Supplement D: Testosterone Models Only (With Testosterone Outliers)

Reward sensitivity and internalizing symptoms during the transition to puberty: An examination of 9- and 10-year-olds in the ABCD Study.

Contents

Sensitivity Analysis Results for Sample 2

1—Internalizing~Puberty—

1.9 Model: CBCL internalizing factor ~ Testosterone

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      -2.1071054  2.2589226  -0.933 0.351030
## hormone_scr_ert_mean             -0.0005039  0.0064784  -0.078 0.938007
## hormone_sal_end_min_since_midnight  0.0003094  0.0007007   0.442 0.658868
## race.ethnicity.5levelBlack       -0.5533077  0.8135541  -0.680 0.496505
## race.ethnicity.5levelMixed        1.2062036  0.7946051   1.518 0.129160
## race.ethnicity.5levelOther       -0.2247794  0.9335229  -0.241 0.809743
```

```
## race.ethnicity.5levelWhite          1.1929127  0.7390607   1.614 0.106651
## interview_age                       0.0443382  0.0156553   2.832 0.004666 **
## bmi                                 0.0587276  0.0318370   1.845 0.065225 .
## household.income[>=200K]           -2.8945830  0.8606248  -3.363 0.000783 ***
## household.income[100K-200K]        -1.9876350  0.7978084  -2.491 0.012798 *
## household.income[12K-16K]          -0.6123525  1.0342241  -0.592 0.553852
## household.income[16K-25K]          -1.3834620  0.8873276  -1.559 0.119109
## household.income[25K-35K]          -0.4726691  0.8352812  -0.566 0.571533
## household.income[35K-50K]          -1.4738226  0.8131523  -1.812 0.070048 .
## household.income[50K-75K]          -1.5220404  0.7962443  -1.912 0.056067 .
## household.income[5K-12K]           -0.4096088  0.9033164  -0.453 0.650269
## household.income[75K-100K]         -1.6252271  0.8093336  -2.008 0.044754 *
## high.educBachelor                   1.1108620  0.7523008   1.477 0.139921
## high.educHS Diploma/GED             1.1386181  0.7539996   1.510 0.131160
## high.educPost Graduate Degree       1.4879881  0.7660923   1.942 0.052227 .
## high.educSome College               1.4454025  0.7016478   2.060 0.039515 *
## demo_race_hispanic1                -0.0648526  0.3621269  -0.179 0.857885
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0178
## lmer.REML =  13723  Scale est. = 17.43     n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        3.1251136  2.2407694   1.395 0.163248
## hormone_scr_ert_mean               0.0071840  0.0063349   1.134 0.256889
## hormone_sal_end_min_since_midnight 0.0010359  0.0006772   1.530 0.126241
## race.ethnicity.5levelBlack        -0.4385460  0.8970430  -0.489 0.624972
## race.ethnicity.5levelMixed         1.0414435  0.8773777   1.187 0.235348
## race.ethnicity.5levelOther         0.0948765  0.9963208   0.095 0.924143
## race.ethnicity.5levelWhite         0.9547683  0.8261128   1.156 0.247905
## interview_age                      0.0068181  0.0149042   0.457 0.647378
## bmi                                0.0401232  0.0309333   1.297 0.194727
## household.income[>=200K]          -3.2219323  0.8486686  -3.796 0.000150 ***
## household.income[100K-200K]       -2.6862181  0.7939105  -3.384 0.000727 ***
## household.income[12K-16K]         -0.2173458  1.0304497  -0.211 0.832965
## household.income[16K-25K]         -0.1232433  0.8516074  -0.145 0.884945
## household.income[25K-35K]         -0.8839737  0.8512099  -1.038 0.299147
## household.income[35K-50K]         -1.3755625  0.8074902  -1.704 0.088605 .
## household.income[50K-75K]         -1.7677057  0.7859438  -2.249 0.024594 *
```

