27]	0.03	0.978

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.49

```

=====
OUTCOME: concentration
EXPOSURE: freq_250_2h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.5656 -0.6220 -0.0082  0.6140  8.5269

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.8933    1.376
Residual                   0.2421    0.492
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.923793   0.318379  12.324
sexM            0.276034   0.245433   1.125
age             0.037843   0.007538   5.020
ms            -0.079852   0.017517  -4.558
freq_250_2h_90min_wth 0.036450   0.026117   1.396
freq_250_2h_90min_btw -0.240938   0.393665  -0.612

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_2h_90mn_w
sexM          -0.155
age           -0.867 -0.064
ms            -0.322 -0.037  0.082
frq_250_2h_90mn_w 0.008  0.001 -0.002 -0.028
frq_250_2h_90mn_b -0.112 -0.085  0.020 -0.001 -0.001

Robustness weights for the residuals:
3725 weights are ~= 1. The remaining 957 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.524  0.724  0.702  0.909  0.999

Robustness weights for the random effects:
130 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.385  0.574  0.683  0.704  0.871  0.979

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.92 | 0.32 | [ 3.30, 4.55] | 12.32 | < .001
sex [M] | 0.28 | 0.25 | [-0.21, 0.76] | 1.12 | 0.261
age | 0.04 | 7.54e-03 | [ 0.02, 0.05] | 5.02 | < .001
ms | -0.08 | 0.02 | [-0.11, -0.05] | -4.56 | < .001
freq 250 2h 90min wth | 0.04 | 0.03 | [-0.01, 0.09] | 1.40 | 0.163
freq 250 2h 90min btw | -0.24 | 0.39 | [-1.01, 0.53] | -0.61 | 0.541

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.38
SD (Residual) | 0.49

```

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_3h | 0 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.5691 -0.6272 -0.0032  0.6197  8.5277
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.8799   1.3711
Residual                   0.2424   0.4923
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.144115   0.356912  11.611
sexM            0.233542   0.244148   0.957
age            0.036915   0.007547   4.891
ms            -0.081339   0.017544  -4.636
freq_250_3h_0min_wth -0.022607  0.007643  -2.958
freq_250_3h_0min_btw -0.114242  0.078641  -1.453
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_0mn_w
sexM          -0.175
age          -0.812 -0.056
ms          -0.288 -0.037  0.082
frq_250_3h_0mn_w -0.014  0.000  0.003  0.055
frq_250_3h_0mn_b -0.468  0.061  0.099  0.001  0.001
```

```
Robustness weights for the residuals:
3733 weights are ~= 1. The remaining 949 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.519  0.719  0.700  0.906  0.999
```

```
Robustness weights for the random effects:
130 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.384  0.572  0.687  0.713  0.880  0.999
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.14	0.36	[3.44, 4.84]	11.61	< .001
sex [M]	0.23	0.24	[-0.25, 0.71]	0.96	0.339
age	0.04	7.55e-03	[0.02, 0.05]	4.89	< .001
ms	-0.08	0.02	[-0.12, -0.05]	-4.64	< .001
freq 250 3h 0min wth	-0.02	7.64e-03	[-0.04, -0.01]	-2.96	0.003
freq 250 3h 0min btw	-0.11	0.08	[-0.27, 0.04]	-1.45	0.146

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	0.49

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_3h | 120 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.5659 -0.6283 -0.0053  0.6157  8.5259
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.9122   1.3828
Residual                0.2422   0.4921
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.90025    0.32533  11.989
sexM            0.26035    0.24663   1.056
age            0.03791    0.00760   4.988
ms           -0.08068    0.01752  -4.604
freq_250_3h_120min_wth  0.05556    0.01669   3.328
freq_250_3h_120min_btw  0.01386    0.22076   0.063
```

```
Correlation of Fixed Effects:
              (Intr) sexM    age    ms_xp_ freq_250_3h_120mn_w
sexM          -0.144
age          -0.866 -0.069
ms          -0.313 -0.036  0.080
freq_250_3h_120mn_w  0.008  0.001 -0.002 -0.026
freq_250_3h_120mn_b -0.214 -0.084  0.084 -0.013  0.001
```

```
Robustness weights for the residuals:
3727 weights are ~= 1. The remaining 955 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.523   0.725   0.702  0.907   0.999
```

```
Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.385  0.569   0.686   0.700  0.863   0.985
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.90	0.33	[3.26, 4.54]	11.99	< .001
sex [M]	0.26	0.25	[-0.22, 0.74]	1.06	0.291
age	0.04	7.60e-03	[0.02, 0.05]	4.99	< .001
ms	-0.08	0.02	[-0.12, -0.05]	-4.60	< .001
freq 250 3h 120min wth	0.06	0.02	[0.02, 0.09]	3.33	< .001
freq 250 3h 120min btw	0.01	0.22	[-0.42, 0.45]	0.06	0.950

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.49

```

=====
OUTCOME: concentration
EXPOSURE: freq_250_3h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.5501 -0.6267 -0.0061  0.6124  8.5282

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 1.8799   1.3711
 Residual                0.2418   0.4917
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.713715   0.349350  10.630
sexM            0.232073   0.244609   0.949
age            -0.037858   0.007518   5.036
ms            -0.078921   0.017503  -4.509
freq_250_3h_30min_wth -0.004756   0.006812  -0.698
freq_250_3h_30min_btw  0.072973   0.064916   1.124

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_30mn_w
sexM          -0.112
age          -0.766 -0.059
ms          -0.295 -0.038  0.082
frq_250_3h_30mn_w  0.006  0.000 -0.001 -0.024
frq_250_3h_30mn_b -0.430 -0.086 -0.045  0.003  0.000

Robustness weights for the residuals:
3724 weights are ~= 1. The remaining 958 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.521  0.724  0.702  0.905  0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.377  0.574  0.682  0.699  0.842  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.71 | 0.35 | [ 3.03, 4.40] | 10.63 | < .001
sex [M] | 0.23 | 0.24 | [-0.25, 0.71] | 0.95 | 0.343
age | 0.04 | 7.52e-03 | [ 0.02, 0.05] | 5.04 | < .001
ms | -0.08 | 0.02 | [-0.11, -0.04] | -4.51 | < .001
freq 250 3h 30min wth | -4.76e-03 | 6.81e-03 | [-0.02, 0.01] | -0.70 | 0.485
freq 250 3h 30min btw | 0.07 | 0.06 | [-0.05, 0.20] | 1.12 | 0.261

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.37
SD (Residual) | 0.49

```

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_3h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.5451 -0.6193 -0.0086 0.6152 8.5283

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.9036 1.3797
Residual 0.2419 0.4918
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.801336 0.333928 11.384
sexM 0.240923 0.246678 0.977
age 0.038040 0.007558 5.033
ms -0.079643 0.017507 -4.549
freq_250_3h_60min_wth -0.010931 0.008171 -1.338
freq_250_3h_60min_btw 0.068633 0.080503 0.853

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_60mn_w
sexM -0.123
age -0.832 -0.064
ms -0.307 -0.037 0.082
frq_250_3h_60mn_w -0.004 -0.001 0.001 0.013
frq_250_3h_60mn_b -0.313 -0.109 0.016 -0.001 0.000

Robustness weights for the residuals:
3725 weights are ~= 1. The remaining 957 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.158 0.521 0.725 0.702 0.905 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.381 0.562 0.678 0.691 0.822 0.972

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.80	0.33	[3.15, 4.46]	11.38	< .001
sex [M]	0.24	0.25	[-0.24, 0.72]	0.98	0.329
age	0.04	7.56e-03	[0.02, 0.05]	5.03	< .001
ms	-0.08	0.02	[-0.11, -0.05]	-4.55	< .001
freq 250 3h 60min wth	-0.01	8.17e-03	[-0.03, 0.01]	-1.34	0.181
freq 250 3h 60min btw	0.07	0.08	[-0.09, 0.23]	0.85	0.394

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.49

```
=====
OUTCOME: concentration
EXPOSURE: freq_250_3h | 90 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.5547 -0.6227 -0.0067  0.6149  8.5296
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.9130  1.3831
Residual                0.2419  0.4919
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.877741   0.328556  11.802
sexM            0.256291   0.246818   1.038
age            0.037994   0.007587   5.008
ms           -0.079595   0.017516  -4.544
freq_250_3h_90min_wth -0.006711  0.010101  -0.664
freq_250_3h_90min_btw  0.027488   0.114962   0.239
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_90mn_w
sexM          -0.138
age          -0.855 -0.067
ms          -0.310 -0.036  0.081
frq_250_3h_90mn_w -0.009 -0.001  0.002  0.028
frq_250_3h_90mn_b -0.254 -0.090  0.055 -0.008  0.001
```

```
Robustness weights for the residuals:
3725 weights are ~= 1. The remaining 957 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.158  0.521  0.724  0.702  0.904  0.999
```

```
Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.383  0.568  0.688  0.700  0.868  0.990
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.88	0.33	[3.23, 4.52]	11.80	< .001
sex [M]	0.26	0.25	[-0.23, 0.74]	1.04	0.299
age	0.04	7.59e-03	[0.02, 0.05]	5.01	< .001
ms	-0.08	0.02	[-0.11, -0.05]	-4.54	< .001
freq 250 3h 90min wth	-6.71e-03	0.01	[-0.03, 0.01]	-0.66	0.506
freq 250 3h 90min btw	0.03	0.11	[-0.20, 0.25]	0.24	0.811

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.38
SD (Residual)	0.49

```
=====
OUTCOME: energy
EXPOSURE: fffreq_1 | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.3935 -0.6196 0.0286 0.6010 8.0765

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.5660 1.2514
Residual 0.2242 0.4735
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.470932 0.503482 8.880
sexM 0.505828 0.227273 2.226
age 0.028021 0.007444 3.764
ms -0.061025 0.018434 -3.310
ra_sum_250vs1_7d 0.180527 0.055605 3.247
fffreq_1_0min_wth 0.023578 0.007209 3.271
fffreq_1_0min_btw -0.103100 0.071464 -1.443

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r_250 fffrq_1_0mn_w
sexM -0.098
age -0.759 -0.072
ms_expsc_nt -0.194 -0.046 0.075
r_sm_250l_7 -0.068 -0.005 0.001 0.077
fffrq_1_0mn_w 0.042 0.010 -0.007 -0.151 -0.311
fffrq_1_0mn_b -0.803 0.019 0.352 -0.030 -0.047 0.022

Robustness weights for the residuals:
3446 weights are ~= 1. The remaining 906 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.167 0.560 0.748 0.718 0.910 0.999

Robustness weights for the random effects:
122 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.407 0.632 0.765 0.757 0.893 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	4.47	0.50	[3.48, 5.46]	8.88	< .001
sex [M]	0.51	0.23	[0.06, 0.95]	2.23	0.026
age	0.03	7.44e-03	[0.01, 0.04]	3.76	< .001
ms	-0.06	0.02	[-0.10, -0.02]	-3.31	< .001
ra_sum_250vs1_7d	0.18	0.06	[0.07, 0.29]	3.25	0.001
fffreq_1_0min_wth	0.02	7.21e-03	[0.01, 0.04]	3.27	0.001
fffreq_1_0min_btw	-0.10	0.07	[-0.24, 0.04]	-1.44	0.149

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.25
SD (Residual)	0.47


```
=====
OUTCOME: energy
EXPOSURE: fffreq_1 | 15 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.4790 -0.6214 0.0322 0.6062 8.0380

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.5272 1.2358
Residual 0.2229 0.4721
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.951512 0.296615 13.322
sexM 0.465615 0.224679 2.072
age 0.035168 0.007479 4.702
ms -0.063529 0.018247 -3.482
ra_sum_250vs1_7d 0.130681 0.057996 2.253
fffreq_1_15min_wth -0.042688 0.010047 -4.249
fffreq_1_15min_btw -0.116980 0.110796 -1.056

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_15mn_w
sexM -0.138
age -0.776 -0.058
ms_expsc_nt -0.367 -0.046 0.076
r_sm_250l_7 -0.185 -0.007 -0.007 0.070
fffrq_1_15mn_w -0.102 -0.007 0.002 0.099 0.416
fffrq_1_15mn_b -0.020 -0.049 -0.392 0.022 0.062 0.026

Robustness weights for the residuals:
3455 weights are ~= 1. The remaining 897 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.167 0.555 0.748 0.714 0.904 0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.388 0.592 0.701 0.728 0.899 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.95	0.30	[3.37, 4.53]	13.32	< .001
sex [M]	0.47	0.22	[0.03, 0.91]	2.07	0.038
age	0.04	7.48e-03	[0.02, 0.05]	4.70	< .001
ms	-0.06	0.02	[-0.10, -0.03]	-3.48	< .001
ra_sum_250vs1_7d	0.13	0.06	[0.02, 0.24]	2.25	0.024
fffreq_1_15min_wth	-0.04	0.01	[-0.06, -0.02]	-4.25	< .001
fffreq_1_15min_btw	-0.12	0.11	[-0.33, 0.10]	-1.06	0.291

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.24
SD (Residual)	0.47

```
=====
OUTCOME: energy
EXPOSURE: fffreq_1 | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.3310 -0.6137 0.0298 0.6082 8.0313

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.5028 1.2259
Residual 0.2239 0.4732
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.791865 0.296644 12.783
sexM 0.454202 0.222635 2.040
age 0.037383 0.007529 4.965
ms -0.057269 0.018273 -3.134
ra_sum_250vs1_7d 0.189295 0.058380 3.242
fffreq_1_30min_wth -0.021515 0.013876 -1.550
fffreq_1_30min_btw -0.221350 0.155091 -1.427

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_30mn_w
sexM -0.137
age -0.815 -0.077
ms_expsc_nt -0.365 -0.045 0.078
r_sm_250l_7 -0.177 -0.003 -0.011 0.070
fffrq_1_30mn_w -0.100 -0.005 0.000 0.098 0.425
fffrq_1_30mn_b 0.115 0.003 -0.422 0.014 0.067 0.025

Robustness weights for the residuals:
3452 weights are ~= 1. The remaining 900 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.167 0.553 0.747 0.715 0.914 0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.393 0.573 0.700 0.720 0.872 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.79	0.30	[3.21, 4.37]	12.78	< .001
sex [M]	0.45	0.22	[0.02, 0.89]	2.04	0.041
age	0.04	7.53e-03	[0.02, 0.05]	4.97	< .001
ms	-0.06	0.02	[-0.09, -0.02]	-3.13	0.002
ra_sum_250vs1_7d	0.19	0.06	[0.07, 0.30]	3.24	0.001
fffreq_1_30min_wth	-0.02	0.01	[-0.05, 0.01]	-1.55	0.121
fffreq_1_30min_btw	-0.22	0.16	[-0.53, 0.08]	-1.43	0.154

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.23
SD (Residual)	0.47

```

=====
OUTCOME: energy
EXPOSURE: freq_10_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-7.2627 -0.6137  0.0253  0.6119  8.1971

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.5787    1.2565
Residual                   0.2254    0.4747
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.024146   0.319878  12.580
sexM            0.479320   0.229546   2.088
age             0.031197   0.007051   4.425
ms            -0.051025   0.018386  -2.775
ra_sum_250vs10_3h_7d 0.081125   0.041913   1.936
freq_10_3h_0min_wth -0.009794   0.010282  -0.953
freq_10_3h_0min_btw -0.041790   0.100320  -0.417

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_0mn_w
sexM          -0.089
age          -0.841 -0.097
ms_expssc_nt -0.315 -0.039  0.081
r__25010_3_   -0.037 -0.004 -0.014  0.101
frq_10_3h_0mn_w 0.017  0.003  0.001 -0.063 -0.185
frq_10_3h_0mn_b -0.376 -0.110  0.128 -0.051 -0.048  0.044

Robustness weights for the residuals:
3449 weights are ~= 1. The remaining 903 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.164  0.557   0.747   0.717  0.908   0.999

Robustness weights for the random effects:
121 weights are ~= 1. The remaining 35 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.403  0.622   0.750   0.763  0.945   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.02 | 0.32 | [ 3.40, 4.65] | 12.58 | < .001
sex [M] | 0.48 | 0.23 | [ 0.03, 0.93] | 2.09 | 0.037
age | 0.03 | 7.05e-03 | [ 0.02, 0.05] | 4.42 | < .001
ms | -0.05 | 0.02 | [-0.09, -0.01] | -2.78 | 0.006
ra sum 250vs10 3h 7d | 0.08 | 0.04 | [ 0.00, 0.16] | 1.94 | 0.053
freq 10 3h 0min wth | -9.79e-03 | 0.01 | [-0.03, 0.01] | -0.95 | 0.341
freq 10 3h 0min btw | -0.04 | 0.10 | [-0.24, 0.15] | -0.42 | 0.677

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.26
SD (Residual) | 0.47

```

```
=====
OUTCOME: energy
EXPOSURE: freq_10_3h | 120 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-7.2292 -0.6083 0.0320 0.6118 8.0133

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.5587 1.2485
Residual 0.2254 0.4747
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.923231 0.295704 13.267
sexM 0.427002 0.227729 1.875
age 0.030024 0.007033 4.269
ms -0.046831 0.018375 -2.549
ra_sum_250vs10_3h_7d 0.097270 0.041643 2.336
freq_10_3h_120min_wth 0.041662 0.010926 3.813
freq_10_3h_120min_btw 0.123492 0.101563 1.216

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_120mn_w
sexM -0.133
age -0.837 -0.068
ms_expsc_nt -0.361 -0.045 0.088
r__25010_3_ -0.062 -0.014 -0.016 0.099
frq_10_3h_120mn_w -0.031 -0.007 0.003 0.077 0.143
frq_10_3h_120mn_b -0.080 -0.094 -0.154 -0.001 0.055 0.000

Robustness weights for the residuals:
3450 weights are ~= 1. The remaining 902 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.168 0.554 0.743 0.718 0.910 0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.386 0.584 0.696 0.714 0.879 0.966

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.92	0.30	[3.34, 4.50]	13.27	< .001
sex [M]	0.43	0.23	[-0.02, 0.87]	1.88	0.061
age	0.03	7.03e-03	[0.02, 0.04]	4.27	< .001
ms	-0.05	0.02	[-0.08, -0.01]	-2.55	0.011
ra_sum_250vs10_3h_7d	0.10	0.04	[0.02, 0.18]	2.34	0.020
freq_10_3h_120min_wth	0.04	0.01	[0.02, 0.06]	3.81	< .001
freq_10_3h_120min_btw	0.12	0.10	[-0.08, 0.32]	1.22	0.224

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.25
SD (Residual)	0.47