```
## household.income[5K-12K]           -0.2018222  0.8807650  -0.229 0.818777
## household.income[75K-100K]         -2.7929951  0.8092300  -3.451 0.000567 ***
## high.educBachelor                   1.3239722  0.7943662   1.667 0.095705 .
## high.educHS Diploma/GED            -0.7125792  0.7867807  -0.906 0.365192
## high.educPost Graduate Degree       0.5625009  0.7987658   0.704 0.481369
## high.educSome College               0.9690555  0.7556597   1.282 0.199829
## demo_race_hispanic1                -0.0539936  0.3557859  -0.152 0.879390
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0311
## lmer.REML =  14919  Scale est. = 16.01     n = 2401
```

1.10 Model: CBCL Anxious-Depressed ~ Testosterone

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -0.6278787  1.2779423  -0.491   0.6232
## hormone_scr_ert_mean              -0.0005158  0.0036757  -0.140   0.8884
## hormone_sal_end_min_since_midnight  0.0003222  0.0003945   0.817   0.4141
## race.ethnicity.5levelBlack        -0.1323226  0.4574877  -0.289   0.7724
## race.ethnicity.5levelMixed         0.8271690  0.4470916   1.850   0.0644 .
## race.ethnicity.5levelOther         0.0797420  0.5256062   0.152   0.8794
## race.ethnicity.5levelWhite         0.7162109  0.4156458   1.723   0.0850 .
## interview_age                      0.0189471  0.0088860   2.132   0.0331 *
## bmi                                0.0046652  0.0179743   0.260   0.7952
## household.income[>=200K]          -1.0585835  0.4843286  -2.186   0.0289 *
## household.income[100K-200K]       -0.5389692  0.4488972  -1.201   0.2300
## household.income[12K-16K]         -0.1322651  0.5813472  -0.228   0.8200
## household.income[16K-25K]         -0.6015048  0.5001093  -1.203   0.2292
## household.income[25K-35K]         -0.0160177  0.4701268  -0.034   0.9728
## household.income[35K-50K]         -0.4137428  0.4577558  -0.904   0.3662
## household.income[50K-75K]         -0.3291524  0.4480220  -0.735   0.4626
## household.income[5K-12K]          -0.1234757  0.5096163  -0.242   0.8086
## household.income[75K-100K]        -0.3399515  0.4554739  -0.746   0.4555
## high.educBachelor                  0.2203962  0.4228538   0.521   0.6023
## high.educHS Diploma/GED            0.1548519  0.4243101   0.365   0.7152
## high.educPost Graduate Degree      0.6479895  0.4306588   1.505   0.1326
## high.educSome College              0.4808816  0.3945293   1.219   0.2230
## demo_race_hispanic1                0.0943624  0.2029479   0.465   0.6420
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0131
## lmer.REML =  11222  Scale est. = 6.7621    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       2.5457722  1.2636161   2.015  0.04405 *
## hormone_scr_ert_mean              0.0056567  0.0035700   1.585  0.11321
## hormone_sal_end_min_since_midnight 0.0002290  0.0003819   0.600  0.54886
## race.ethnicity.5levelBlack        -0.1596727  0.5042878  -0.317  0.75155
## race.ethnicity.5levelMixed         0.4909564  0.4931355   0.996  0.31956
## race.ethnicity.5levelOther         0.2528930  0.5610617   0.451  0.65222
## race.ethnicity.5levelWhite         0.6205749  0.4645337   1.336  0.18171
## interview_age                     -0.0082557  0.0084263  -0.980  0.32731
## bmi                                0.0085386  0.0174471   0.489  0.62461
## household.income[>=200K]          -1.3094295  0.4762225  -2.750  0.00601 **
## household.income[100K-200K]       -1.0350009  0.4456801  -2.322  0.02030 *
## household.income[12K-16K]          0.0462431  0.5780652   0.080  0.93625
## household.income[16K-25K]         -0.1475682  0.4782971  -0.309  0.75771
## household.income[25K-35K]         -0.3391855  0.4780272  -0.710  0.47805
## household.income[35K-50K]         -0.4316812  0.4532540  -0.952  0.34099
## household.income[50K-75K]         -0.7852210  0.4412611  -1.779  0.07529 .
## household.income[5K-12K]           0.0144265  0.4943520   0.029  0.97672
## household.income[75K-100K]        -1.0004897  0.4542089  -2.203  0.02771 *
## high.educBachelor                  1.1207750  0.4459810   2.513  0.01203 *
## high.educHS Diploma/GED           -0.0822384  0.4418826  -0.186  0.85238
## high.educPost Graduate Degree      0.7830824  0.4484060   1.746  0.08088 .
## high.educSome College              0.7409111  0.4244153   1.746  0.08099 .
## demo_race_hispanic1                0.0856255  0.1998587   0.428  0.66838
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0148
## lmer.REML =  12199  Scale est. = 6.466     n = 2401
```

1.11 Model: CBCL Withdrawn-Depressed ~ Testosterone

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       2.214e-01  6.693e-01   0.331 0.740836
## hormone_scr_ert_mean              3.278e-03  1.928e-03   1.700 0.089248 .
## hormone_sal_end_min_since_midnight -9.079e-05  2.073e-04  -0.438 0.661538
## race.ethnicity.5levelBlack        -4.174e-01  2.387e-01  -1.748 0.080548 .
## race.ethnicity.5levelMixed        -1.502e-02  2.331e-01  -0.064 0.948626
## race.ethnicity.5levelOther        -2.860e-01  2.739e-01  -1.044 0.296517
## race.ethnicity.5levelWhite        -3.848e-02  2.169e-01  -0.177 0.859221
## interview_age                      6.942e-03  4.666e-03   1.488 0.137001
## bmi                                1.687e-02  9.377e-03   1.799 0.072139 .
## household.income[>=200K]          -9.070e-01  2.519e-01  -3.601 0.000325 ***
## household.income[100K-200K]       -6.623e-01  2.333e-01  -2.838 0.004574 **
## household.income[12K-16K]         -4.354e-01  3.017e-01  -1.443 0.149052
## household.income[16K-25K]         -3.553e-01  2.606e-01  -1.363 0.172933
## household.income[25K-35K]         -1.468e-01  2.444e-01  -0.601 0.548066
## household.income[35K-50K]         -5.819e-01  2.381e-01  -2.444 0.014609 *
## household.income[50K-75K]         -5.526e-01  2.328e-01  -2.373 0.017713 *
## household.income[5K-12K]          -5.312e-02  2.657e-01  -0.200 0.841544
## household.income[75K-100K]        -5.842e-01  2.368e-01  -2.467 0.013704 *
## high.educBachelor                  1.378e-01  2.195e-01   0.628 0.530110
## high.educHS Diploma/GED            4.141e-01  2.208e-01   1.876 0.060826 .
## high.educPost Graduate Degree      1.723e-01  2.236e-01   0.770 0.441108
## high.educSome College              2.044e-01  2.049e-01   0.998 0.318489
## demo_race_hispanic1               -1.093e-02  1.058e-01  -0.103 0.917710
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0199
## lmer.REML = 8384.3  Scale est. = 2.3112    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
```