```

=====
OUTCOME: energy
EXPOSURE: freq_10_3h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.3055 -0.6109  0.0297  0.6138  8.2148

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.5632    1.2503
Residual                   0.2251    0.4744
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.829591   0.345780  11.075
sexM            0.471591   0.227090   2.077
age            0.030690   0.006986   4.393
ms           -0.056456   0.018742  -3.012
ra_sum_250vs10_3h_7d 0.052919   0.044428   1.191
freq_10_3h_30min_wth -0.010860   0.007481  -1.452
freq_10_3h_30min_btw  0.055700   0.052754   1.056

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_30mn_w
sexM          -0.110
age          -0.689 -0.082
ms_expsc_nt  -0.349 -0.048  0.083
r__25010_3_   -0.116 -0.014 -0.011  0.161
frq_10_3h_30mn_w -0.095 -0.014  0.007  0.205  0.371
frq_10_3h_30mn_b -0.517 -0.018 -0.087  0.065  0.089  0.042

Robustness weights for the residuals:
3465 weights are ~= 1. The remaining 887 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.164  0.552   0.741   0.712  0.897   0.999

Robustness weights for the random effects:
123 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.406  0.632   0.745   0.750  0.945   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.83 | 0.35 | [ 3.15, 4.51] | 11.08 | < .001
sex [M] | 0.47 | 0.23 | [ 0.03, 0.92] | 2.08 | 0.038
age | 0.03 | 6.99e-03 | [ 0.02, 0.04] | 4.39 | < .001
ms | -0.06 | 0.02 | [-0.09, -0.02] | -3.01 | 0.003
ra sum 250vs10 3h 7d | 0.05 | 0.04 | [-0.03, 0.14] | 1.19 | 0.234
freq 10 3h 30min wth | -0.01 | 7.48e-03 | [-0.03, 0.00] | -1.45 | 0.147
freq 10 3h 30min btw | 0.06 | 0.05 | [-0.05, 0.16] | 1.06 | 0.291

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.25
SD (Residual) | 0.47

```

```

=====
OUTCOME: energy
EXPOSURE: freq_10_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.2342 -0.6071  0.0262  0.6090  8.0416

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.5614    1.2495
Residual                   0.2253    0.4747
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.798366   0.313828  12.103
sexM            0.442790   0.227130   1.950
age            0.030877   0.006993   4.416
ms           -0.040345   0.018627  -2.166
ra_sum_250vs10_3h_7d 0.122228   0.043498   2.810
freq_10_3h_60min_wth 0.024643   0.007655   3.219
freq_10_3h_60min_btw 0.060743   0.057087   1.064

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_60mn_w
sexM          -0.118
age          -0.772 -0.079
ms_expsc_nt   -0.360 -0.048  0.084
r__25010_3_   -0.095 -0.015 -0.013  0.141
frq_10_3h_60mn_w -0.078 -0.013  0.007  0.176  0.317
frq_10_3h_60mn_b -0.336 -0.043 -0.103  0.043  0.078  0.027

Robustness weights for the residuals:
3452 weights are ~= 1. The remaining 900 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.167  0.553   0.741   0.717  0.918   0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.402  0.590   0.734   0.741  0.951   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.80 | 0.31 | [ 3.18, 4.41] | 12.10 | < .001
sex [M] | 0.44 | 0.23 | [ 0.00, 0.89] | 1.95 | 0.051
age | 0.03 | 6.99e-03 | [ 0.02, 0.04] | 4.42 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -2.17 | 0.030
ra sum 250vs10 3h 7d | 0.12 | 0.04 | [ 0.04, 0.21] | 2.81 | 0.005
freq 10 3h 60min wth | 0.02 | 7.65e-03 | [ 0.01, 0.04] | 3.22 | 0.001
freq 10 3h 60min btw | 0.06 | 0.06 | [-0.05, 0.17] | 1.06 | 0.287

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.25
SD (Residual) | 0.47

```

```

=====
OUTCOME: energy
EXPOSURE: freq_10_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-7.2482 -0.6092  0.0261  0.6120  8.0268

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.5565    1.2476
Residual                   0.2248    0.4741
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.870876   0.300720  12.872
sexM            0.440118   0.226817   1.940
age            0.030564   0.006987   4.375
ms           -0.045208   0.018398  -2.457
ra_sum_250vs10_3h_7d 0.110788   0.042414   2.612
freq_10_3h_90min_wth 0.028598   0.008524   3.355
freq_10_3h_90min_btw 0.078582   0.068145   1.153

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_90mn_w
sexM          -0.129
age          -0.818 -0.078
ms_expsc_nt  -0.359 -0.046  0.087
r__25010_3_   -0.075 -0.013 -0.014  0.111
frq_10_3h_90mn_w -0.045 -0.009  0.004  0.104  0.239
frq_10_3h_90mn_b -0.200 -0.047 -0.110  0.014  0.066  0.012

Robustness weights for the residuals:
3452 weights are ~= 1. The remaining 900 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.168  0.548   0.747   0.716  0.912   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.387  0.586   0.704   0.723  0.919   0.991

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.87 | 0.30 | [ 3.28, 4.46] | 12.87 | < .001
sex [M] | 0.44 | 0.23 | [ 0.00, 0.88] | 1.94 | 0.052
age | 0.03 | 6.99e-03 | [ 0.02, 0.04] | 4.37 | < .001
ms | -0.05 | 0.02 | [-0.08, -0.01] | -2.46 | 0.014
ra sum 250vs10 3h 7d | 0.11 | 0.04 | [ 0.03, 0.19] | 2.61 | 0.009
freq 10 3h 90min wth | 0.03 | 8.52e-03 | [ 0.01, 0.05] | 3.36 | < .001
freq 10 3h 90min btw | 0.08 | 0.07 | [-0.06, 0.21] | 1.15 | 0.249

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.25
SD (Residual) | 0.47

```

```
=====
OUTCOME: energy
EXPOSURE: freq_250_1h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1022 -0.6182 0.0232 0.6227 6.9721

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.6075 1.2679
Residual 0.2349 0.4846
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.866706 0.386161 10.013
sexM 0.438471 0.227370 1.928
age 0.029168 0.006966 4.187
ms -0.013962 0.017289 -0.808
freq_250_1h_0min_wth -0.023437 0.006515 -3.597
freq_250_1h_0min_btw 0.010515 0.061641 0.171

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_1h_0mn_w
sexM -0.207
age -0.616 -0.071
ms -0.294 -0.033 0.084
freq_250_1h_0mn_w -0.027 -0.002 0.007 0.093
freq_250_1h_0mn_b -0.649 0.129 -0.066 0.050 0.005

Robustness weights for the residuals:
3702 weights are ~= 1. The remaining 980 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.166 0.559 0.759 0.721 0.909 0.999

Robustness weights for the random effects:
130 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.400 0.594 0.707 0.733 0.867 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.87	0.39	[3.11, 4.62]	10.01	< .001
sex [M]	0.44	0.23	[-0.01, 0.88]	1.93	0.054
age	0.03	6.97e-03	[0.02, 0.04]	4.19	< .001
ms	-0.01	0.02	[-0.05, 0.02]	-0.81	0.419
freq 250 1h 0min wth	-0.02	6.52e-03	[-0.04, -0.01]	-3.60	< .001
freq 250 1h 0min btw	0.01	0.06	[-0.11, 0.13]	0.17	0.865

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.27
SD (Residual)	0.48


```

=====
OUTCOME: energy
EXPOSURE: freq_250_1h | 15 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1834 -0.6129  0.0215  0.6273  6.9480

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 1.6084   1.2682
 Residual                0.2349   0.4847
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.927453   0.309438  12.692
sexM            0.445667   0.227022   1.963
age             0.029125   0.006974   4.176
ms            -0.009503   0.017233  -0.551
freq_250_1h_15min_wth 0.017236   0.008821   1.954
freq_250_1h_15min_btw -0.040200   0.094746  -0.424

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_15mn_w
sexM          -0.118
age           -0.846 -0.072
ms            -0.316 -0.036  0.085
frq_250_1h_15mn_w 0.018  0.001 -0.005 -0.059
frq_250_1h_15mn_b -0.314 -0.115  0.080 -0.031  0.002

Robustness weights for the residuals:
3699 weights are ~= 1. The remaining 983 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.164  0.561  0.754  0.721  0.912  0.998

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.403  0.596  0.739  0.741  0.895  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.93 | 0.31 | [ 3.32, 4.53] | 12.69 | < .001
sex [M] | 0.45 | 0.23 | [ 0.00, 0.89] | 1.96 | 0.050
age | 0.03 | 6.97e-03 | [ 0.02, 0.04] | 4.18 | < .001
ms | -9.50e-03 | 0.02 | [-0.04, 0.02] | -0.55 | 0.581
freq 250 1h 15min wth | 0.02 | 8.82e-03 | [ 0.00, 0.03] | 1.95 | 0.051
freq 250 1h 15min btw | -0.04 | 0.09 | [-0.23, 0.15] | -0.42 | 0.671

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.27
SD (Residual) | 0.48

```

```
=====
OUTCOME: energy
EXPOSURE: freq_250_1h | 30 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.1264 -0.6105  0.0260  0.6239  6.9593
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.5975  1.2639
Residual                0.2342  0.4839
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.947203   0.304730  12.953
sexM            0.438587   0.224834   1.951
age            0.028742   0.006978   4.119
ms           -0.012258   0.017216  -0.712
freq_250_1h_30min_wth 0.059115   0.013303   4.444
freq_250_1h_30min_btw -0.088658   0.179701  -0.493
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_30mn_w
sexM          -0.150
age          -0.861 -0.066
ms          -0.327 -0.040  0.085
frq_250_1h_30mn_w  0.024  0.003 -0.006 -0.075
frq_250_1h_30mn_b -0.276 -0.025  0.118 -0.014  0.000
```

```
Robustness weights for the residuals:
3686 weights are ~= 1. The remaining 996 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.166  0.567  0.762  0.724  0.917  0.999
```

```
Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.401  0.592  0.697  0.720  0.842  0.974
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.95	0.30	[3.35, 4.54]	12.95	< .001
sex [M]	0.44	0.22	[0.00, 0.88]	1.95	0.051
age	0.03	6.98e-03	[0.02, 0.04]	4.12	< .001
ms	-0.01	0.02	[-0.05, 0.02]	-0.71	0.477
freq 250 1h 30min wth	0.06	0.01	[0.03, 0.09]	4.44	< .001
freq 250 1h 30min btw	-0.09	0.18	[-0.44, 0.26]	-0.49	0.622

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.26
SD (Residual)	0.48

```
=====
OUTCOME: energy
EXPOSURE: freq_250_2h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1860 -0.6182 0.0191 0.6304 6.9269

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.5816 1.2576
Residual 0.2355 0.4853
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.048456 0.338168 11.972
sexM 0.408742 0.224607 1.820
age 0.029488 0.006898 4.275
ms -0.009623 0.017267 -0.557
freq_250_2h_0min_wth -0.010660 0.006581 -1.620
freq_250_2h_0min_btw -0.067619 0.063080 -1.072

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_0mn_w
sexM -0.187
age -0.762 -0.060
ms -0.308 -0.038 0.089
frq_250_2h_0mn_w -0.024 -0.001 0.006 0.081
frq_250_2h_0mn_b -0.506 0.092 0.028 0.017 0.002

Robustness weights for the residuals:
3698 weights are ~= 1. The remaining 984 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.564 0.758 0.722 0.910 0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 34 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.396 0.628 0.759 0.749 0.919 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.05	0.34	[3.39, 4.71]	11.97	< .001
sex [M]	0.41	0.22	[-0.03, 0.85]	1.82	0.069
age	0.03	6.90e-03	[0.02, 0.04]	4.27	< .001
ms	-9.62e-03	0.02	[-0.04, 0.02]	-0.56	0.577
freq 250 2h 0min wth	-0.01	6.58e-03	[-0.02, 0.00]	-1.62	0.105
freq 250 2h 0min btw	-0.07	0.06	[-0.19, 0.06]	-1.07	0.284

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.26
SD (Residual)	0.49

```

=====
OUTCOME: energy
EXPOSURE: freq_250_2h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1451 -0.6138  0.0222  0.6265  6.9479

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.6052    1.2670
Residual                   0.2348    0.4845
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.861642   0.317831  12.150
sexM            0.425965   0.226520   1.880
age            0.029435   0.006959   4.230
ms           -0.008259   0.017195  -0.480
freq_250_2h_30min_wth 0.015299   0.007283   2.101
freq_250_2h_30min_btw 0.008752   0.073468   0.119

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_2h_30mn_w
sexM          -0.110
age          -0.824 -0.069
ms          -0.310 -0.038  0.086
frq_250_2h_30mn_w 0.006  0.000 -0.001 -0.020
frq_250_2h_30mn_b -0.384 -0.103  0.063 -0.018  0.000

Robustness weights for the residuals:
3701 weights are ~= 1. The remaining 981 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.561  0.753  0.720  0.911  0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.398  0.598  0.733  0.739  0.892  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.86 | 0.32 | [ 3.24, 4.48] | 12.15 | < .001
sex [M] | 0.43 | 0.23 | [-0.02, 0.87] | 1.88 | 0.060
age | 0.03 | 6.96e-03 | [ 0.02, 0.04] | 4.23 | < .001
ms | -8.26e-03 | 0.02 | [-0.04, 0.03] | -0.48 | 0.631
freq 250 2h 30min wth | 0.02 | 7.28e-03 | [ 0.00, 0.03] | 2.10 | 0.036
freq 250 2h 30min btw | 8.75e-03 | 0.07 | [-0.14, 0.15] | 0.12 | 0.905

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.27
SD (Residual) | 0.48

```

```
=====
OUTCOME: energy
EXPOSURE: freq_250_2h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1131 -0.6112 0.0255 0.6267 6.9564

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.6043 1.2666
Residual 0.2344 0.4842
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.904880 0.300198 13.008
sexM 0.441488 0.226152 1.952
age 0.029247 0.006947 4.210
ms -0.007678 0.017178 -0.447
freq_250_2h_60min_wth 0.033394 0.011206 2.980
freq_250_2h_60min_btw -0.053408 0.122148 -0.437

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_60mn_w
sexM -0.140
age -0.854 -0.066
ms -0.333 -0.039 0.087
frq_250_2h_60mn_w 0.000 0.000 0.000 0.000
frq_250_2h_60mn_b -0.212 -0.090 0.031 -0.011 0.001

Robustness weights for the residuals:
3690 weights are ~= 1. The remaining 992 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.166 0.564 0.765 0.723 0.914 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.401 0.593 0.701 0.721 0.844 0.969

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.90	0.30	[3.32, 4.49]	13.01	< .001
sex [M]	0.44	0.23	[0.00, 0.88]	1.95	0.051
age	0.03	6.95e-03	[0.02, 0.04]	4.21	< .001
ms	-7.68e-03	0.02	[-0.04, 0.03]	-0.45	0.655
freq 250 2h 60min wth	0.03	0.01	[0.01, 0.06]	2.98	0.003
freq 250 2h 60min btw	-0.05	0.12	[-0.29, 0.19]	-0.44	0.662

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.27
SD (Residual)	0.48

```

=====
OUTCOME: energy
EXPOSURE: freq_250_2h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-8.2090 -0.6146  0.0235  0.6283  6.9504

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.5834    1.2583
Residual                   0.2345    0.4842
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.921190   0.293540  13.358
sexM            0.456394   0.224584   2.032
age            0.028999   0.006900   4.203
ms           -0.009075   0.017178  -0.528
freq_250_2h_90min_wth 0.089353   0.025702   3.477
freq_250_2h_90min_btw -0.355681   0.360129  -0.988

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_2h_90mn_w
sexM          -0.152
age          -0.864 -0.065
ms          -0.343 -0.040  0.088
frq_250_2h_90mn_w 0.009  0.001 -0.002 -0.028
frq_250_2h_90mn_b -0.111 -0.085  0.020 -0.001 -0.001

Robustness weights for the residuals:
3685 weights are ~= 1. The remaining 997 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.164  0.563  0.764  0.725  0.920  0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.401  0.592  0.715  0.741  0.913  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.92 | 0.29 | [ 3.35, 4.50] | 13.36 | < .001
sex [M] | 0.46 | 0.22 | [ 0.02, 0.90] | 2.03 | 0.042
age | 0.03 | 6.90e-03 | [ 0.02, 0.04] | 4.20 | < .001
ms | -9.08e-03 | 0.02 | [-0.04, 0.02] | -0.53 | 0.597
freq 250 2h 90min wth | 0.09 | 0.03 | [ 0.04, 0.14] | 3.48 | < .001
freq 250 2h 90min btw | -0.36 | 0.36 | [-1.06, 0.35] | -0.99 | 0.323

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.26
SD (Residual) | 0.48

```

```
=====
OUTCOME: energy
EXPOSURE: freq_250_3h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1678 -0.6117 0.0223 0.6220 6.9342

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.5842 1.2587
Residual 0.2361 0.4859
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.048743 0.329779 12.277
sexM 0.411459 0.224265 1.835
age 0.028996 0.006935 4.181
ms -0.008799 0.017256 -0.510
freq_250_3h_0min_wth -0.023265 0.007544 -3.084
freq_250_3h_0min_btw -0.089109 0.072238 -1.234

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_0mn_w
sexM -0.173
age -0.810 -0.057
ms -0.307 -0.040 0.088
frq_250_3h_0mn_w -0.015 0.000 0.003 0.055
frq_250_3h_0mn_b -0.465 0.061 0.099 0.002 0.001

Robustness weights for the residuals:
3703 weights are ~= 1. The remaining 979 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.561 0.755 0.721 0.905 0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.397 0.632 0.745 0.743 0.905 0.996

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.05	0.33	[3.40, 4.70]	12.28	< .001
sex [M]	0.41	0.22	[-0.03, 0.85]	1.83	0.067
age	0.03	6.93e-03	[0.02, 0.04]	4.18	< .001
ms	-8.80e-03	0.02	[-0.04, 0.03]	-0.51	0.610
freq 250 3h 0min wth	-0.02	7.54e-03	[-0.04, -0.01]	-3.08	0.002
freq 250 3h 0min btw	-0.09	0.07	[-0.23, 0.05]	-1.23	0.217