```
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       0.0926569  0.7324998   0.126 0.899351
## hormone_scr_ert_mean              0.0017790  0.0020675   0.860 0.389604
## hormone_sal_end_min_since_midnight  0.0004623  0.0002131   2.169 0.030181 *
## race.ethnicity.5levelBlack         -0.1016329  0.2926570  -0.347 0.728414
## race.ethnicity.5levelMixed          0.2786693  0.2866453   0.972 0.331062
## race.ethnicity.5levelOther          0.0375086  0.3263851   0.115 0.908517
## race.ethnicity.5levelWhite          0.1309026  0.2694849   0.486 0.627188
## interview_age                       0.0119833  0.0048943   2.448 0.014420 *
## bmi                                 0.0010222  0.0101645   0.101 0.919905
## household.income[>=200K]           -1.1097288  0.2764755  -4.014 6.16e-05 ***
## household.income[100K-200K]        -0.9543938  0.2592201  -3.682 0.000237 ***
## household.income[12K-16K]           0.0201156  0.3371281   0.060 0.952425
## household.income[16K-25K]           0.0809190  0.2787421   0.290 0.771612
## household.income[25K-35K]          -0.2926737  0.2785320  -1.051 0.293470
## household.income[35K-50K]          -0.5497860  0.2642263  -2.081 0.037565 *
## household.income[50K-75K]          -0.6839204  0.2570142  -2.661 0.007843 **
## household.income[5K-12K]           -0.0662724  0.2884396  -0.230 0.818297
## household.income[75K-100K]         -1.0067795  0.2644524  -3.807 0.000144 ***
## high.educBachelor                  -0.0111298  0.2592244  -0.043 0.965757
## high.educHS Diploma/GED            -0.5283865  0.2568631  -2.057 0.039788 *
## high.educPost Graduate Degree      -0.2676330  0.2607739  -1.026 0.304853
## high.educSome College              -0.0858814  0.2465259  -0.348 0.727596
## demo_race_hispanic1                -0.1422167  0.1116800  -1.273 0.202990
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0388
## lmer.REML = 9628.8  Scale est. = 2.1726    n = 2401
```

1.12 Model: CBCL Depressed DSM-5 ~ Testosterone

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       0.4931909  0.7796397   0.633  0.52707
## hormone_scr_ert_mean              -0.0007163  0.0022421  -0.319  0.74939
## hormone_sal_end_min_since_midnight  0.0001286  0.0002401   0.536  0.59223
```

```
## race.ethnicity.5levelBlack         -0.1501691  0.2791056  -0.538  0.59061
## race.ethnicity.5levelMixed          0.2157698  0.2728952   0.791  0.42922
## race.ethnicity.5levelOther         -0.2185505  0.3208743  -0.681  0.49587
## race.ethnicity.5levelWhite          0.2523180  0.2535797   0.995  0.31983
## interview_age                       0.0053815  0.0054204   0.993  0.32090
## bmi                                 0.0133624  0.0109749   1.218  0.22353
## household.income[>=200K]           -0.7811567  0.2957852  -2.641  0.00833 **
## household.income[100K-200K]        -0.6269009  0.2741762  -2.286  0.02232 *
## household.income[12K-16K]          -0.1102720  0.3551443  -0.310  0.75621
## household.income[16K-25K]          -0.4185991  0.3054201  -1.371  0.17065
## household.income[25K-35K]          -0.1279104  0.2871629  -0.445  0.65605
## household.income[35K-50K]          -0.3712449  0.2795677  -1.328  0.18434
## household.income[50K-75K]          -0.4935868  0.2736536  -1.804  0.07142 .
## household.income[5K-12K]            0.0499999  0.3112172   0.161  0.87238
## household.income[75K-100K]         -0.5147682  0.2781909  -1.850  0.06439 .
## high.educBachelor                  -0.1088689  0.2583097  -0.421  0.67346
## high.educHS Diploma/GED             0.0516195  0.2591501   0.199  0.84213
## high.educPost Graduate Degree       0.0742016  0.2630641   0.282  0.77792
## high.educSome College               0.0094671  0.2410133   0.039  0.96867
## demo_race_hispanic1                -0.0483067  0.1236985  -0.391  0.69619
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00797
## lmer.REML = 9048.5  Scale est. = 2.4611    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        1.0124066  0.8529977   1.187 0.235393
## hormone_scr_ert_mean               0.0032346  0.0024112   1.341 0.179896
## hormone_sal_end_min_since_midnight 0.0004119  0.0002565   1.606 0.108375
## race.ethnicity.5levelBlack         -0.1185821  0.3413029  -0.347 0.728292
## race.ethnicity.5levelMixed          0.2127619  0.3338978   0.637 0.524052
## race.ethnicity.5levelOther          0.0395954  0.3793767   0.104 0.916885
## race.ethnicity.5levelWhite          0.1802190  0.3143253   0.573 0.566461
## interview_age                       0.0051929  0.0056799   0.914 0.360676
## bmi                                -0.0012867  0.0117871  -0.109 0.913085
## household.income[>=200K]           -1.1712740  0.3227861  -3.629 0.000291 ***
## household.income[100K-200K]        -1.1497173  0.3020687  -3.806 0.000145 ***
## household.income[12K-16K]           0.1001097  0.3921622   0.255 0.798532
## household.income[16K-25K]          -0.4035714  0.3241407  -1.245 0.213236
```

```
## household.income[25K-35K]          -0.6275115  0.3239786  -1.937 0.052877 .
## household.income[35K-50K]          -0.7660946  0.3073283  -2.493 0.012743 *
## household.income[50K-75K]          -0.8100446  0.2991042  -2.708 0.006813 **
## household.income[5K-12K]           -0.2187522  0.3352520  -0.653 0.514141
## household.income[75K-100K]         -1.0077377  0.3079331  -3.273 0.001081 **
## high.educBachelor                   0.3019826  0.3022174   0.999 0.317788
## high.educHS Diploma/GED            -0.3625255  0.2993545  -1.211 0.226006
## high.educPost Graduate Degree      -0.0082493  0.3039090  -0.027 0.978347
## high.educSome College               0.3214185  0.2874836   1.118 0.263662
## demo_race_hispanic1                -0.1304978  0.1346317  -0.969 0.332497
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0257
## lmer.REML =  10330  Scale est. = 2.4462    n = 2401
```

1.13 Model: CBCL internalizing factor ~ Testosterone + PDS

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -0.8909008  2.2741589  -0.392 0.695281
## hormone_scr_ert_mean              -0.0050581  0.0065663  -0.770 0.441202
## hormone_sal_end_min_since_midnight  0.0003612  0.0006991   0.517 0.605477
## PDS_score                          0.6834329  0.1790954   3.816 0.000139 ***
## race.ethnicity.5levelBlack        -0.8587200  0.8147680  -1.054 0.292024
## race.ethnicity.5levelMixed         1.0870575  0.7924639   1.372 0.170283
## race.ethnicity.5levelOther        -0.2869147  0.9304459  -0.308 0.757836
## race.ethnicity.5levelWhite         1.1260331  0.7367968   1.528 0.126586
## interview_age                      0.0287436  0.0161343   1.782 0.074965 .
## bmi                                0.0387861  0.0321549   1.206 0.227860
## household.income[>=200K]          -2.7137092  0.8587692  -3.160 0.001599 **
## household.income[100K-200K]       -1.8334576  0.7959079  -2.304 0.021338 *
## household.income[12K-16K]         -0.3893694  1.0320168  -0.377 0.705995
## household.income[16K-25K]         -1.2850728  0.8845393  -1.453 0.146418
## household.income[25K-35K]         -0.3468624  0.8328671  -0.416 0.677108
## household.income[35K-50K]         -1.3619024  0.8107506  -1.680 0.093137 .
## household.income[50K-75K]         -1.4314341  0.7936936  -1.804 0.071445 .
## household.income[5K-12K]          -0.3464536  0.9003389  -0.385 0.700420
## household.income[75K-100K]        -1.4668235  0.8074577  -1.817 0.069415 .
## high.educBachelor                  1.0998676  0.7495061   1.467 0.142395
## high.educHS Diploma/GED            1.0663359  0.7514866   1.419 0.156050
```