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.26
SD (Residual)	0.49

```

=====
OUTCOME: energy
EXPOSURE: freq_250_3h | 120 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.0902 -0.6198  0.0206  0.6278  6.9647

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.5988   1.2644
Residual                0.2336   0.4833
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.923056   0.299722  13.089
sexM            0.443635   0.225647   1.966
age            0.028934   0.006956   4.160
ms           -0.009708   0.017154  -0.566
freq_250_3h_120min_wth  0.082652   0.016394   5.041
freq_250_3h_120min_btw -0.102469   0.201976  -0.507

Correlation of Fixed Effects:
              (Intr) sexM    age    ms_xp_ freq_250_3h_120mn_w
sexM          -0.141
age          -0.863 -0.070
ms          -0.332 -0.039  0.086
freq_250_3h_120mn_w  0.008  0.001 -0.002 -0.026
freq_250_3h_120mn_b -0.212 -0.084  0.084 -0.014  0.001

Robustness weights for the residuals:
3678 weights are ~= 1. The remaining 1004 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.166  0.569  0.767  0.726  0.920  0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.400  0.592  0.697  0.720  0.843  0.973

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.92 | 0.30 | [ 3.34, 4.51] | 13.09 | < .001
sex [M] | 0.44 | 0.23 | [ 0.00, 0.89] | 1.97 | 0.049
age | 0.03 | 6.96e-03 | [ 0.02, 0.04] | 4.16 | < .001
ms | -9.71e-03 | 0.02 | [-0.04, 0.02] | -0.57 | 0.571
freq 250 3h 120min wth | 0.08 | 0.02 | [ 0.05, 0.11] | 5.04 | < .001
freq 250 3h 120min btw | -0.10 | 0.20 | [-0.50, 0.29] | -0.51 | 0.612

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.26
SD (Residual) | 0.48

```



```
=====
OUTCOME: energy
EXPOSURE: freq_250_3h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.1680 -0.6140 0.0210 0.6273 6.9390

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.5805 1.257
Residual 0.2352 0.485
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.707675 0.322536 11.495
sexM 0.396726 0.224423 1.768
age 0.029555 0.006899 4.284
ms -0.007991 0.017202 -0.465
freq_250_3h_30min_wth 0.007650 0.006719 1.139
freq_250_3h_30min_btw 0.064839 0.059548 1.089

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_30mn_w
sexM -0.110
age -0.764 -0.059
ms -0.314 -0.040 0.088
frq_250_3h_30mn_w 0.007 0.000 -0.001 -0.024
frq_250_3h_30mn_b -0.428 -0.086 -0.045 0.003 0.000

Robustness weights for the residuals:
3706 weights are ~= 1. The remaining 976 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.165 0.561 0.752 0.719 0.903 0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.386 0.601 0.730 0.736 0.909 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.71	0.32	[3.08, 4.34]	11.50	< .001
sex [M]	0.40	0.22	[-0.04, 0.84]	1.77	0.077
age	0.03	6.90e-03	[0.02, 0.04]	4.28	< .001
ms	-7.99e-03	0.02	[-0.04, 0.03]	-0.46	0.642
freq 250 3h 30min wth	7.65e-03	6.72e-03	[-0.01, 0.02]	1.14	0.255
freq 250 3h 30min btw	0.06	0.06	[-0.05, 0.18]	1.09	0.276

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.26
SD (Residual)	0.48

```

=====
OUTCOME: energy
EXPOSURE: freq_250_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-8.1669 -0.6126  0.0232  0.6300  6.9398

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.6052    1.2669
Residual                   0.2351    0.4849
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.840096   0.308848  12.434
sexM            0.420572   0.226653   1.856
age             0.029464   0.006946   4.242
ms            -0.007081   0.017201  -0.412
freq_250_3h_60min_wth 0.007339   0.008055   0.911
freq_250_3h_60min_btw 0.021673   0.073954   0.293

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_60mn_w
sexM          -0.121
age           -0.830 -0.065
ms            -0.326 -0.039  0.087
frq_250_3h_60mn_w -0.004 -0.001  0.001  0.013
frq_250_3h_60mn_b -0.311 -0.109  0.016 -0.001  0.000

Robustness weights for the residuals:
3698 weights are ~= 1. The remaining 984 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.165  0.562  0.755  0.721  0.911  0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.397  0.599  0.733  0.738  0.893  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 3.84 | 0.31 | [ 3.23, 4.45] | 12.43 | < .001
sex [M] | 0.42 | 0.23 | [-0.02, 0.86] | 1.86 | 0.064
age | 0.03 | 6.95e-03 | [ 0.02, 0.04] | 4.24 | < .001
ms | -7.08e-03 | 0.02 | [-0.04, 0.03] | -0.41 | 0.681
freq 250 3h 60min wth | 7.34e-03 | 8.06e-03 | [-0.01, 0.02] | 0.91 | 0.362
freq 250 3h 60min btw | 0.02 | 0.07 | [-0.12, 0.17] | 0.29 | 0.769

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.27
SD (Residual) | 0.48

```

```
=====
OUTCOME: energy
EXPOSURE: freq_250_3h | 90 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-8.2146 -0.6108 0.0200 0.6285 6.9535

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.6112 1.2693
Residual 0.2341 0.4838
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.895279 0.303698 12.826
sexM 0.438650 0.226646 1.935
age 0.029267 0.006969 4.200
ms -0.006697 0.017173 -0.390
freq_250_3h_90min_wth 0.026604 0.009935 2.678
freq_250_3h_90min_btw -0.033965 0.105551 -0.322

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_90mn_w
sexM -0.135
age -0.853 -0.068
ms -0.329 -0.039 0.086
frq_250_3h_90mn_w -0.009 -0.001 0.003 0.027
frq_250_3h_90mn_b -0.252 -0.090 0.055 -0.008 0.001

Robustness weights for the residuals:
3694 weights are ~= 1. The remaining 988 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.164 0.557 0.762 0.721 0.910 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.400 0.594 0.703 0.723 0.850 0.974

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	3.90	0.30	[3.30, 4.49]	12.83	< .001
sex [M]	0.44	0.23	[-0.01, 0.88]	1.94	0.053
age	0.03	6.97e-03	[0.02, 0.04]	4.20	< .001
ms	-6.70e-03	0.02	[-0.04, 0.03]	-0.39	0.697
freq 250 3h 90min wth	0.03	9.94e-03	[0.01, 0.05]	2.68	0.007
freq 250 3h 90min btw	-0.03	0.11	[-0.24, 0.17]	-0.32	0.748

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.27
SD (Residual)	0.48

```
=====
OUTCOME: sadness
EXPOSURE: fffreq_1 | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.5936 -0.5384 -0.0580 0.5295 11.2867

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.8110 1.3457
Residual 0.3342 0.5781
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.9160035 0.5450053 3.516
sexM -0.0718316 0.2447506 -0.293
age -0.0175293 0.0080199 -2.186
ms 0.0449468 0.0223324 2.013
ra_sum_250vs1_7d -0.1090700 0.0677965 -1.609
fffreq_1_0min_wth 0.0001248 0.0087989 0.014
fffreq_1_0min_btw 0.0016805 0.0769730 0.022

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r_250 fffrq_1_0mn_w
sexM -0.095
age -0.758 -0.073
ms_expsc_nt -0.217 -0.052 0.084
r_sm_250l_7 -0.077 -0.006 0.001 0.078
fffrq_1_0mn_w 0.047 0.011 -0.007 -0.151 -0.311
fffrq_1_0mn_b -0.796 0.019 0.352 -0.034 -0.053 0.025

Robustness weights for the residuals:
3342 weights are ~1. The remaining 1010 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.119 0.487 0.688 0.666 0.874 0.999

Robustness weights for the random effects:
128 weights are ~1. The remaining 28 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.331 0.547 0.721 0.693 0.822 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	1.92	0.55	[0.85, 2.98]	3.52	< .001
sex [M]	-0.07	0.24	[-0.55, 0.41]	-0.29	0.769
age	-0.02	8.02e-03	[-0.03, 0.00]	-2.19	0.029
ms	0.04	0.02	[0.00, 0.09]	2.01	0.044
ra_sum_250vs1_7d	-0.11	0.07	[-0.24, 0.02]	-1.61	0.108
fffreq_1_0min_wth	1.25e-04	8.80e-03	[-0.02, 0.02]	0.01	0.989
fffreq_1_0min_btw	1.68e-03	0.08	[-0.15, 0.15]	0.02	0.983

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	0.58

```
=====
OUTCOME: sadness
EXPOSURE: fffreq_1 | 15 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.6388 -0.5464 -0.0559  0.5478 11.1845
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.8747   1.3692
Residual                   0.3351   0.5789
Number of obs: 4352, groups: id, 156
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.635262   0.334429   4.890
sexM            -0.135891   0.249215  -0.545
age            -0.021843   0.008299  -2.632
ms              0.056601   0.022233   2.546
ra_sum_250vs1_7d 0.056367   0.071031   0.794
fffreq_1_15min_wth 0.069438   0.012315   5.639
fffreq_1_15min_btw 0.309054   0.122919   2.514
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 fffrq_1_15mn_w
sexM          -0.132
age           -0.768 -0.059
ms_expsc_nt   -0.396 -0.051  0.083
r_sm_250l_7   -0.201 -0.007 -0.008  0.071
fffreq_1_15mn_w -0.111 -0.008  0.002  0.099  0.416
fffreq_1_15mn_b -0.024 -0.049 -0.391  0.024  0.069  0.028
```

```
Robustness weights for the residuals:
3357 weights are ~= 1. The remaining 995 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.120  0.493  0.687  0.664  0.858  0.999
```

```
Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.355  0.613  0.781  0.759  0.948  0.998
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	1.64	0.33	[0.98, 2.29]	4.89	< .001
sex [M]	-0.14	0.25	[-0.62, 0.35]	-0.55	0.586
age	-0.02	8.30e-03	[-0.04, -0.01]	-2.63	0.009
ms	0.06	0.02	[0.01, 0.10]	2.55	0.011
ra_sum_250vs1_7d	0.06	0.07	[-0.08, 0.20]	0.79	0.427
fffreq_1_15min_wth	0.07	0.01	[0.05, 0.09]	5.64	< .001
fffreq_1_15min_btw	0.31	0.12	[0.07, 0.55]	2.51	0.012

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.37
SD (Residual)	0.58

```
=====
OUTCOME: sadness
EXPOSURE: fffreq_1 | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.6576 -0.5436 -0.0585 0.5419 11.2784

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.8230 1.3502
Residual 0.3328 0.5769
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.771446 0.332381 5.330
sexM -0.106478 0.245490 -0.434
age -0.025340 0.008306 -3.051
ms 0.055446 0.022137 2.505
ra_sum_250vs1_7d 0.044565 0.071099 0.627
fffreq_1_30min_wth 0.078781 0.016912 4.658
fffreq_1_30min_btw 0.633946 0.171051 3.706

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_30mn_w
sexM -0.132
age -0.807 -0.078
ms_expsc_nt -0.395 -0.050 0.086
r_sm_250l_7 -0.193 -0.003 -0.012 0.071
fffq_1_30mn_w -0.108 -0.005 0.000 0.098 0.424
fffq_1_30mn_b 0.110 0.003 -0.422 0.015 0.074 0.028

Robustness weights for the residuals:
3350 weights are ~ = 1. The remaining 1002 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.119 0.483 0.679 0.664 0.869 0.999

Robustness weights for the random effects:
125 weights are ~ = 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.339 0.607 0.790 0.764 0.947 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	1.77	0.33	[1.12, 2.42]	5.33	< .001
sex [M]	-0.11	0.25	[-0.59, 0.37]	-0.43	0.665
age	-0.03	8.31e-03	[-0.04, -0.01]	-3.05	0.002
ms	0.06	0.02	[0.01, 0.10]	2.50	0.012
ra_sum_250vs1_7d	0.04	0.07	[-0.09, 0.18]	0.63	0.531
fffreq_1_30min_wth	0.08	0.02	[0.05, 0.11]	4.66	< .001
fffreq_1_30min_btw	0.63	0.17	[0.30, 0.97]	3.71	< .001

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.35
SD (Residual)	0.58

```

=====
OUTCOME: sadness
EXPOSURE: freq_10_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.5061 -0.5405 -0.0586  0.5214 11.2975

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.803     1.3427
Residual                   0.334     0.5779
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.864134   0.346870   5.374
sexM            -0.074179   0.245638  -0.302
age             -0.017051   0.007550  -2.258
ms              0.039367   0.022210   1.772
ra_sum_250vs10_3h_7d -0.141348  0.050881  -2.778
freq_10_3h_0min_wth  0.001921   0.012513   0.154
freq_10_3h_0min_btw  0.021087   0.107582   0.196

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_0mn_w
sexM          -0.084
age          -0.836 -0.097
ms_expssc_nt -0.351 -0.044  0.091
r__25010_3_   -0.041 -0.005 -0.015  0.102
frq_10_3h_0mn_w  0.018  0.004  0.002 -0.063 -0.184
frq_10_3h_0mn_b -0.366 -0.109  0.126 -0.057 -0.054  0.050

Robustness weights for the residuals:
3345 weights are ~= 1. The remaining 1007 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.119  0.485   0.683   0.665  0.873   0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.328  0.549   0.711   0.688  0.821   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.86 | 0.35 | [ 1.18, 2.54] | 5.37 | < .001
sex [M] | -0.07 | 0.25 | [-0.56, 0.41] | -0.30 | 0.763
age | -0.02 | 7.55e-03 | [-0.03, 0.00] | -2.26 | 0.024
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.77 | 0.076
ra sum 250vs10 3h 7d | -0.14 | 0.05 | [-0.24, -0.04] | -2.78 | 0.005
freq 10 3h 0min wth | 1.92e-03 | 0.01 | [-0.02, 0.03] | 0.15 | 0.878
freq 10 3h 0min btw | 0.02 | 0.11 | [-0.19, 0.23] | 0.20 | 0.845

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 0.58

```

```

=====
OUTCOME: sadness
EXPOSURE: freq_10_3h | 120 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.4755 -0.5450 -0.0595  0.5223 11.2781

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7898    1.3378
Residual                   0.3337    0.5777
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.864679   0.322735   5.778
sexM            -0.095685   0.244370  -0.392
age            -0.018040   0.007553  -2.388
ms              0.041065   0.022184   1.851
ra_sum_250vs10_3h_7d -0.131541  0.050545  -2.602
freq_10_3h_120min_wth 0.010421  0.013293   0.784
freq_10_3h_120min_btw 0.074153  0.108989   0.680

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_120mn_w
sexM          -0.126
age           -0.830 -0.069
ms_expsc_nt   -0.399 -0.051  0.099
r__25010_3_    -0.069 -0.016 -0.018  0.099
frq_10_3h_120mn_w -0.034 -0.008  0.004  0.076  0.143
frq_10_3h_120mn_b -0.079 -0.094 -0.154 -0.001  0.062  0.000

Robustness weights for the residuals:
3342 weights are ~= 1. The remaining 1010 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.119  0.485   0.682   0.666  0.872   0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.324  0.557   0.754   0.718  0.921   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.86 | 0.32 | [ 1.23, 2.50] | 5.78 | < .001
sex [M] | -0.10 | 0.24 | [-0.57, 0.38] | -0.39 | 0.695
age | -0.02 | 7.55e-03 | [-0.03, 0.00] | -2.39 | 0.017
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.85 | 0.064
ra sum 250vs10 3h 7d | -0.13 | 0.05 | [-0.23, -0.03] | -2.60 | 0.009
freq 10 3h 120min wth | 0.01 | 0.01 | [-0.02, 0.04] | 0.78 | 0.433
freq 10 3h 120min btw | 0.07 | 0.11 | [-0.14, 0.29] | 0.68 | 0.496

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 0.58

```



```

=====
OUTCOME: sadness
EXPOSURE: freq_10_3h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5309 -0.5412 -0.0586  0.5223 11.2201

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7941    1.339
Residual                   0.3341    0.578
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.79842    0.37719   4.768
sexM            -0.07649    0.24364  -0.314
age             -0.01735    0.00750  -2.314
ms              0.04875    0.02266   2.151
ra_sum_250vs10_3h_7d -0.09100    0.05401  -1.685
freq_10_3h_30min_wth 0.02259    0.00911   2.480
freq_10_3h_30min_btw 0.00965    0.05667   0.170

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_30mn_w
sexM          -0.104
age           -0.684 -0.083
ms_expsc_nt   -0.387 -0.054  0.093
r__25010_3_    -0.129 -0.016 -0.013  0.162
frq_10_3h_30mn_w -0.105 -0.015  0.008  0.205  0.370
frq_10_3h_30mn_b -0.515 -0.019 -0.086  0.073  0.101  0.047

Robustness weights for the residuals:
3340 weights are ~= 1. The remaining 1012 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.120  0.486   0.689   0.668  0.872   0.998

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.327  0.548   0.706   0.687  0.828   0.981

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.80 | 0.38 | [ 1.06, 2.54] | 4.77 | < .001
sex [M] | -0.08 | 0.24 | [-0.55, 0.40] | -0.31 | 0.754
age | -0.02 | 7.50e-03 | [-0.03, 0.00] | -2.31 | 0.021
ms | 0.05 | 0.02 | [ 0.00, 0.09] | 2.15 | 0.032
ra sum 250vs10 3h 7d | -0.09 | 0.05 | [-0.20, 0.01] | -1.68 | 0.092
freq 10 3h 30min wth | 0.02 | 9.11e-03 | [ 0.00, 0.04] | 2.48 | 0.013
freq 10 3h 30min btw | 9.65e-03 | 0.06 | [-0.10, 0.12] | 0.17 | 0.865

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 0.58

```

```

=====
OUTCOME: sadness
EXPOSURE: freq_10_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5238 -0.5424 -0.0562  0.5272 11.2529

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 1.7942   1.339
Residual                0.3329   0.577
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.836376   0.342624   5.360
sexM            -0.077198   0.243829  -0.317
age            -0.017397   0.007511  -2.316
ms              0.044348   0.022469   1.974
ra_sum_250vs10_3h_7d -0.116520  0.052749  -2.209
freq_10_3h_60min_wth  0.011760   0.009301   1.264
freq_10_3h_60min_btw  0.013293   0.061318   0.217

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_60mn_w
sexM          -0.111
age           -0.766 -0.080
ms_expsc_nt   -0.398 -0.054  0.094
r__25010_3_    -0.106 -0.017 -0.014  0.142
frq_10_3h_60mn_w -0.085 -0.014  0.008  0.175  0.316
frq_10_3h_60mn_b -0.335 -0.044 -0.102  0.049  0.088  0.031

Robustness weights for the residuals:
3339 weights are ~= 1. The remaining 1013 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.120  0.486   0.685   0.666  0.872   0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.327  0.547   0.704   0.688  0.831   0.987

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.84 | 0.34 | [ 1.16, 2.51] | 5.36 | < .001
sex [M] | -0.08 | 0.24 | [-0.56, 0.40] | -0.32 | 0.752
age | -0.02 | 7.51e-03 | [-0.03, 0.00] | -2.32 | 0.021
ms | 0.04 | 0.02 | [ 0.00, 0.09] | 1.97 | 0.048
ra sum 250vs10 3h 7d | -0.12 | 0.05 | [-0.22, -0.01] | -2.21 | 0.027
freq 10 3h 60min wth | 0.01 | 9.30e-03 | [-0.01, 0.03] | 1.26 | 0.206
freq 10 3h 60min btw | 0.01 | 0.06 | [-0.11, 0.13] | 0.22 | 0.828

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 0.58

```

=====
OUTCOME: sadness
EXPOSURE: freq_10_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4653 -0.5433 -0.0600 0.5250 11.2971

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7915 1.3385
Residual 0.3325 0.5767
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.830226 0.328473 5.572
sexM -0.086564 0.243679 -0.355
age -0.017700 0.007511 -2.356
ms 0.043338 0.022206 1.952
ra_sum_250vs10_3h_7d -0.117074 0.051467 -2.275
freq_10_3h_90min_wth 0.016087 0.010365 1.552
freq_10_3h_90min_btw 0.042257 0.073221 0.577

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_90mn_w
sexM -0.122
age -0.811 -0.079
ms_expsc_nt -0.396 -0.052 0.097
r__25010_3_ -0.083 -0.015 -0.016 0.112
frq_10_3h_90mn_w -0.050 -0.010 0.004 0.103 0.238
frq_10_3h_90mn_b -0.198 -0.048 -0.110 0.016 0.075 0.014

Robustness weights for the residuals:
3336 weights are ~= 1. The remaining 1016 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.119 0.488 0.685 0.667 0.869 0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.325 0.553 0.753 0.720 0.929 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
(Intercept) | 1.83 | 0.33 | [1.19, 2.47] | 5.57 | < .001
sex [M] | -0.09 | 0.24 | [-0.56, 0.39] | -0.36 | 0.722
age | -0.02 | 7.51e-03 | [-0.03, 0.00] | -2.36 | 0.018
ms | 0.04 | 0.02 | [0.00, 0.09] | 1.95 | 0.051
ra_sum_250vs10_3h_7d | -0.12 | 0.05 | [-0.22, -0.02] | -2.27 | 0.023
freq_10_3h_90min_wth | 0.02 | 0.01 | [0.00, 0.04] | 1.55 | 0.121
freq_10_3h_90min_btw | 0.04 | 0.07 | [-0.10, 0.19] | 0.58 | 0.564

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 1.34
SD (Residual) | 0.58

```
=====
OUTCOME: sadness
EXPOSURE: freq_250_1h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.3088 -0.5271 -0.0548 0.5256 8.9529

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7421 1.3199
Residual 0.3663 0.6052
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.751055 0.409500 4.276
sexM -0.165712 0.237134 -0.699
age -0.017928 0.007272 -2.465
ms 0.044269 0.021365 2.072
freq_250_1h_0min_wth 0.025171 0.008136 3.094
freq_250_1h_0min_btw 0.028070 0.064300 0.437

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_1h_0mn_w
sexM -0.200
age -0.614 -0.072
ms -0.342 -0.039 0.099
freq_250_1h_0mn_w -0.031 -0.002 0.008 0.093
freq_250_1h_0mn_b -0.643 0.128 -0.064 0.059 0.006

Robustness weights for the residuals:
3597 weights are ~= 1. The remaining 1085 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.150 0.494 0.686 0.674 0.882 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.350 0.524 0.682 0.680 0.855 0.992

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	1.75	0.41	[0.95, 2.55]	4.28	< .001
sex [M]	-0.17	0.24	[-0.63, 0.30]	-0.70	0.485
age	-0.02	7.27e-03	[-0.03, 0.00]	-2.47	0.014
ms	0.04	0.02	[0.00, 0.09]	2.07	0.038
freq 250 1h 0min wth	0.03	8.14e-03	[0.01, 0.04]	3.09	0.002
freq 250 1h 0min btw	0.03	0.06	[-0.10, 0.15]	0.44	0.662

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	0.61

```

=====
OUTCOME: sadness
EXPOSURE: freq_250_1h | 15 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.2732 -0.5229 -0.0538  0.5358  8.9413

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7466   1.3216
Residual                   0.3657   0.6047
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.967080   0.329350   5.973
sexM           -0.152921   0.237024  -0.645
age            -0.018152   0.007289  -2.490
ms              0.042010   0.021272   1.975
freq_250_1h_15min_wth -0.021719   0.011005  -1.973
freq_250_1h_15min_btw -0.090880   0.098904  -0.919

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_15mn_w
sexM          -0.111
age           -0.839 -0.073
ms            -0.366 -0.043  0.100
frq_250_1h_15mn_w  0.021  0.001 -0.005 -0.059
frq_250_1h_15mn_b -0.304 -0.114  0.079 -0.037  0.003

Robustness weights for the residuals:
3594 weights are ~= 1. The remaining 1088 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.150  0.493  0.685  0.673  0.874  0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.355  0.539  0.673  0.670  0.841  0.977

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.97 | 0.33 | [ 1.32, 2.61] | 5.97 | < .001
sex [M] | -0.15 | 0.24 | [-0.62, 0.31] | -0.65 | 0.519
age | -0.02 | 7.29e-03 | [-0.03, 0.00] | -2.49 | 0.013
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.97 | 0.048
freq 250 1h 15min wth | -0.02 | 0.01 | [-0.04, 0.00] | -1.97 | 0.048
freq 250 1h 15min btw | -0.09 | 0.10 | [-0.28, 0.10] | -0.92 | 0.358

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.32
SD (Residual) | 0.60

```

```

=====
OUTCOME: sadness
EXPOSURE: freq_250_1h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.2698 -0.5229 -0.0564  0.5379  8.9454

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 1.7381   1.3184
 Residual                0.3649   0.6041
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)      1.97810    0.32505   6.086
sexM             -0.17455    0.23497  -0.743
age              -0.01876    0.00730  -2.570
ms                0.04301    0.02126   2.023
freq_250_1h_30min_wth -0.03702    0.01661  -2.229
freq_250_1h_30min_btw -0.22534    0.18768  -1.201

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_30mn_w
sexM          -0.142
age           -0.853 -0.067
ms            -0.378 -0.047  0.101
frq_250_1h_30mn_w  0.028  0.004 -0.007 -0.074
frq_250_1h_30mn_b -0.269 -0.025  0.118 -0.016  0.000

Robustness weights for the residuals:
3587 weights are ~= 1. The remaining 1095 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.150  0.493  0.684  0.675  0.879  0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.356  0.535  0.698  0.681  0.865  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.98 | 0.33 | [ 1.34, 2.62] | 6.09 | < .001
sex [M] | -0.17 | 0.23 | [-0.64, 0.29] | -0.74 | 0.458
age | -0.02 | 7.30e-03 | [-0.03, 0.00] | -2.57 | 0.010
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 2.02 | 0.043
freq 250 1h 30min wth | -0.04 | 0.02 | [-0.07, 0.00] | -2.23 | 0.026
freq 250 1h 30min btw | -0.23 | 0.19 | [-0.59, 0.14] | -1.20 | 0.230

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.32
SD (Residual) | 0.60

```

```
=====
OUTCOME: sadness
EXPOSURE: freq_250_2h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.2751 -0.5250 -0.0573 0.5334 8.9193

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7426 1.3201
Residual 0.3647 0.6039
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.792540 0.361623 4.957
sexM -0.168235 0.236185 -0.712
age -0.017692 0.007261 -2.437
ms 0.037620 0.021265 1.769
freq_250_2h_0min_wth -0.001464 0.008188 -0.179
freq_250_2h_0min_btw 0.039463 0.066326 0.595

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_2h_0mn_w
sexM -0.179
age -0.758 -0.062
ms -0.354 -0.045 0.104
freq_250_2h_0mn_w -0.027 -0.001 0.007 0.080
freq_250_2h_0mn_b -0.499 0.092 0.029 0.020 0.002

Robustness weights for the residuals:
3594 weights are ~= 1. The remaining 1088 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.151 0.491 0.682 0.672 0.876 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.348 0.521 0.709 0.691 0.862 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	1.79	0.36	[1.08, 2.50]	4.96	< .001
sex [M]	-0.17	0.24	[-0.63, 0.29]	-0.71	0.476
age	-0.02	7.26e-03	[-0.03, 0.00]	-2.44	0.015
ms	0.04	0.02	[0.00, 0.08]	1.77	0.077
freq 250 2h 0min wth	-1.46e-03	8.19e-03	[-0.02, 0.01]	-0.18	0.858
freq 250 2h 0min btw	0.04	0.07	[-0.09, 0.17]	0.59	0.552

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	0.60

```

=====
OUTCOME: sadness
EXPOSURE: freq_250_2h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.2482 -0.5246 -0.0544  0.5358  8.9649

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 1.7403   1.3192
Residual                0.3654   0.6045
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.056614   0.337753   6.089
sexM            -0.157400   0.236312  -0.666
age            -0.018027   0.007267  -2.481
ms              0.039772   0.021220   1.874
freq_250_2h_30min_wth -0.009776  0.009085  -1.076
freq_250_2h_30min_btw -0.105223  0.076605  -1.374

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_2h_30mn_w
sexM          -0.104
age           -0.818 -0.071
ms            -0.360 -0.045  0.101
freq_250_2h_30mn_w 0.007  0.000 -0.001 -0.020
freq_250_2h_30mn_b -0.374 -0.103  0.062 -0.022  0.000

Robustness weights for the residuals:
3589 weights are ~= 1. The remaining 1093 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.150  0.495  0.685  0.675  0.880  0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.354  0.546  0.679  0.669  0.844  0.955

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.06 | 0.34 | [ 1.39, 2.72] | 6.09 | < .001
sex [M] | -0.16 | 0.24 | [-0.62, 0.31] | -0.67 | 0.505
age | -0.02 | 7.27e-03 | [-0.03, 0.00] | -2.48 | 0.013
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.87 | 0.061
freq 250 2h 30min wth | -9.78e-03 | 9.09e-03 | [-0.03, 0.01] | -1.08 | 0.282
freq 250 2h 30min btw | -0.11 | 0.08 | [-0.26, 0.04] | -1.37 | 0.170

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.32
SD (Residual) | 0.60

```



```

=====
OUTCOME: sadness
EXPOSURE: freq_250_2h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.2736 -0.5249 -0.0546  0.5352  8.9315

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7545    1.3246
Residual                   0.3654    0.6045
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.968787   0.321145   6.131
sexM            -0.156408   0.236948  -0.660
age            -0.018065   0.007285  -2.480
ms              0.038303   0.021220   1.805
freq_250_2h_60min_wth -0.017694  0.013990  -1.265
freq_250_2h_60min_btw -0.131273  0.127923  -1.026

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_2h_60mn_w
sexM          -0.132
age          -0.846 -0.067
ms          -0.384 -0.046  0.102
freq_250_2h_60mn_w  0.000  0.000  0.000  0.000
freq_250_2h_60mn_b -0.206 -0.090  0.031 -0.013  0.001

Robustness weights for the residuals:
3587 weights are ~= 1. The remaining 1095 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.151  0.494  0.685  0.675  0.881  0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.358  0.540  0.690  0.685  0.873  0.966

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.97 | 0.32 | [ 1.34, 2.60] | 6.13 | < .001
sex [M] | -0.16 | 0.24 | [-0.62, 0.31] | -0.66 | 0.509
age | -0.02 | 7.29e-03 | [-0.03, 0.00] | -2.48 | 0.013
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.81 | 0.071
freq 250 2h 60min wth | -0.02 | 0.01 | [-0.05, 0.01] | -1.26 | 0.206
freq 250 2h 60min btw | -0.13 | 0.13 | [-0.38, 0.12] | -1.03 | 0.305

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.32
SD (Residual) | 0.60

```

```

=====
OUTCOME: sadness
EXPOSURE: freq_250_2h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.2609 -0.5214 -0.0576  0.5366  8.8860

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.716     1.3101
Residual                0.366     0.6049
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.938837   0.313281   6.189
sexM            -0.140574   0.234295  -0.600
age            -0.018013   0.007206  -2.500
ms              0.039389   0.021224   1.856
freq_250_2h_90min_wth -0.057236  0.032110  -1.782
freq_250_2h_90min_btw -0.568176  0.375391  -1.514

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_2h_90mn_w
sexM          -0.143
age           -0.855 -0.066
ms            -0.396 -0.047  0.104
frq_250_2h_90mn_w  0.010  0.002 -0.002 -0.027
frq_250_2h_90mn_b -0.109 -0.085  0.020 -0.001 -0.001

Robustness weights for the residuals:
3590 weights are ~= 1. The remaining 1092 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.151  0.493  0.684  0.675  0.878  0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.354  0.533  0.683  0.677  0.841  0.984

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 1.94 | 0.31 | [ 1.32, 2.55] | 6.19 | < .001
sex [M] | -0.14 | 0.23 | [-0.60, 0.32] | -0.60 | 0.549
age | -0.02 | 7.21e-03 | [-0.03, 0.00] | -2.50 | 0.012
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.86 | 0.064
freq 250 2h 90min wth | -0.06 | 0.03 | [-0.12, 0.01] | -1.78 | 0.075
freq 250 2h 90min btw | -0.57 | 0.38 | [-1.30, 0.17] | -1.51 | 0.130

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.31
SD (Residual) | 0.60

```

```
=====
OUTCOME: sadness
EXPOSURE: freq_250_3h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.2903 -0.5231 -0.0603 0.5308 8.9069

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7460 1.3214
Residual 0.3646 0.6038
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.899130 0.352610 5.386
sexM -0.172640 0.235861 -0.732
age -0.017977 0.007300 -2.463
ms 0.036098 0.021223 1.701
freq_250_3h_0min_wth -0.011425 0.009373 -1.219
freq_250_3h_0min_btw 0.005244 0.075976 0.069

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_3h_0mn_w
sexM -0.165
age -0.805 -0.058
ms -0.353 -0.047 0.102
freq_250_3h_0mn_w -0.017 0.000 0.003 0.055
freq_250_3h_0mn_b -0.457 0.061 0.099 0.002 0.002

Robustness weights for the residuals:
3587 weights are ~= 1. The remaining 1095 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.151 0.491 0.686 0.674 0.878 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.353 0.527 0.678 0.683 0.867 0.975

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	1.90	0.35	[1.21, 2.59]	5.39	< .001
sex [M]	-0.17	0.24	[-0.64, 0.29]	-0.73	0.464
age	-0.02	7.30e-03	[-0.03, 0.00]	-2.46	0.014
ms	0.04	0.02	[-0.01, 0.08]	1.70	0.089
freq 250 3h 0min wth	-0.01	9.37e-03	[-0.03, 0.01]	-1.22	0.223
freq 250 3h 0min btw	5.24e-03	0.08	[-0.14, 0.15]	0.07	0.945

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	0.60

```
=====
OUTCOME: sadness
EXPOSURE: freq_250_3h | 120 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.2663 -0.5225 -0.0573 0.5329 8.9553

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7357 1.3174
Residual 0.3653 0.6044
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 1.974113 0.319687 6.175
sexM -0.157845 0.235566 -0.670
age -0.018591 0.007269 -2.558
ms 0.039786 0.021215 1.875
freq_250_3h_120min_wth -0.033342 0.020500 -1.626
freq_250_3h_120min_btw -0.254671 0.210848 -1.208

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ freq_250_3h_120mn_w
sexM -0.133
age -0.854 -0.071
ms -0.385 -0.046 0.101
freq_250_3h_120mn_w 0.010 0.001 -0.002 -0.025
freq_250_3h_120mn_b -0.206 -0.084 0.083 -0.016 0.001

Robustness weights for the residuals:
3592 weights are ~= 1. The remaining 1090 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.150 0.493 0.683 0.674 0.879 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.355 0.532 0.694 0.681 0.876 0.976

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	1.97	0.32	[1.35, 2.60]	6.18	< .001
sex [M]	-0.16	0.24	[-0.62, 0.30]	-0.67	0.503
age	-0.02	7.27e-03	[-0.03, 0.00]	-2.56	0.011
ms	0.04	0.02	[0.00, 0.08]	1.88	0.061
freq 250 3h 120min wth	-0.03	0.02	[-0.07, 0.01]	-1.63	0.104
freq 250 3h 120min btw	-0.25	0.21	[-0.67, 0.16]	-1.21	0.227

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	0.60

```
=====
OUTCOME: sadness
EXPOSURE: freq_250_3h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.2367 -0.5244 -0.0542 0.5347 8.9334

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7555 1.3249
Residual 0.3652 0.6043
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 2.018690 0.346490 5.826
sexM -0.167893 0.236941 -0.709
age -0.017266 0.007291 -2.368
ms 0.038784 0.021218 1.828
freq_250_3h_30min_wth -0.006612 0.008372 -0.790
freq_250_3h_30min_btw -0.056067 0.062837 -0.892

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_30mn_w
sexM -0.103
age -0.760 -0.061
ms -0.360 -0.047 0.102
frq_250_3h_30mn_w 0.008 0.000 -0.002 -0.024
frq_250_3h_30mn_b -0.421 -0.086 -0.044 0.003 0.000

Robustness weights for the residuals:
3589 weights are ~= 1. The remaining 1093 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.151 0.492 0.686 0.674 0.880 0.999

Robustness weights for the random effects:
132 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.353 0.547 0.686 0.683 0.840 0.990

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	2.02	0.35	[1.34, 2.70]	5.83	< .001
sex [M]	-0.17	0.24	[-0.63, 0.30]	-0.71	0.479
age	-0.02	7.29e-03	[-0.03, 0.00]	-2.37	0.018
ms	0.04	0.02	[0.00, 0.08]	1.83	0.068
freq 250 3h 30min wth	-6.61e-03	8.37e-03	[-0.02, 0.01]	-0.79	0.430
freq 250 3h 30min btw	-0.06	0.06	[-0.18, 0.07]	-0.89	0.372