```
## high.educPost Graduate Degree       1.4639553  0.7632768   1.918 0.055242 .
## high.educSome College               1.3299620  0.6996736   1.901 0.057455 .
## demo_race_hispanic1                -0.0233628  0.3611620  -0.065 0.948428
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0232
## lmer.REML =  13710  Scale est. = 17.6      n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        3.1094686  2.2381031   1.389 0.164862
## hormone_scr_ert_mean               0.0056273  0.0063564   0.885 0.376087
## hormone_sal_end_min_since_midnight 0.0010658  0.0006764   1.576 0.115235
## PDS_score                          0.5659186  0.2204845   2.567 0.010328 *
## race.ethnicity.5levelBlack        -0.6283565  0.8991212  -0.699 0.484710
## race.ethnicity.5levelMixed         1.0418330  0.8764143   1.189 0.234659
## race.ethnicity.5levelOther         0.1184794  0.9952332   0.119 0.905248
## race.ethnicity.5levelWhite         0.9583017  0.8251911   1.161 0.245633
## interview_age                      0.0018883  0.0150114   0.126 0.899905
## bmi                                0.0293862  0.0311773   0.943 0.346007
## household.income[>=200K]          -3.0231095  0.8513161  -3.551 0.000391 ***
## household.income[100K-200K]       -2.4920591  0.7966839  -3.128 0.001781 **
## household.income[12K-16K]         -0.1171280  1.0301292  -0.114 0.909483
## household.income[16K-25K]          0.0539556  0.8535178   0.063 0.949600
## household.income[25K-35K]         -0.6819396  0.8539438  -0.799 0.424616
## household.income[35K-50K]         -1.1892696  0.8099251  -1.468 0.142136
## household.income[50K-75K]         -1.6184335  0.7872785  -2.056 0.039917 *
## household.income[5K-12K]          -0.1620701  0.8799829  -0.184 0.853893
## household.income[75K-100K]        -2.6055834  0.8116740  -3.210 0.001344 **
## high.educBachelor                  1.2468369  0.7940826   1.570 0.116511
## high.educHS Diploma/GED           -0.7967635  0.7866197  -1.013 0.311213
## high.educPost Graduate Degree      0.4918692  0.7983868   0.616 0.537902
## high.educSome College              0.8666339  0.7559016   1.146 0.251708
## demo_race_hispanic1               -0.0716410  0.3553992  -0.202 0.840263
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0331
## lmer.REML =  14914  Scale est. = 15.895    n = 2401
```

1.14 Model: CBCL internalizing factor ~ Testosterone + Pubertal category

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -0.4014828  2.3537691  -0.171  0.86458
## hormone_scr_ert_mean              -0.0030647  0.0065386  -0.469  0.63933
## hormone_sal_end_min_since_midnight  0.0002946  0.0007016   0.420  0.67461
## pds_p_ss_categoryEarly             0.3009121  0.3143608   0.957  0.33856
## pds_p_ss_categoryLate              0.7784655  0.8009235   0.972  0.33118
## pds_p_ss_categoryMid               0.8306195  0.3086501   2.691  0.00717 **
## race.ethnicity.5levelBlack        -0.7379536  0.8151487  -0.905  0.36541
## race.ethnicity.5levelMixed         1.1287245  0.7938496   1.422  0.15522
## race.ethnicity.5levelOther        -0.2419654  0.9319611  -0.260  0.79517
## race.ethnicity.5levelWhite         1.1504108  0.7380217   1.559  0.11919
## interview_age                      0.0311708  0.0165036   1.889  0.05906 .
## bmi                                0.0329450  0.0333538   0.988  0.32339
## household.income[>=200K]          -2.7433347  0.8612128  -3.185  0.00147 **
## household.income[100K-200K]       -1.8535785  0.7983608  -2.322  0.02034 *
## household.income[12K-16K]         -0.5653939  1.0329704  -0.547  0.58420
## household.income[16K-25K]         -1.2856346  0.8866460  -1.450  0.14720
## household.income[25K-35K]         -0.4273756  0.8348164  -0.512  0.60874
## household.income[35K-50K]         -1.4270826  0.8120506  -1.757  0.07899 .
## household.income[50K-75K]         -1.4592006  0.7955690  -1.834  0.06677 .
## household.income[5K-12K]          -0.3556083  0.9029050  -0.394  0.69373
## household.income[75K-100K]        -1.5140074  0.8092192  -1.871  0.06149 .
## high.educBachelor                  1.0810420  0.7515602   1.438  0.15046
## high.educHS Diploma/GED            1.0945076  0.7528005   1.454  0.14611
## high.educPost Graduate Degree      1.4494531  0.7655446   1.893  0.05844 .
## high.educSome College              1.3856339  0.7013563   1.976  0.04832 *
## demo_race_hispanic1               -0.0709145  0.3617479  -0.196  0.84460
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0199
## lmer.REML =  13716  Scale est. = 17.856    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
```

```
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        3.387009   2.244366   1.509 0.131402
## hormone_scr_ert_mean               0.006563   0.006355   1.033 0.301800
## hormone_sal_end_min_since_midnight 0.001041   0.000677   1.537 0.124397
## pds_p_ss_categoryEarly             0.441032   0.278907   1.581 0.113946
## pds_p_ss_categoryLate             -0.315016   1.685268  -0.187 0.851736
## pds_p_ss_categoryMid               1.098417   0.526720   2.085 0.037141 *
## race.ethnicity.5levelBlack        -0.540484   0.898760  -0.601 0.547653
## race.ethnicity.5levelMixed         1.102142   0.877518   1.256 0.209248
## race.ethnicity.5levelOther         0.163845   0.996229   0.164 0.869379
## race.ethnicity.5levelWhite         1.043538   0.826533   1.263 0.206875
## interview_age                      0.003954   0.014974   0.264 0.791761
## bmi                                0.032382   0.031105   1.041 0.297955
## household.income[>=200K]          -3.092505   0.853191  -3.625 0.000295 ***
## household.income[100K-200K]       -2.557571   0.798642  -3.202 0.001381 **
## household.income[12K-16K]         -0.200737   1.033101  -0.194 0.845954
## household.income[16K-25K]         -0.016447   0.855949  -0.019 0.984671
## household.income[25K-35K]         -0.745454   0.858711  -0.868 0.385423
## household.income[35K-50K]         -1.259720   0.811840  -1.552 0.120871
## household.income[50K-75K]         -1.666951   0.789014  -2.113 0.034731 *
## household.income[5K-12K]          -0.203182   0.881407  -0.231 0.817707
## household.income[75K-100K]        -2.682790   0.813260  -3.299 0.000985 ***
## high.educBachelor                  1.249446   0.795208   1.571 0.116265
## high.educHS Diploma/GED           -0.821759   0.788289  -1.042 0.297305
## high.educPost Graduate Degree      0.496046   0.799500   0.620 0.535024
## high.educSome College              0.849337   0.757430   1.121 0.262256
## demo_race_hispanic1               -0.091634   0.356093  -0.257 0.796946
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.032
## lmer.REML =  14911  Scale est. = 15.895    n = 2401
```