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.32
SD (Residual)	0.60

```

=====
OUTCOME: sadness
EXPOSURE: freq_250_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.2599 -0.5277 -0.0587  0.5298  9.0621

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 1.7428   1.3201
 Residual                0.3657   0.6047
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    2.018588   0.329029   6.135
sexM            -0.154088   0.236629  -0.651
age            -0.017723   0.007259  -2.441
ms              0.036995   0.021221   1.743
freq_250_3h_60min_wth -0.026937  0.010046  -2.681
freq_250_3h_60min_btw -0.093172  0.077163  -1.207

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_3h_60mn_w
sexM          -0.113
age           -0.823 -0.066
ms            -0.377 -0.047  0.103
freq_250_3h_60mn_w -0.005 -0.001  0.002  0.013
freq_250_3h_60mn_b -0.305 -0.109  0.016 -0.001  0.000

Robustness weights for the residuals:
3594 weights are ~= 1. The remaining 1088 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.148  0.494  0.683  0.674  0.878  0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.357  0.546  0.701  0.690  0.864  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.02 | 0.33 | [ 1.37, 2.66] | 6.13 | < .001
sex [M] | -0.15 | 0.24 | [-0.62, 0.31] | -0.65 | 0.515
age | -0.02 | 7.26e-03 | [-0.03, 0.00] | -2.44 | 0.015
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.74 | 0.081
freq 250 3h 60min wth | -0.03 | 0.01 | [-0.05, -0.01] | -2.68 | 0.007
freq 250 3h 60min btw | -0.09 | 0.08 | [-0.24, 0.06] | -1.21 | 0.227

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.32
SD (Residual) | 0.60

```

```

=====
OUTCOME: sadness
EXPOSURE: freq_250_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.2694 -0.5255 -0.0598  0.5306  8.9976

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7410    1.3195
Residual                   0.3658    0.6048
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    1.995407   0.323137   6.175
sexM            -0.156951  0.236066  -0.665
age            -0.018273  0.007266  -2.515
ms              0.036797  0.021230   1.733
freq_250_3h_90min_wth -0.035470  0.012420  -2.856
freq_250_3h_90min_btw -0.123230  0.109885  -1.121

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_90mn_w
sexM          -0.127
age           -0.845 -0.069
ms            -0.382 -0.046  0.102
frq_250_3h_90mn_w -0.011 -0.002  0.003  0.027
frq_250_3h_90mn_b -0.245 -0.091  0.055 -0.009  0.001

Robustness weights for the residuals:
3595 weights are ~= 1. The remaining 1087 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.149  0.493  0.686  0.674  0.877  0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.357  0.538  0.707  0.691  0.890  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 2.00 | 0.32 | [ 1.36, 2.63] | 6.18 | < .001
sex [M] | -0.16 | 0.24 | [-0.62, 0.31] | -0.66 | 0.506
age | -0.02 | 7.27e-03 | [-0.03, 0.00] | -2.52 | 0.012
ms | 0.04 | 0.02 | [ 0.00, 0.08] | 1.73 | 0.083
freq 250 3h 90min wth | -0.04 | 0.01 | [-0.06, -0.01] | -2.86 | 0.004
freq 250 3h 90min btw | -0.12 | 0.11 | [-0.34, 0.09] | -1.12 | 0.262

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.32
SD (Residual) | 0.60

```

```
=====
OUTCOME: sleepiness
EXPOSURE: fffreq_1 | 0 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
      Min       1Q   Median       3Q      Max
-6.1453 -0.6226 -0.0199  0.6281  6.7238
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7789   1.334
Residual                   0.3113   0.558
Number of obs: 4352, groups: id, 156
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.117630   0.539348   7.634
sexM            -0.164614   0.242494  -0.679
age            -0.032478   0.007945  -4.088
ms             -0.012757   0.021593  -0.591
ra_sum_250vs1_7d -0.019762   0.065455  -0.302
fffreq_1_0min_wth 0.016041   0.008493   1.889
fffreq_1_0min_btw 0.001854   0.076260   0.024
```

```
Correlation of Fixed Effects:
              (Intr) sexM    age    ms_xp_ r__250 fffrq_1_0mn_w
sexM          -0.096
age           -0.758 -0.073
ms_expsc_nt   -0.212 -0.050  0.082
r_sm_250l_7   -0.075 -0.006  0.001  0.078
fffrq_1_0mn_w  0.046  0.011 -0.007 -0.151 -0.311
fffrq_1_0mn_b -0.798  0.019  0.352 -0.033 -0.052  0.024
```

```
Robustness weights for the residuals:
3443 weights are ~= 1. The remaining 909 ones are summarized as
      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
0.200   0.595   0.772   0.743   0.922   0.999
```

```
Robustness weights for the random effects:
122 weights are ~= 1. The remaining 34 ones are summarized as
      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
0.525   0.795   0.935   0.881   0.982   0.999
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	4.12	0.54	[3.06, 5.18]	7.63	< .001
sex [M]	-0.16	0.24	[-0.64, 0.31]	-0.68	0.497
age	-0.03	7.95e-03	[-0.05, -0.02]	-4.09	< .001
ms	-0.01	0.02	[-0.06, 0.03]	-0.59	0.555
ra_sum_250vs1_7d	-0.02	0.07	[-0.15, 0.11]	-0.30	0.763
fffreq_1_0min_wth	0.02	8.49e-03	[0.00, 0.03]	1.89	0.059
fffreq_1_0min_btw	1.85e-03	0.08	[-0.15, 0.15]	0.02	0.981

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	0.56


```
=====
OUTCOME: sleepiness
EXPOSURE: fffreq_1 | 15 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.2333 -0.6219 -0.0177  0.6216  6.7958
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.7833  1.3354
Residual                0.3106  0.5573
Number of obs: 4352, groups: id, 156
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)   3.9782505  0.3254031  12.226
sexM          -0.1833887  0.2430259  -0.755
age           -0.0330883  0.0080920  -4.089
ms            -0.0008501  0.0214254  -0.040
ra_sum_250vs1_7d 0.0745449  0.0684010   1.090
fffreq_1_15min_wth 0.0234499  0.0118576   1.978
fffreq_1_15min_btw 0.0449399  0.1198629   0.375
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 fffrq_1_15mn_w
sexM          -0.133
age           -0.769 -0.059
ms_expsc_nt   -0.393 -0.050  0.082
r_sm_250l_7   -0.199 -0.007 -0.008  0.071
fffrq_1_15mn_w -0.110 -0.008  0.002  0.099  0.416
fffrq_1_15mn_b -0.023 -0.049 -0.391  0.024  0.068  0.028
```

```
Robustness weights for the residuals:
3460 weights are ~= 1. The remaining 892 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.198  0.589   0.765   0.736  0.907   0.999
```

```
Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.544  0.786   0.900   0.874  0.981   0.998
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.98	0.33	[3.34, 4.62]	12.23	< .001
sex [M]	-0.18	0.24	[-0.66, 0.29]	-0.75	0.451
age	-0.03	8.09e-03	[-0.05, -0.02]	-4.09	< .001
ms	-8.50e-04	0.02	[-0.04, 0.04]	-0.04	0.968
ra_sum_250vs1_7d	0.07	0.07	[-0.06, 0.21]	1.09	0.276
fffreq_1_15min_wth	0.02	0.01	[0.00, 0.05]	1.98	0.048
fffreq_1_15min_btw	0.04	0.12	[-0.19, 0.28]	0.37	0.708

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	0.56

```
=====
OUTCOME: sleepiness
EXPOSURE: fffreq_1 | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.2320 -0.6234 -0.0215 0.6247 6.7889

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7620 1.3274
Residual 0.3105 0.5572
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.0180337 0.3257311 12.335
sexM -0.1852181 0.2412931 -0.768
age -0.0364645 0.0081631 -4.467
ms -0.0004944 0.0214063 -0.023
ra_sum_250vs1_7d 0.0809675 0.0686851 1.179
fffreq_1_30min_wth 0.0315121 0.0163354 1.929
fffreq_1_30min_btw 0.2466537 0.1681190 1.467

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_30mn_w
sexM -0.133
age -0.809 -0.078
ms_expsc_nt -0.390 -0.049 0.084
r_sm_250l_7 -0.190 -0.003 -0.012 0.071
fffrq_1_30mn_w -0.107 -0.005 0.000 0.098 0.424
fffrq_1_30mn_b 0.111 0.003 -0.422 0.015 0.073 0.028

Robustness weights for the residuals:
3453 weights are ~1. The remaining 899 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.198 0.590 0.766 0.738 0.910 0.999

Robustness weights for the random effects:
126 weights are ~1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.603 0.766 0.904 0.863 0.970 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	4.02	0.33	[3.38, 4.66]	12.34	< .001
sex [M]	-0.19	0.24	[-0.66, 0.29]	-0.77	0.443
age	-0.04	8.16e-03	[-0.05, -0.02]	-4.47	< .001
ms	-4.94e-04	0.02	[-0.04, 0.04]	-0.02	0.982
ra_sum_250vs1_7d	0.08	0.07	[-0.05, 0.22]	1.18	0.239
fffreq_1_30min_wth	0.03	0.02	[0.00, 0.06]	1.93	0.054
fffreq_1_30min_btw	0.25	0.17	[-0.08, 0.58]	1.47	0.142

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.33
SD (Residual)	0.56

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_10_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.0428 -0.6226 -0.0143  0.6308  6.7410

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7734    1.3317
Residual                   0.3117    0.5583
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.066120   0.342932  11.857
sexM            -0.167028   0.243552  -0.686
age             -0.032293   0.007485  -4.314
ms             -0.008216   0.021493  -0.382
ra_sum_250vs10_3h_7d 0.011855   0.049185   0.241
freq_10_3h_0min_wth 0.050020   0.012089   4.138
freq_10_3h_0min_btw 0.028712   0.106619   0.269

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_0mn_w
sexM          -0.085
age           -0.837 -0.097
ms_expsc_nt   -0.343 -0.043  0.089
r__25010_3_    -0.040 -0.005 -0.015  0.102
frq_10_3h_0mn_w 0.018  0.004  0.001 -0.063 -0.185
frq_10_3h_0mn_b -0.368 -0.109  0.127 -0.056 -0.053  0.049

Robustness weights for the residuals:
3450 weights are ~= 1. The remaining 902 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.200  0.596  0.771  0.742  0.921  0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.522  0.784  0.922  0.870  0.975  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.07 | 0.34 | [ 3.39, 4.74] | 11.86 | < .001
sex [M] | -0.17 | 0.24 | [-0.64, 0.31] | -0.69 | 0.493
age | -0.03 | 7.49e-03 | [-0.05, -0.02] | -4.31 | < .001
ms | -8.22e-03 | 0.02 | [-0.05, 0.03] | -0.38 | 0.702
ra_sum_250vs10_3h_7d | 0.01 | 0.05 | [-0.08, 0.11] | 0.24 | 0.810
freq_10_3h_0min_wth | 0.05 | 0.01 | [ 0.03, 0.07] | 4.14 | < .001
freq_10_3h_0min_btw | 0.03 | 0.11 | [-0.18, 0.24] | 0.27 | 0.788

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.33
SD (Residual) | 0.56

```

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_10_3h | 120 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.2516 -0.6227 -0.0128  0.6272  6.7964

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7920    1.3386
Residual                   0.3109    0.5576
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.0114518  0.3211473  12.491
sexM            -0.2094226  0.2444121  -0.857
age            -0.0331370  0.0075523  -4.388
ms             -0.0004585  0.0214657  -0.021
ra_sum_250vs10_3h_7d  0.0652145  0.0488286   1.336
freq_10_3h_120min_wth  0.0274251  0.0128322   2.137
freq_10_3h_120min_btw  0.0805605  0.1090067   0.739

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_120mn_w
sexM          -0.128
age           -0.832 -0.069
ms_expsc_nt   -0.388 -0.049  0.096
r__25010_3_    -0.067 -0.016 -0.018  0.099
frq_10_3h_120mn_w -0.033 -0.008  0.003  0.076  0.143
frq_10_3h_120mn_b -0.080 -0.094 -0.154 -0.001  0.060  0.000

Robustness weights for the residuals:
3449 weights are ~= 1. The remaining 903 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.198  0.589   0.768   0.741  0.916   0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.508  0.792   0.923   0.877  0.984   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.01 | 0.32 | [ 3.38, 4.64] | 12.49 | < .001
sex [M] | -0.21 | 0.24 | [-0.69, 0.27] | -0.86 | 0.392
age | -0.03 | 7.55e-03 | [-0.05, -0.02] | -4.39 | < .001
ms | -4.58e-04 | 0.02 | [-0.04, 0.04] | -0.02 | 0.983
ra sum 250vs10 3h 7d | 0.07 | 0.05 | [-0.03, 0.16] | 1.34 | 0.182
freq 10 3h 120min wth | 0.03 | 0.01 | [ 0.00, 0.05] | 2.14 | 0.033
freq 10 3h 120min btw | 0.08 | 0.11 | [-0.13, 0.29] | 0.74 | 0.460

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.34
SD (Residual) | 0.56

```

```
=====
OUTCOME: sleepiness
EXPOSURE: freq_10_3h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.2563 -0.6224 -0.0210 0.6199 6.7615

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7955 1.3400
Residual 0.3103 0.5571
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.800991 0.375228 10.130
sexM -0.198547 0.243627 -0.815
age -0.032706 0.007498 -4.362
ms 0.008133 0.021892 0.371
ra_sum_250vs10_3h_7d 0.098073 0.052086 1.883
freq_10_3h_30min_wth 0.020348 0.008781 2.317
freq_10_3h_30min_btw 0.052667 0.056642 0.930

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_30mn_w
sexM -0.106
age -0.686 -0.083
ms_expsc_nt -0.376 -0.052 0.090
r__25010_3_ -0.125 -0.016 -0.012 0.162
frq_10_3h_30mn_w -0.102 -0.015 0.008 0.205 0.370
frq_10_3h_30mn_b -0.516 -0.019 -0.086 0.071 0.098 0.045

Robustness weights for the residuals:
3453 weights are ~1. The remaining 899 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.199 0.591 0.765 0.738 0.915 0.999

Robustness weights for the random effects:
126 weights are ~1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.524 0.794 0.913 0.873 0.967 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.80	0.38	[3.07, 4.54]	10.13	< .001
sex [M]	-0.20	0.24	[-0.68, 0.28]	-0.81	0.415
age	-0.03	7.50e-03	[-0.05, -0.02]	-4.36	< .001
ms	8.13e-03	0.02	[-0.03, 0.05]	0.37	0.710
ra_sum_250vs10_3h_7d	0.10	0.05	[0.00, 0.20]	1.88	0.060
freq_10_3h_30min_wth	0.02	8.78e-03	[0.00, 0.04]	2.32	0.021
freq_10_3h_30min_btw	0.05	0.06	[-0.06, 0.16]	0.93	0.353

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	0.56

```
=====
OUTCOME: sleepiness
EXPOSURE: freq_10_3h | 60 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.2550 -0.6124 -0.0238  0.6202  6.7651
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.7914   1.3384
Residual                0.3103   0.5571
Number of obs: 4352, groups: id, 156
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    3.877651   0.340532  11.387
sexM            -0.205393   0.243534  -0.843
age            -0.032488   0.007501  -4.331
ms              0.012698   0.021742   0.584
ra_sum_250vs10_3h_7d 0.110585   0.050962   2.170
freq_10_3h_60min_wth 0.032641   0.008980   3.635
freq_10_3h_60min_btw 0.039492   0.061234   0.645
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_60mn_w
sexM          -0.113
age           -0.768 -0.080
ms_expsc_nt   -0.387 -0.052  0.092
r__25010_3_    -0.103 -0.016 -0.014  0.142
frq_10_3h_60mn_w -0.083 -0.014  0.008  0.176  0.316
frq_10_3h_60mn_b -0.335 -0.044 -0.102  0.047  0.085  0.030
```

```
Robustness weights for the residuals:
3454 weights are ~= 1. The remaining 898 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.199  0.584   0.763   0.739  0.918   0.999
```

```
Robustness weights for the random effects:
125 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.509  0.793   0.914   0.874  0.984   0.999
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.88	0.34	[3.21, 4.55]	11.39	< .001
sex [M]	-0.21	0.24	[-0.68, 0.27]	-0.84	0.399
age	-0.03	7.50e-03	[-0.05, -0.02]	-4.33	< .001
ms	0.01	0.02	[-0.03, 0.06]	0.58	0.559
ra sum 250vs10 3h 7d	0.11	0.05	[0.01, 0.21]	2.17	0.030
freq 10 3h 60min wth	0.03	8.98e-03	[0.02, 0.05]	3.63	< .001
freq 10 3h 60min btw	0.04	0.06	[-0.08, 0.16]	0.64	0.519

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	0.56

```
=====
OUTCOME: sleepiness
EXPOSURE: freq_10_3h | 90 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.2648 -0.6156 -0.0218 0.6247 6.7684

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.7920 1.3386
Residual 0.3108 0.5575
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 3.950116 0.326816 12.087
sexM -0.205990 0.243609 -0.846
age -0.032770 0.007508 -4.365
ms 0.004312 0.021517 0.200
ra_sum_250vs10_3h_7d 0.094061 0.049792 1.889
freq_10_3h_90min_wth 0.034204 0.010022 3.413
freq_10_3h_90min_btw 0.054602 0.073197 0.746

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_90mn_w
sexM -0.124
age -0.813 -0.079
ms_expsc_nt -0.386 -0.050 0.094
r__25010_3_ -0.081 -0.015 -0.016 0.112
frq_10_3h_90mn_w -0.048 -0.010 0.004 0.103 0.238
frq_10_3h_90mn_b -0.199 -0.048 -0.110 0.015 0.073 0.013

Robustness weights for the residuals:
3451 weights are ~1. The remaining 901 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.199 0.584 0.766 0.741 0.917 0.999

Robustness weights for the random effects:
126 weights are ~1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.507 0.785 0.917 0.871 0.982 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	3.95	0.33	[3.31, 4.59]	12.09	< .001
sex [M]	-0.21	0.24	[-0.68, 0.27]	-0.85	0.398
age	-0.03	7.51e-03	[-0.05, -0.02]	-4.36	< .001
ms	4.31e-03	0.02	[-0.04, 0.05]	0.20	0.841
ra sum 250vs10 3h 7d	0.09	0.05	[0.00, 0.19]	1.89	0.059
freq 10 3h 90min wth	0.03	0.01	[0.01, 0.05]	3.41	< .001
freq 10 3h 90min btw	0.05	0.07	[-0.09, 0.20]	0.75	0.456

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.34
SD (Residual)	0.56

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_1h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.6108 -0.6146 -0.0079  0.6092  6.2469

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.6633    1.2897
Residual                   0.3184    0.5643
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.739769   0.398026  11.908
sexM            -0.231599   0.231584  -1.000
age            -0.031399   0.007100  -4.422
ms             -0.038622   0.019981  -1.933
freq_250_1h_0min_wth  0.016718   0.007586   2.204
freq_250_1h_0min_btw -0.132474   0.062792  -2.110

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_1h_0mn_w
sexM          -0.202
age           -0.615 -0.072
ms            -0.329 -0.037  0.095
freq_250_1h_0mn_w -0.030 -0.002  0.008  0.093
freq_250_1h_0mn_b -0.645  0.129 -0.065  0.057  0.005

Robustness weights for the residuals:
3716 weights are ~= 1. The remaining 966 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.203  0.579   0.761   0.730  0.912   0.999

Robustness weights for the random effects:
133 weights are ~= 1. The remaining 28 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.523  0.725   0.847   0.827  0.941   0.990

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.74 | 0.40 | [ 3.96, 5.52] | 11.91 | < .001
sex [M] | -0.23 | 0.23 | [-0.69, 0.22] | -1.00 | 0.317
age | -0.03 | 7.10e-03 | [-0.05, -0.02] | -4.42 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -1.93 | 0.053
freq 250 1h 0min wth | 0.02 | 7.59e-03 | [ 0.00, 0.03] | 2.20 | 0.028
freq 250 1h 0min btw | -0.13 | 0.06 | [-0.26, -0.01] | -2.11 | 0.035

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.29
SD (Residual) | 0.56

```



```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_1h | 15 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5967 -0.6122 -0.0182  0.6035  6.2290

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 1.7002   1.3039
 Residual                0.3175   0.5635
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.150905   0.322566  12.868
sexM            -0.185391   0.233698  -0.793
age            -0.032178   0.007184  -4.479
ms             -0.035395   0.019896  -1.779
freq_250_1h_15min_wth -0.037786   0.010255  -3.685
freq_250_1h_15min_btw  0.043144   0.097522   0.442

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_15mn_w
sexM          -0.114
age           -0.842 -0.073
ms            -0.350 -0.040  0.095
frq_250_1h_15mn_w  0.020  0.001 -0.005 -0.059
frq_250_1h_15mn_b -0.307 -0.114  0.079 -0.035  0.002

Robustness weights for the residuals:
3709 weights are ~= 1. The remaining 973 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.204  0.583  0.769  0.730  0.908  0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.503  0.736  0.885  0.850  0.972  0.993

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.15 | 0.32 | [ 3.52, 4.78] | 12.87 | < .001
sex [M] | -0.19 | 0.23 | [-0.64, 0.27] | -0.79 | 0.428
age | -0.03 | 7.18e-03 | [-0.05, -0.02] | -4.48 | < .001
ms | -0.04 | 0.02 | [-0.07, 0.00] | -1.78 | 0.075
freq 250 1h 15min wth | -0.04 | 0.01 | [-0.06, -0.02] | -3.68 | < .001
freq 250 1h 15min btw | 0.04 | 0.10 | [-0.15, 0.23] | 0.44 | 0.658

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.30
SD (Residual) | 0.56

```

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_1h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5842 -0.6117 -0.0181  0.6029  6.2294

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 1.6911   1.3004
Residual                0.3173   0.5633
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.232944   0.318175  13.304
sexM           -0.168084   0.231616  -0.726
age            -0.032756   0.007193  -4.554
ms             -0.035426   0.019899  -1.780
freq_250_1h_30min_wth -0.055587   0.015485  -3.590
freq_250_1h_30min_btw -0.089419   0.185038  -0.483

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_30mn_w
sexM          -0.145
age           -0.855 -0.067
ms            -0.362 -0.044  0.096
frq_250_1h_30mn_w 0.026  0.004 -0.007 -0.074
frq_250_1h_30mn_b -0.271 -0.025  0.118 -0.015  0.000

Robustness weights for the residuals:
3708 weights are ~= 1. The remaining 974 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.204  0.579   0.759   0.730  0.914   0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 36 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.510  0.760   0.939   0.861  0.981   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.23 | 0.32 | [ 3.61, 4.86] | 13.30 | < .001
sex [M] | -0.17 | 0.23 | [-0.62, 0.29] | -0.73 | 0.468
age | -0.03 | 7.19e-03 | [-0.05, -0.02] | -4.55 | < .001
ms | -0.04 | 0.02 | [-0.07, 0.00] | -1.78 | 0.075
freq 250 1h 30min wth | -0.06 | 0.02 | [-0.09, -0.03] | -3.59 | < .001
freq 250 1h 30min btw | -0.09 | 0.19 | [-0.45, 0.27] | -0.48 | 0.629

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.30
SD (Residual) | 0.56

```

```
=====
OUTCOME: sleepiness
EXPOSURE: freq_250_2h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.5900 -0.6170 -0.0094 0.6116 6.1884

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.709 1.3071
Residual 0.318 0.5639
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.336783 0.355593 12.196
sexM -0.189887 0.233711 -0.812
age -0.032461 0.007182 -4.520
ms -0.036900 0.019935 -1.851
freq_250_2h_0min_wth 0.018890 0.007646 2.471
freq_250_2h_0min_btw -0.051898 0.065633 -0.791

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_0mn_w
sexM -0.182
age -0.760 -0.061
ms -0.338 -0.043 0.098
frq_250_2h_0mn_w -0.026 -0.001 0.007 0.081
frq_250_2h_0mn_b -0.501 0.092 0.029 0.019 0.002

Robustness weights for the residuals:
3705 weights are ~= 1. The remaining 977 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.204 0.578 0.761 0.732 0.911 0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.522 0.758 0.894 0.854 0.966 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.34	0.36	[3.64, 5.03]	12.20	< .001
sex [M]	-0.19	0.23	[-0.65, 0.27]	-0.81	0.417
age	-0.03	7.18e-03	[-0.05, -0.02]	-4.52	< .001
ms	-0.04	0.02	[-0.08, 0.00]	-1.85	0.064
freq 250 2h 0min wth	0.02	7.65e-03	[0.00, 0.03]	2.47	0.014
freq 250 2h 0min btw	-0.05	0.07	[-0.18, 0.08]	-0.79	0.429

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.31
SD (Residual)	0.56

```
=====
OUTCOME: sleepiness
EXPOSURE: freq_250_2h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.6062 -0.6224 -0.0145 0.6068 6.1948

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 1.6991 1.3035
Residual 0.3172 0.5632
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 4.232840 0.331318 12.776
sexM -0.164554 0.233334 -0.705
age -0.032523 0.007173 -4.534
ms -0.038672 0.019850 -1.948
freq_250_2h_30min_wth -0.026274 0.008465 -3.104
freq_250_2h_30min_btw -0.013408 0.075653 -0.177

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_30mn_w
sexM -0.106
age -0.820 -0.070
ms -0.343 -0.042 0.096
frq_250_2h_30mn_w 0.006 0.000 -0.001 -0.020
frq_250_2h_30mn_b -0.378 -0.103 0.063 -0.020 0.000

Robustness weights for the residuals:
3717 weights are ~= 1. The remaining 965 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.204 0.577 0.757 0.728 0.904 0.998

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 35 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.512 0.752 0.920 0.858 0.981 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.23	0.33	[3.58, 4.88]	12.78	< .001
sex [M]	-0.16	0.23	[-0.62, 0.29]	-0.71	0.481
age	-0.03	7.17e-03	[-0.05, -0.02]	-4.53	< .001
ms	-0.04	0.02	[-0.08, 0.00]	-1.95	0.051
freq 250 2h 30min wth	-0.03	8.47e-03	[-0.04, -0.01]	-3.10	0.002
freq 250 2h 30min btw	-0.01	0.08	[-0.16, 0.13]	-0.18	0.859

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.30
SD (Residual)	0.56

```
=====
OUTCOME: sleepiness
EXPOSURE: freq_250_2h | 60 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5866 -0.6096 -0.0120  0.6048  6.2118
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept) 1.6897   1.2999
Residual                   0.3172   0.5632
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.272148   0.312867  13.655
sexM            -0.146394   0.232388  -0.630
age            -0.032639   0.007143  -4.569
ms             -0.040464   0.019838  -2.040
freq_250_2h_60min_wth -0.045184   0.013034  -3.467
freq_250_2h_60min_btw -0.101837   0.125479  -0.812
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_2h_60mn_w
sexM          -0.135
age           -0.849 -0.067
ms            -0.369 -0.043  0.097
frq_250_2h_60mn_w  0.000  0.000  0.000  0.000
frq_250_2h_60mn_b -0.208 -0.090  0.031 -0.012  0.001
```

```
Robustness weights for the residuals:
3718 weights are ~= 1. The remaining 964 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.204  0.577   0.760   0.727  0.908   0.999
```

```
Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.517  0.740   0.864   0.847  0.973   0.996
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	4.27	0.31	[3.66, 4.89]	13.65	< .001
sex [M]	-0.15	0.23	[-0.60, 0.31]	-0.63	0.529
age	-0.03	7.14e-03	[-0.05, -0.02]	-4.57	< .001
ms	-0.04	0.02	[-0.08, 0.00]	-2.04	0.041
freq 250 2h 60min wth	-0.05	0.01	[-0.07, -0.02]	-3.47	< .001
freq 250 2h 60min btw	-0.10	0.13	[-0.35, 0.14]	-0.81	0.417

Random Effects

Parameter	Coefficient
SD (Intercept: id)	1.30
SD (Residual)	0.56

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_2h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.5715 -0.6094 -0.0067  0.6056  6.2225

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.6912   1.3005
Residual                0.3185   0.5643
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.232720   0.308128  13.737
sexM            -0.161928   0.232392  -0.697
age            -0.032592   0.007144  -4.562
ms             -0.040108   0.019883  -2.017
freq_250_2h_90min_wth -0.054971  0.029955  -1.835
freq_250_2h_90min_btw -0.152718  0.372458  -0.410

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_2h_90mn_w
sexM          -0.146
age           -0.858 -0.066
ms            -0.378 -0.045  0.098
freq_250_2h_90mn_w  0.010  0.002 -0.002 -0.027
freq_250_2h_90mn_b -0.110 -0.085  0.020 -0.001 -0.001

Robustness weights for the residuals:
3705 weights are ~= 1. The remaining 977 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.205  0.580  0.764  0.733  0.916  0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.509  0.743  0.914  0.853  0.975  0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.23 | 0.31 | [ 3.63, 4.84] | 13.74 | < .001
sex [M] | -0.16 | 0.23 | [-0.62, 0.29] | -0.70 | 0.486
age | -0.03 | 7.14e-03 | [-0.05, -0.02] | -4.56 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -2.02 | 0.044
freq 250 2h 90min wth | -0.05 | 0.03 | [-0.11, 0.00] | -1.84 | 0.067
freq 250 2h 90min btw | -0.15 | 0.37 | [-0.88, 0.58] | -0.41 | 0.682

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.30
SD (Residual) | 0.56

```

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.6276 -0.6187 -0.0130  0.6090  6.1768

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.7052   1.306
Residual                   0.3181   0.564
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.227448   0.346158  12.212
sexM            -0.170322   0.232938  -0.731
age            -0.032547   0.007207  -4.516
ms             -0.038790   0.019900  -1.949
freq_250_3h_0min_wth  0.018762   0.008756   2.143
freq_250_3h_0min_btw -0.007308   0.075034  -0.097

Correlation of Fixed Effects:
              (Intr) sexM    age    ms_xp_ freq_250_3h_0mn_w
sexM          -0.168
age           -0.807 -0.058
ms            -0.337 -0.044  0.097
freq_250_3h_0mn_w -0.016  0.000  0.003  0.055
freq_250_3h_0mn_b -0.460  0.061  0.099  0.002  0.002

Robustness weights for the residuals:
3698 weights are ~= 1. The remaining 984 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.203  0.579  0.765  0.734  0.921  0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 34 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.511  0.744  0.894  0.855  0.976  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.23 | 0.35 | [ 3.55, 4.91] | 12.21 | < .001
sex [M] | -0.17 | 0.23 | [-0.63, 0.29] | -0.73 | 0.465
age | -0.03 | 7.21e-03 | [-0.05, -0.02] | -4.52 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -1.95 | 0.051
freq 250 3h 0min wth | 0.02 | 8.76e-03 | [ 0.00, 0.04] | 2.14 | 0.032
freq 250 3h 0min btw | -7.31e-03 | 0.08 | [-0.15, 0.14] | -0.10 | 0.922

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.31
SD (Residual) | 0.56

```

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_3h | 120 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5710 -0.6147 -0.0113  0.6059  6.2211

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.6862   1.2985
Residual                0.3185   0.5644
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.253909   0.312707  13.604
sexM            -0.155572   0.232032  -0.670
age            -0.032852   0.007157  -4.590
ms             -0.039641   0.019884  -1.994
freq_250_3h_120min_wth -0.037052   0.019144  -1.935
freq_250_3h_120min_btw -0.122414   0.207687  -0.589

Correlation of Fixed Effects:
              (Intr) sexM    age    ms_xp_ freq_250_3h_120mn_w
sexM          -0.136
age           -0.857 -0.071
ms            -0.369 -0.043  0.097
freq_250_3h_120mn_w  0.009  0.001 -0.002 -0.025
freq_250_3h_120mn_b -0.208 -0.084  0.083 -0.015  0.001

Robustness weights for the residuals:
3708 weights are ~= 1. The remaining 974 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.205  0.578  0.764  0.732  0.920  0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.510  0.737  0.868  0.842  0.970  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.25 | 0.31 | [ 3.64, 4.87] | 13.60 | < .001
sex [M] | -0.16 | 0.23 | [-0.61, 0.30] | -0.67 | 0.503
age | -0.03 | 7.16e-03 | [-0.05, -0.02] | -4.59 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -1.99 | 0.046
freq 250 3h 120min wth | -0.04 | 0.02 | [-0.07, 0.00] | -1.94 | 0.053
freq 250 3h 120min btw | -0.12 | 0.21 | [-0.53, 0.28] | -0.59 | 0.556

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.30
SD (Residual) | 0.56

```



```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_3h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.6254 -0.6224 -0.0140  0.6022  6.2445

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)  1.6914   1.3005
Residual                0.3166   0.5627
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.294682   0.337883  12.711
sexM            -0.147058   0.232432  -0.633
age            -0.032018   0.007150  -4.478
ms             -0.037074   0.019827  -1.870
freq_250_3h_30min_wth -0.030046   0.007795  -3.854
freq_250_3h_30min_btw -0.042337   0.061652  -0.687

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_30mn_w
sexM          -0.106
age           -0.761 -0.060
ms            -0.345 -0.045  0.098
frq_250_3h_30mn_w  0.007  0.000 -0.002 -0.024
frq_250_3h_30mn_b -0.423 -0.086 -0.045  0.003  0.000

Robustness weights for the residuals:
3704 weights are ~= 1. The remaining 978 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.203  0.571  0.760  0.731  0.911  0.999

Robustness weights for the random effects:
124 weights are ~= 1. The remaining 37 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.525  0.755  0.945  0.866  0.989  0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.29 | 0.34 | [ 3.63, 4.96] | 12.71 | < .001
sex [M] | -0.15 | 0.23 | [-0.60, 0.31] | -0.63 | 0.527
age | -0.03 | 7.15e-03 | [-0.05, -0.02] | -4.48 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -1.87 | 0.062
freq 250 3h 30min wth | -0.03 | 7.80e-03 | [-0.05, -0.01] | -3.85 | < .001
freq 250 3h 30min btw | -0.04 | 0.06 | [-0.16, 0.08] | -0.69 | 0.492

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.30
SD (Residual) | 0.56

```

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.6164 -0.6194 -0.0128  0.6097  6.1946

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7025    1.305
Residual                   0.3158    0.562
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.242460   0.322525  13.154
sexM            -0.161087   0.233707  -0.689
age            -0.032487   0.007167  -4.533
ms             -0.040722   0.019803  -2.056
freq_250_3h_60min_wth -0.037541  0.009336  -4.021
freq_250_3h_60min_btw -0.017658  0.076227  -0.232

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_3h_60mn_w
sexM          -0.116
age           -0.825 -0.066
ms            -0.359 -0.044  0.097
freq_250_3h_60mn_w -0.005 -0.001  0.002  0.013
freq_250_3h_60mn_b -0.307 -0.109  0.016 -0.001  0.000

Robustness weights for the residuals:
3711 weights are ~= 1. The remaining 971 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.203  0.573   0.751   0.727  0.908   0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 36 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.513  0.756   0.936   0.862  0.980   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.24 | 0.32 | [ 3.61, 4.87] | 13.15 | < .001
sex [M] | -0.16 | 0.23 | [-0.62, 0.30] | -0.69 | 0.491
age | -0.03 | 7.17e-03 | [-0.05, -0.02] | -4.53 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -2.06 | 0.040
freq 250 3h 60min wth | -0.04 | 9.34e-03 | [-0.06, -0.02] | -4.02 | < .001
freq 250 3h 60min btw | -0.02 | 0.08 | [-0.17, 0.13] | -0.23 | 0.817

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.30
SD (Residual) | 0.56

```

```

=====
OUTCOME: sleepiness
EXPOSURE: freq_250_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.5976 -0.6107 -0.0114  0.6061  6.2246

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    1.7009    1.3042
Residual                   0.3162    0.5623
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    4.247277   0.316705  13.411
sexM            -0.162209   0.233161  -0.696
age            -0.032643   0.007173  -4.550
ms             -0.041434   0.019820  -2.091
freq_250_3h_90min_wth -0.043322  0.011547  -3.752
freq_250_3h_90min_btw -0.030794  0.108552  -0.284

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_3h_90mn_w
sexM          -0.130
age           -0.847 -0.069
ms            -0.364 -0.044  0.097
frq_250_3h_90mn_w -0.010 -0.002  0.003  0.027
frq_250_3h_90mn_b -0.247 -0.090  0.055 -0.009  0.001

Robustness weights for the residuals:
3716 weights are ~= 1. The remaining 966 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.204  0.574  0.762  0.727  0.904  0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 35 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.511  0.749  0.947  0.859  0.977  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 4.25 | 0.32 | [ 3.63, 4.87] | 13.41 | < .001
sex [M] | -0.16 | 0.23 | [-0.62, 0.29] | -0.70 | 0.487
age | -0.03 | 7.17e-03 | [-0.05, -0.02] | -4.55 | < .001
ms | -0.04 | 0.02 | [-0.08, 0.00] | -2.09 | 0.037
freq 250 3h 90min wth | -0.04 | 0.01 | [-0.07, -0.02] | -3.75 | < .001
freq 250 3h 90min btw | -0.03 | 0.11 | [-0.24, 0.18] | -0.28 | 0.777

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 1.30
SD (Residual) | 0.56

```

```

=====
OUTCOME: who5
EXPOSURE: fffreq_1 | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.5493 -0.5945  0.0245  0.5905  7.4682

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.088    4.253
Residual                2.557    1.599
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    12.05822    1.71062   7.049
sexM            2.37086    0.77236   3.070
age             0.06593    0.02530   2.606
ms            -0.35432    0.06227  -5.690
ra_sum_250vs1_7d 0.66434    0.18779   3.538
fffreq_1_0min_wth 0.04292    0.02434   1.763
fffreq_1_0min_btw -0.07017    0.24286  -0.289

Correlation of Fixed Effects:
              (Intr) sexM   age   ms_xp_ r__250 fffrq_1_0mn_w
sexM          -0.098
age          -0.759 -0.072
ms_expsc_nt  -0.193 -0.046  0.074
r_sm_250l_7  -0.068 -0.005  0.001  0.077
fffrq_1_0mn_w 0.042  0.010 -0.006 -0.151 -0.311
fffrq_1_0mn_b -0.804  0.019  0.352 -0.030 -0.047  0.022

Robustness weights for the residuals:
3413 weights are ~= 1. The remaining 939 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.180  0.581  0.748  0.726  0.897  0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.460  0.766  0.891  0.842  0.965  0.995

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 12.06 | 1.71 | [ 8.70, 15.41] | 7.05 | < .001
sex [M] | 2.37 | 0.77 | [ 0.86, 3.89] | 3.07 | 0.002
age | 0.07 | 0.03 | [ 0.02, 0.12] | 2.61 | 0.009
ms | -0.35 | 0.06 | [-0.48, -0.23] | -5.69 | < .001
ra_sum_250vs1_7d | 0.66 | 0.19 | [ 0.30, 1.03] | 3.54 | < .001
fffreq_1_0min_wth | 0.04 | 0.02 | [ 0.00, 0.09] | 1.76 | 0.078
fffreq_1_0min_btw | -0.07 | 0.24 | [-0.55, 0.41] | -0.29 | 0.773

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.25
SD (Residual) | 1.60

```

```
=====
OUTCOME: who5
EXPOSURE: fffreq_1 | 15 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5092 -0.5984 0.0208 0.5956 7.4622

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 18.039 4.247
Residual 2.546 1.596
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.85176 1.01671 11.657
sexM 2.35588 0.77206 3.051
age 0.08185 0.02570 3.185
ms -0.35721 0.06172 -5.788
ra_sum_250vs1_7d 0.50836 0.19602 2.593
fffreq_1_15min_wth -0.10726 0.03395 -3.159
fffreq_1_15min_btw -0.54727 0.38071 -1.437

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 fffrq_1_15mn_w
sexM -0.138
age -0.777 -0.058
ms_expsc_nt -0.362 -0.045 0.075
r_sm_250l_7 -0.182 -0.006 -0.007 0.070
fffrq_1_15mn_w -0.101 -0.007 0.002 0.099 0.416
fffrq_1_15mn_b -0.020 -0.049 -0.392 0.021 0.061 0.025

Robustness weights for the residuals:
3412 weights are ~= 1. The remaining 940 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.180 0.582 0.746 0.725 0.895 0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.461 0.732 0.919 0.853 0.973 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	11.85	1.02	[9.86, 13.85]	11.66	< .001
sex [M]	2.36	0.77	[0.84, 3.87]	3.05	0.002
age	0.08	0.03	[0.03, 0.13]	3.19	0.001
ms	-0.36	0.06	[-0.48, -0.24]	-5.79	< .001
ra_sum_250vs1_7d	0.51	0.20	[0.12, 0.89]	2.59	0.010
fffreq_1_15min_wth	-0.11	0.03	[-0.17, -0.04]	-3.16	0.002
fffreq_1_15min_btw	-0.55	0.38	[-1.29, 0.20]	-1.44	0.151

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.25
SD (Residual)	1.60

```

=====
OUTCOME: who5
EXPOSURE: fffreq_1 | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min      1Q  Median      3Q      Max
-5.5600 -0.5970  0.0212  0.5911  7.4261

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.639    4.200
Residual                   2.558    1.599
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    11.30894    1.01417   11.151
sexM            2.29661    0.76265    3.011
age             0.09139    0.02579    3.543
ms            -0.34385    0.06180   -5.564
ra_sum_250vs1_7d 0.68825    0.19733    3.488
fffreq_1_30min_wth -0.03109    0.04690   -0.663
fffreq_1_30min_btw -1.07168    0.53126   -2.017

Correlation of Fixed Effects:
              (Intr) sexM   age   ms_xp_ r__250 fffrq_1_30mn_w
sexM          -0.138
age          -0.816 -0.077
ms_expsc_nt  -0.361 -0.045  0.077
r_sm_250l_7   -0.175 -0.003 -0.011  0.070
fffreq_1_30mn_w -0.099 -0.005  0.000  0.098  0.425
fffreq_1_30mn_b 0.115  0.003 -0.422  0.013  0.066  0.025

Robustness weights for the residuals:
3408 weights are ~= 1. The remaining 944 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.181  0.585   0.749   0.727  0.895   0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 25 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.460  0.717   0.892   0.827  0.964   0.992

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 11.31 | 1.01 | [ 9.32, 13.30] | 11.15 | < .001
sex [M] | 2.30 | 0.76 | [ 0.80, 3.79] | 3.01 | 0.003
age | 0.09 | 0.03 | [ 0.04, 0.14] | 3.54 | < .001
ms | -0.34 | 0.06 | [-0.47, -0.22] | -5.56 | < .001
ra_sum_250vs1_7d | 0.69 | 0.20 | [ 0.30, 1.08] | 3.49 | < .001
fffreq_1_30min_wth | -0.03 | 0.05 | [-0.12, 0.06] | -0.66 | 0.507
fffreq_1_30min_btw | -1.07 | 0.53 | [-2.11, -0.03] | -2.02 | 0.044

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.20
SD (Residual) | 1.60

```

```

=====
OUTCOME: who5
EXPOSURE: freq_10_3h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.5318 -0.5974  0.0269  0.5871  7.2880

Random effects:
 Groups   Name      Variance Std.Dev.
 id       (Intercept) 18.354   4.284
 Residual                2.571   1.603
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    11.880338    1.089660   10.903
sexM             2.307909    0.782621    2.949
age              0.067271    0.024039    2.798
ms             -0.323290    0.062129   -5.203
ra_sum_250vs10_3h_7d 0.527719    0.141589    3.727
freq_10_3h_0min_wth -0.008965    0.034727   -0.258
freq_10_3h_0min_btw  0.060030    0.341988    0.176

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_0mn_w
sexM          -0.089
age          -0.841 -0.097
ms_expsc_nt   -0.312 -0.039  0.080
r__25010_3_   -0.036 -0.004 -0.013  0.101
frq_10_3h_0mn_w 0.016  0.003  0.001 -0.063 -0.185
frq_10_3h_0mn_b -0.376 -0.110  0.128 -0.050 -0.048  0.044

Robustness weights for the residuals:
3424 weights are ~= 1. The remaining 928 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.185  0.583   0.742   0.725  0.891   0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.471  0.769   0.901   0.849  0.987   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 11.88 | 1.09 | [ 9.74, 14.02] | 10.90 | < .001
sex [M] | 2.31 | 0.78 | [ 0.77, 3.84] | 2.95 | 0.003
age | 0.07 | 0.02 | [ 0.02, 0.11] | 2.80 | 0.005
ms | -0.32 | 0.06 | [-0.45, -0.20] | -5.20 | < .001
ra sum 250vs10 3h 7d | 0.53 | 0.14 | [ 0.25, 0.81] | 3.73 | < .001
freq 10 3h 0min wth | -8.96e-03 | 0.03 | [-0.08, 0.06] | -0.26 | 0.796
freq 10 3h 0min btw | 0.06 | 0.34 | [-0.61, 0.73] | 0.18 | 0.861

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.28
SD (Residual) | 1.60

```

```
=====
OUTCOME: who5
EXPOSURE: freq_10_3h | 120 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-5.5681 -0.5975 0.0285 0.5890 7.3495

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 18.165 4.262
Residual 2.574 1.604
Number of obs: 4352, groups: id, 156

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.81679 1.00816 11.721
sexM 2.23023 0.77734 2.869
age 0.06187 0.02401 2.577
ms -0.31671 0.06214 -5.097
ra_sum_250vs10_3h_7d 0.57345 0.14077 4.074
freq_10_3h_120min_wth 0.06670 0.03693 1.806
freq_10_3h_120min_btw 0.41856 0.34668 1.207

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_r__250 frq_10_3h_120mn_w
sexM -0.133
age -0.837 -0.068
ms_expsc_nt -0.358 -0.045 0.087
r__25010_3_ -0.061 -0.014 -0.016 0.099
frq_10_3h_120mn_w -0.030 -0.007 0.003 0.077 0.143
frq_10_3h_120mn_b -0.080 -0.094 -0.154 -0.001 0.054 0.000

Robustness weights for the residuals:
3418 weights are ~= 1. The remaining 934 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.183 0.588 0.744 0.727 0.892 0.999

Robustness weights for the random effects:
125 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.470 0.786 0.903 0.856 0.971 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4344)	p
(Intercept)	11.82	1.01	[9.84, 13.79]	11.72	< .001
sex [M]	2.23	0.78	[0.71, 3.75]	2.87	0.004
age	0.06	0.02	[0.01, 0.11]	2.58	0.010
ms	-0.32	0.06	[-0.44, -0.19]	-5.10	< .001
ra_sum_250vs10_3h_7d	0.57	0.14	[0.30, 0.85]	4.07	< .001
freq_10_3h_120min_wth	0.07	0.04	[-0.01, 0.14]	1.81	0.071
freq_10_3h_120min_btw	0.42	0.35	[-0.26, 1.10]	1.21	0.227

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.26
SD (Residual)	1.60


```

=====
OUTCOME: who5
EXPOSURE: freq_10_3h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.6328 -0.5986  0.0210  0.5858  7.2414

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)      18.383    4.288
Residual                   2.565    1.602
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    11.47567    1.18344   9.697
sexM             2.29171    0.77864   2.943
age              0.06673    0.02395   2.786
ms             -0.27836    0.06332  -4.396
ra_sum_250vs10_3h_7d 0.72513    0.15001   4.834
freq_10_3h_30min_wth 0.09193    0.02525   3.640
freq_10_3h_30min_btw 0.05745    0.18086   0.318

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_30mn_w
sexM          -0.111
age          -0.690 -0.082
ms_expsc_nt   -0.345 -0.047  0.082
r__25010_3_    -0.114 -0.014 -0.011  0.161
frq_10_3h_30mn_w -0.093 -0.014  0.007  0.205  0.371
frq_10_3h_30mn_b -0.517 -0.018 -0.087  0.064  0.088  0.041

Robustness weights for the residuals:
3418 weights are ~= 1. The remaining 934 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.186  0.584   0.743   0.726  0.893   0.999

Robustness weights for the random effects:
127 weights are ~= 1. The remaining 29 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.472  0.777   0.886   0.850  0.975   0.998

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 11.48 | 1.18 | [ 9.16, 13.80] | 9.70 | < .001
sex [M] | 2.29 | 0.78 | [ 0.77, 3.82] | 2.94 | 0.003
age | 0.07 | 0.02 | [ 0.02, 0.11] | 2.79 | 0.005
ms | -0.28 | 0.06 | [-0.40, -0.15] | -4.40 | < .001
ra sum 250vs10 3h 7d | 0.73 | 0.15 | [ 0.43, 1.02] | 4.83 | < .001
freq 10 3h 30min wth | 0.09 | 0.03 | [ 0.04, 0.14] | 3.64 | < .001
freq 10 3h 30min btw | 0.06 | 0.18 | [-0.30, 0.41] | 0.32 | 0.751

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.29
SD (Residual) | 1.60

```

```

=====
OUTCOME: who5
EXPOSURE: freq_10_3h | 60 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.6718 -0.5979  0.0230  0.5808  7.2421

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.403    4.290
Residual                2.577    1.605
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    11.48130    1.07529   10.677
sexM             2.26309    0.77964    2.903
age              0.06567    0.02400    2.736
ms             -0.28257    0.06305   -4.482
ra_sum_250vs10_3h_7d 0.69776    0.14714    4.742
freq_10_3h_60min_wth 0.09010    0.02589    3.480
freq_10_3h_60min_btw 0.12351    0.19595    0.630

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_60mn_w
sexM          -0.118
age          -0.773 -0.079
ms_expsc_nt   -0.356 -0.047  0.083
r__25010_3_   -0.094 -0.015 -0.013  0.141
frq_10_3h_60mn_w -0.077 -0.012  0.007  0.176  0.317
frq_10_3h_60mn_b -0.336 -0.043 -0.103  0.043  0.077  0.027

Robustness weights for the residuals:
3423 weights are ~= 1. The remaining 929 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.186  0.586   0.745   0.726  0.890   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.472  0.780   0.913   0.855  0.977   0.996

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 11.48 | 1.08 | [ 9.37, 13.59] | 10.68 | < .001
sex [M] | 2.26 | 0.78 | [ 0.73, 3.79] | 2.90 | 0.004
age | 0.07 | 0.02 | [ 0.02, 0.11] | 2.74 | 0.006
ms | -0.28 | 0.06 | [-0.41, -0.16] | -4.48 | < .001
ra sum 250vs10 3h 7d | 0.70 | 0.15 | [ 0.41, 0.99] | 4.74 | < .001
freq 10 3h 60min wth | 0.09 | 0.03 | [ 0.04, 0.14] | 3.48 | < .001
freq 10 3h 60min btw | 0.12 | 0.20 | [-0.26, 0.51] | 0.63 | 0.529

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.29
SD (Residual) | 1.61

```

```

=====
OUTCOME: who5
EXPOSURE: freq_10_3h | 90 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-5.5344 -0.5975  0.0283  0.5911  7.2899

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    18.216   4.268
Residual                   2.573   1.604
Number of obs: 4352, groups: id, 156

Fixed effects:
              Estimate Std. Error t value
(Intercept)    11.69969    1.02727   11.389
sexM             2.26993    0.77584    2.926
age              0.06329    0.02390    2.649
ms             -0.31913    0.06228   -5.124
ra_sum_250vs10_3h_7d 0.55584    0.14352    3.873
freq_10_3h_90min_wth 0.01536    0.02884    0.533
freq_10_3h_90min_btw 0.26940    0.23309    1.156

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ r__250 frq_10_3h_90mn_w
sexM          -0.129
age          -0.818 -0.078
ms_expsc_nt   -0.355 -0.046  0.086
r__25010_3_   -0.074 -0.013 -0.014  0.111
frq_10_3h_90mn_w -0.045 -0.009  0.004  0.104  0.239
frq_10_3h_90mn_b -0.200 -0.047 -0.110  0.014  0.066  0.012

Robustness weights for the residuals:
3424 weights are ~= 1. The remaining 928 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.185  0.585   0.740   0.725  0.891   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 30 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.472  0.783   0.911   0.852  0.965   0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4344) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 11.70 | 1.03 | [ 9.69, 13.71] | 11.39 | < .001
sex [M] | 2.27 | 0.78 | [ 0.75, 3.79] | 2.93 | 0.003
age | 0.06 | 0.02 | [ 0.02, 0.11] | 2.65 | 0.008
ms | -0.32 | 0.06 | [-0.44, -0.20] | -5.12 | < .001
ra sum 250vs10 3h 7d | 0.56 | 0.14 | [ 0.27, 0.84] | 3.87 | < .001
freq 10 3h 90min wth | 0.02 | 0.03 | [-0.04, 0.07] | 0.53 | 0.594
freq 10 3h 90min btw | 0.27 | 0.23 | [-0.19, 0.73] | 1.16 | 0.248

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.27
SD (Residual) | 1.60

```

```

=====
OUTCOME: who5
EXPOSURE: freq_250_1h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3549 -0.5959  0.0023  0.5887  5.2276

Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.492    4.182
Residual                2.717    1.648
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    12.87925    1.27733   10.083
sexM             2.15778    0.75023    2.876
age              0.06651    0.02299    2.893
ms             -0.28863    0.05871   -4.916
freq_250_1h_0min_wth -0.12699    0.02216   -5.731
freq_250_1h_0min_btw -0.20098    0.20339   -0.988

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_1h_0mn_w
sexM          -0.206
age           -0.616 -0.071
ms            -0.302 -0.034  0.086
freq_250_1h_0mn_w -0.027 -0.002  0.007  0.093
freq_250_1h_0mn_b -0.648  0.129 -0.066  0.051  0.005

Robustness weights for the residuals:
3672 weights are ~= 1. The remaining 1010 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.212  0.568   0.749   0.725  0.899   0.999

Robustness weights for the random effects:
126 weights are ~= 1. The remaining 35 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.469  0.773   0.880   0.854  0.987   0.999

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 12.88 | 1.28 | [10.38, 15.38] | 10.08 | < .001
sex [M] | 2.16 | 0.75 | [ 0.69, 3.63] | 2.88 | 0.004
age | 0.07 | 0.02 | [ 0.02, 0.11] | 2.89 | 0.004
ms | -0.29 | 0.06 | [-0.40, -0.17] | -4.92 | < .001
freq 250 1h 0min wth | -0.13 | 0.02 | [-0.17, -0.08] | -5.73 | < .001
freq 250 1h 0min btw | -0.20 | 0.20 | [-0.60, 0.20] | -0.99 | 0.323

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.18
SD (Residual) | 1.65

```

```
=====
OUTCOME: who5
EXPOSURE: freq_250_1h | 15 min
=====
```

----- SUMMARY -----

```
Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")
```

```
Scaled residuals:
    Min      1Q  Median      3Q      Max
-6.4163 -0.5983  0.0109  0.5924  5.3240
```

```
Random effects:
Groups   Name             Variance Std.Dev.
id       (Intercept)    17.579    4.193
Residual                2.722    1.650
Number of obs: 4682, groups: id, 161
```

```
Fixed effects:
              Estimate Std. Error t value
(Intercept)    11.66870    1.02611  11.372
sexM            2.14634    0.75073   2.859
age             0.06739    0.02307   2.921
ms            -0.27355    0.05857  -4.670
freq_250_1h_15min_wth 0.17482    0.03003   5.822
freq_250_1h_15min_btw 0.31454    0.31331   1.004
```

```
Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ frq_250_1h_15mn_w
sexM          -0.117
age          -0.845 -0.072
ms          -0.324 -0.037  0.087
frq_250_1h_15mn_w 0.019  0.001 -0.005 -0.059
frq_250_1h_15mn_b -0.312 -0.115  0.079 -0.032  0.002
```

```
Robustness weights for the residuals:
3681 weights are ~= 1. The remaining 1001 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.210  0.564  0.748  0.725  0.913  0.999
```

```
Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.464  0.772  0.868  0.842  0.959  0.998
```

```
Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
```

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.67	1.03	[9.66, 13.68]	11.37	< .001
sex [M]	2.15	0.75	[0.67, 3.62]	2.86	0.004
age	0.07	0.02	[0.02, 0.11]	2.92	0.004
ms	-0.27	0.06	[-0.39, -0.16]	-4.67	< .001
freq 250 1h 15min wth	0.17	0.03	[0.12, 0.23]	5.82	< .001
freq 250 1h 15min btw	0.31	0.31	[-0.30, 0.93]	1.00	0.315

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.19
SD (Residual)	1.65

=====
OUTCOME: who5
EXPOSURE: freq_250_1h | 30 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3480 -0.5983 0.0110 0.5935 5.2214

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.60 4.195
Residual 2.71 1.646
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.72666 1.01418 11.563
sexM 2.22321 0.74642 2.979
age 0.06843 0.02317 2.954
ms -0.27548 0.05849 -4.710
freq_250_1h_30min_wth 0.32917 0.04526 7.274
freq_250_1h_30min_btw 0.57263 0.59653 0.960

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_1h_30mn_w
sexM -0.149
age -0.860 -0.066
ms -0.334 -0.041 0.087
frq_250_1h_30mn_w 0.024 0.003 -0.006 -0.075
frq_250_1h_30mn_b -0.275 -0.025 0.118 -0.014 0.000

Robustness weights for the residuals:
3673 weights are ~= 1. The remaining 1009 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.212 0.566 0.750 0.728 0.921 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.461 0.768 0.856 0.835 0.959 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
(Intercept) | 11.73 | 1.01 | [9.74, 13.71] | 11.56 | < .001
sex [M] | 2.22 | 0.75 | [0.76, 3.69] | 2.98 | 0.003
age | 0.07 | 0.02 | [0.02, 0.11] | 2.95 | 0.003
ms | -0.28 | 0.06 | [-0.39, -0.16] | -4.71 | < .001
freq 250 1h 30min wth | 0.33 | 0.05 | [0.24, 0.42] | 7.27 | < .001
freq 250 1h 30min btw | 0.57 | 0.60 | [-0.60, 1.74] | 0.96 | 0.337

Random Effects

Parameter | Coefficient
SD (Intercept: id) | 4.20
SD (Residual) | 1.65

```

=====
OUTCOME: who5
EXPOSURE: freq_250_2h | 0 min
=====

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
  Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
    Min       1Q   Median       3Q      Max
-6.3135 -0.5943  0.0134  0.5954  5.1927

Random effects:
  Groups   Name      Variance Std.Dev.
id        (Intercept) 17.456   4.178
Residual                2.734   1.654
Number of obs: 4682, groups: id, 161

Fixed effects:
              Estimate Std. Error t value
(Intercept)    12.58611    1.12623   11.175
sexM             2.16517    0.74637    2.901
age             0.06606    0.02292    2.882
ms            -0.25718    0.05875   -4.377
freq_250_2h_0min_wth -0.03744    0.02242   -1.670
freq_250_2h_0min_btw -0.26740    0.20961   -1.276

Correlation of Fixed Effects:
              (Intr) sexM   age    ms_xp_ freq_250_2h_0mn_w
sexM          -0.186
age           -0.762 -0.061
ms            -0.314 -0.039  0.091
freq_250_2h_0mn_w -0.024 -0.001  0.006  0.081
freq_250_2h_0mn_b -0.505  0.092  0.029  0.018  0.002

Robustness weights for the residuals:
3671 weights are ~= 1. The remaining 1011 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.213  0.568  0.751  0.726  0.907  0.999

Robustness weights for the random effects:
130 weights are ~= 1. The remaining 31 ones are summarized as
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.471  0.745  0.869  0.839  0.962  0.997

Rho functions used for fitting:
Residuals:
  eff: smoothed Huber (k = 1.345, s = 10)
  sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
  eff: smoothed Huber (k = 1.345, s = 10)
  vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

# Fixed Effects

Parameter | Coefficient | SE | 95% CI | t(4675) | p
-----|-----|-----|-----|-----|-----
(Intercept) | 12.59 | 1.13 | [10.38, 14.79] | 11.18 | < .001
sex [M] | 2.17 | 0.75 | [ 0.70, 3.63] | 2.90 | 0.004
age | 0.07 | 0.02 | [ 0.02, 0.11] | 2.88 | 0.004
ms | -0.26 | 0.06 | [-0.37, -0.14] | -4.38 | < .001
freq 250 2h 0min wth | -0.04 | 0.02 | [-0.08, 0.01] | -1.67 | 0.095
freq 250 2h 0min btw | -0.27 | 0.21 | [-0.68, 0.14] | -1.28 | 0.202

# Random Effects

Parameter | Coefficient
-----|-----
SD (Intercept: id) | 4.18
SD (Residual) | 1.65

```

```
=====
OUTCOME: who5
EXPOSURE: freq_250_2h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.5046 -0.5963 0.0090 0.5972 5.1585

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.62 4.197
Residual 2.69 1.640
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.48384 1.05516 10.884
sexM 2.14133 0.75056 2.853
age 0.06733 0.02306 2.920
ms -0.26578 0.05814 -4.572
freq_250_2h_30min_wth 0.18365 0.02465 7.450
freq_250_2h_30min_btw 0.29316 0.24342 1.204

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_30mn_w
sexM -0.110
age -0.823 -0.069
ms -0.315 -0.038 0.088
frq_250_2h_30mn_w 0.006 0.000 -0.001 -0.020
frq_250_2h_30mn_b -0.383 -0.103 0.063 -0.019 0.000

Robustness weights for the residuals:
3673 weights are ~= 1. The remaining 1009 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.207 0.565 0.744 0.725 0.903 0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.464 0.770 0.874 0.849 0.959 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.48	1.06	[9.42, 13.55]	10.88	< .001
sex [M]	2.14	0.75	[0.67, 3.61]	2.85	0.004
age	0.07	0.02	[0.02, 0.11]	2.92	0.004
ms	-0.27	0.06	[-0.38, -0.15]	-4.57	< .001
freq 250 2h 30min wth	0.18	0.02	[0.14, 0.23]	7.45	< .001
freq 250 2h 30min btw	0.29	0.24	[-0.18, 0.77]	1.20	0.229

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.20
SD (Residual)	1.64


```
=====
OUTCOME: who5
EXPOSURE: freq_250_2h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4163 -0.5986 0.0097 0.5833 5.3339

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.615 4.197
Residual 2.689 1.640
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.67500 0.99720 11.708
sexM 2.15559 0.74952 2.876
age 0.06685 0.02303 2.903
ms -0.24602 0.05811 -4.233
freq_250_2h_60min_wth 0.27363 0.03795 7.210
freq_250_2h_60min_btw 0.35436 0.40481 0.875

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_60mn_w
sexM -0.139
age -0.854 -0.066
ms -0.339 -0.039 0.089
frq_250_2h_60mn_w 0.000 0.000 0.000 0.000
frq_250_2h_60mn_b -0.211 -0.090 0.031 -0.011 0.001

Robustness weights for the residuals:
3666 weights are ~= 1. The remaining 1016 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.210 0.561 0.745 0.726 0.910 0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.458 0.771 0.888 0.847 0.957 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.68	1.00	[9.72, 13.63]	11.71	< .001
sex [M]	2.16	0.75	[0.69, 3.63]	2.88	0.004
age	0.07	0.02	[0.02, 0.11]	2.90	0.004
ms	-0.25	0.06	[-0.36, -0.13]	-4.23	< .001
freq 250 2h 60min wth	0.27	0.04	[0.20, 0.35]	7.21	< .001
freq 250 2h 60min btw	0.35	0.40	[-0.44, 1.15]	0.88	0.381

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.20
SD (Residual)	1.64

```
=====
OUTCOME: who5
EXPOSURE: freq_250_2h | 90 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3282 -0.5950 0.0058 0.5905 5.3536

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.774 4.216
Residual 2.721 1.649
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.85031 0.98544 12.025
sexM 2.18102 0.75257 2.898
age 0.06637 0.02312 2.870
ms -0.25527 0.05847 -4.366
freq_250_2h_90min_wth 0.63152 0.08755 7.213
freq_250_2h_90min_btw 0.55152 1.20670 0.457

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_2h_90mn_w
sexM -0.151
age -0.863 -0.065
ms -0.347 -0.040 0.089
frq_250_2h_90mn_w 0.009 0.001 -0.002 -0.028
frq_250_2h_90mn_b -0.111 -0.085 0.020 -0.001 -0.001

Robustness weights for the residuals:
3680 weights are ~= 1. The remaining 1002 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.213 0.570 0.750 0.726 0.905 0.999

Robustness weights for the random effects:
131 weights are ~= 1. The remaining 30 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.459 0.754 0.863 0.833 0.944 0.995

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.85	0.99	[9.92, 13.78]	12.03	< .001
sex [M]	2.18	0.75	[0.71, 3.66]	2.90	0.004
age	0.07	0.02	[0.02, 0.11]	2.87	0.004
ms	-0.26	0.06	[-0.37, -0.14]	-4.37	< .001
freq 250 2h 90min wth	0.63	0.09	[0.46, 0.80]	7.21	< .001
freq 250 2h 90min btw	0.55	1.21	[-1.81, 2.92]	0.46	0.648

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.22
SD (Residual)	1.65

```
=====
OUTCOME: who5
EXPOSURE: freq_250_3h | 0 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.3996 -0.5999 0.0100 0.5950 5.2293

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.548 4.189
Residual 2.727 1.651
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 12.37887 1.09977 11.256
sexM 2.18978 0.74653 2.933
age 0.06440 0.02309 2.789
ms -0.25770 0.05858 -4.399
freq_250_3h_0min_wth -0.08254 0.02564 -3.220
freq_250_3h_0min_btw -0.23023 0.24047 -0.957

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_0mn_w
sexM -0.172
age -0.810 -0.057
ms -0.313 -0.041 0.090
frq_250_3h_0mn_w -0.015 0.000 0.003 0.055
frq_250_3h_0mn_b -0.464 0.061 0.099 0.002 0.002

Robustness weights for the residuals:
3673 weights are ~= 1. The remaining 1009 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.210 0.566 0.747 0.725 0.902 0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.464 0.736 0.879 0.845 0.970 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	12.38	1.10	[10.22, 14.53]	11.26	< .001
sex [M]	2.19	0.75	[0.73, 3.65]	2.93	0.003
age	0.06	0.02	[0.02, 0.11]	2.79	0.005
ms	-0.26	0.06	[-0.37, -0.14]	-4.40	< .001
freq 250 3h 0min wth	-0.08	0.03	[-0.13, -0.03]	-3.22	0.001
freq 250 3h 0min btw	-0.23	0.24	[-0.70, 0.24]	-0.96	0.338

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.19
SD (Residual)	1.65

```
=====
OUTCOME: who5
EXPOSURE: freq_250_3h | 120 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.5383 -0.5988 0.0098 0.5895 5.5789

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.659 4.202
Residual 2.678 1.636
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.80770 0.99821 11.829
sexM 2.19020 0.75006 2.920
age 0.06698 0.02312 2.897
ms -0.25270 0.05802 -4.355
freq_250_3h_120min_wth 0.44509 0.05551 8.019
freq_250_3h_120min_btw 0.24837 0.67137 0.370

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_120mn_w
sexM -0.141
age -0.862 -0.070
ms -0.337 -0.039 0.087
frq_250_3h_120mn_w 0.008 0.001 -0.002 -0.026
frq_250_3h_120mn_b -0.212 -0.084 0.084 -0.014 0.001

Robustness weights for the residuals:
3669 weights are ~= 1. The remaining 1013 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.206 0.560 0.747 0.724 0.907 0.999

Robustness weights for the random effects:
130 weights are ~= 1. The remaining 31 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.458 0.759 0.853 0.835 0.948 0.994

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.81	1.00	[9.85, 13.76]	11.83	< .001
sex [M]	2.19	0.75	[0.72, 3.66]	2.92	0.004
age	0.07	0.02	[0.02, 0.11]	2.90	0.004
ms	-0.25	0.06	[-0.37, -0.14]	-4.36	< .001
freq 250 3h 120min wth	0.45	0.06	[0.34, 0.55]	8.02	< .001
freq 250 3h 120min btw	0.25	0.67	[-1.07, 1.56]	0.37	0.711

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.20
SD (Residual)	1.64

```
=====
OUTCOME: who5
EXPOSURE: freq_250_3h | 30 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.4661 -0.5965 0.0098 0.5850 5.2683

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.677 4.204
Residual 2.689 1.640
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.55437 1.07986 10.700
sexM 2.17751 0.75062 2.901
age 0.06445 0.02308 2.793
ms -0.26901 0.05813 -4.628
freq_250_3h_30min_wth 0.16116 0.02272 7.094
freq_250_3h_30min_btw 0.18893 0.19916 0.949

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_30mn_w
sexM -0.110
age -0.764 -0.059
ms -0.317 -0.041 0.089
frq_250_3h_30mn_w 0.007 0.000 -0.001 -0.024
frq_250_3h_30mn_b -0.427 -0.086 -0.045 0.003 0.000

Robustness weights for the residuals:
3665 weights are ~= 1. The remaining 1017 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.208 0.570 0.745 0.725 0.906 0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.459 0.781 0.888 0.856 0.981 0.998

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.55	1.08	[9.44, 13.67]	10.70	< .001
sex [M]	2.18	0.75	[0.71, 3.65]	2.90	0.004
age	0.06	0.02	[0.02, 0.11]	2.79	0.005
ms	-0.27	0.06	[-0.38, -0.16]	-4.63	< .001
freq 250 3h 30min wth	0.16	0.02	[0.12, 0.21]	7.09	< .001
freq 250 3h 30min btw	0.19	0.20	[-0.20, 0.58]	0.95	0.343

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.20
SD (Residual)	1.64

```
=====
OUTCOME: who5
EXPOSURE: freq_250_3h | 60 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.6742 -0.6002 0.0176 0.5921 5.1941

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.452 4.178
Residual 2.675 1.636
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.42521 1.02090 11.191
sexM 2.11570 0.74751 2.830
age 0.06563 0.02291 2.864
ms -0.24443 0.05795 -4.218
freq_250_3h_60min_wth 0.25632 0.02717 9.433
freq_250_3h_60min_btw 0.35762 0.24389 1.466

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_60mn_w
sexM -0.120
age -0.829 -0.065
ms -0.332 -0.040 0.089
frq_250_3h_60mn_w -0.005 -0.001 0.001 0.013
frq_250_3h_60mn_b -0.310 -0.109 0.016 -0.001 0.000

Robustness weights for the residuals:
3668 weights are ~= 1. The remaining 1014 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.202 0.564 0.749 0.728 0.916 0.999

Robustness weights for the random effects:
129 weights are ~= 1. The remaining 32 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.461 0.768 0.855 0.844 0.959 0.997

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.43	1.02	[9.42, 13.43]	11.19	< .001
sex [M]	2.12	0.75	[0.65, 3.58]	2.83	0.005
age	0.07	0.02	[0.02, 0.11]	2.86	0.004
ms	-0.24	0.06	[-0.36, -0.13]	-4.22	< .001
freq 250 3h 60min wth	0.26	0.03	[0.20, 0.31]	9.43	< .001
freq 250 3h 60min btw	0.36	0.24	[-0.12, 0.84]	1.47	0.143

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.18
SD (Residual)	1.64

```
=====
OUTCOME: who5
EXPOSURE: freq_250_3h | 90 min
=====
```

----- SUMMARY -----

Robust linear mixed model fit by DASTau
Formula: fmod_lin
Data: data2
Control: lmerControl(optimizer = "bobyqa")

Scaled residuals:
Min 1Q Median 3Q Max
-6.6164 -0.5982 0.0033 0.5899 5.2645

Random effects:
Groups Name Variance Std.Dev.
id (Intercept) 17.642 4.200
Residual 2.676 1.636
Number of obs: 4682, groups: id, 161

Fixed effects:
Estimate Std. Error t value
(Intercept) 11.65070 1.00734 11.566
sexM 2.15854 0.75011 2.878
age 0.06699 0.02307 2.904
ms -0.23541 0.05800 -4.059
freq_250_3h_90min_wth 0.28699 0.03359 8.543
freq_250_3h_90min_btw 0.23309 0.34932 0.667

Correlation of Fixed Effects:
(Intr) sexM age ms_xp_ frq_250_3h_90mn_w
sexM -0.134
age -0.852 -0.068
ms -0.335 -0.040 0.088
frq_250_3h_90mn_w -0.010 -0.001 0.003 0.027
frq_250_3h_90mn_b -0.251 -0.090 0.055 -0.008 0.001

Robustness weights for the residuals:
3674 weights are ~= 1. The remaining 1008 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.203 0.564 0.747 0.723 0.901 0.999

Robustness weights for the random effects:
128 weights are ~= 1. The remaining 33 ones are summarized as
Min. 1st Qu. Median Mean 3rd Qu. Max.
0.460 0.768 0.882 0.846 0.964 0.999

Rho functions used for fitting:
Residuals:
eff: smoothed Huber (k = 1.345, s = 10)
sig: smoothed Huber, Proposal 2 (k = 1.345, s = 10)
Random Effects, variance component 1 (id):
eff: smoothed Huber (k = 1.345, s = 10)
vcp: smoothed Huber, Proposal 2 (k = 1.345, s = 10)

----- PARAMETERS -----

Fixed Effects

Parameter	Coefficient	SE	95% CI	t(4675)	p
(Intercept)	11.65	1.01	[9.68, 13.63]	11.57	< .001
sex [M]	2.16	0.75	[0.69, 3.63]	2.88	0.004
age	0.07	0.02	[0.02, 0.11]	2.90	0.004
ms	-0.24	0.06	[-0.35, -0.12]	-4.06	< .001
freq 250 3h 90min wth	0.29	0.03	[0.22, 0.35]	8.54	< .001
freq 250 3h 90min btw	0.23	0.35	[-0.45, 0.92]	0.67	0.505

Random Effects

Parameter	Coefficient
SD (Intercept: id)	4.20
SD (Residual)	1.64