1.15 Model: CBCL Anxious-Depressed ~ Testosterone + PDS

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
```

```
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -0.0920232  1.2882575  -0.071  0.94306
## hormone_scr_ert_mean              -0.0025561  0.0037315  -0.685  0.49342
## hormone_sal_end_min_since_midnight  0.0003435  0.0003942   0.871  0.38372
## PDS_score                          0.3017431  0.1013996   2.976  0.00295 **
## race.ethnicity.5levelBlack        -0.2652441  0.4588441  -0.578  0.56328
## race.ethnicity.5levelMixed         0.7753733  0.4465176   1.736  0.08262 .
## race.ethnicity.5levelOther         0.0538544  0.5245876   0.103  0.91824
## race.ethnicity.5levelWhite         0.6869058  0.4149906   1.655  0.09802 .
## interview_age                      0.0121067  0.0091654   1.321  0.18667
## bmi                               -0.0042453  0.0181822  -0.233  0.81540
## household.income[>=200K]          -0.9786515  0.4839268  -2.022  0.04326 *
## household.income[100K-200K]       -0.4711869  0.4484121  -1.051  0.29347
## household.income[12K-16K]         -0.0340576  0.5808720  -0.059  0.95325
## household.income[16K-25K]         -0.5595962  0.4991948  -1.121  0.26241
## household.income[25K-35K]          0.0384669  0.4693705   0.082  0.93469
## household.income[35K-50K]         -0.3649910  0.4570041  -0.799  0.42457
## household.income[50K-75K]         -0.2898722  0.4471731  -0.648  0.51690
## household.income[5K-12K]          -0.0973030  0.5085805  -0.191  0.84829
## household.income[75K-100K]        -0.2704652  0.4550171  -0.594  0.55230
## high.educBachelor                  0.2160937  0.4218528   0.512  0.60853
## high.educHS Diploma/GED            0.1240475  0.4234712   0.293  0.76960
## high.educPost Graduate Degree      0.6373348  0.4296596   1.483  0.13813
## high.educSome College              0.4301231  0.3939573   1.092  0.27504
## demo_race_hispanic1                0.1121954  0.2027286   0.553  0.58003
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0159
## lmer.REML =  11216  Scale est. = 6.8238    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       2.5367031  1.2623736   2.009   0.0446 *
## hormone_scr_ert_mean              0.0048465  0.0035823   1.353   0.1762
## hormone_sal_end_min_since_midnight  0.0002458  0.0003816   0.644   0.5195
## PDS_score                         0.2992499  0.1244681   2.404   0.0163 *
## race.ethnicity.5levelBlack        -0.2594062  0.5055190  -0.513   0.6079
## race.ethnicity.5levelMixed         0.4918374  0.4926711   0.998   0.3182
```

```
## race.ethnicity.5levelOther          0.2656771  0.5605448   0.474   0.6356
## race.ethnicity.5levelWhite          0.6227686  0.4640931   1.342   0.1798
## interview_age                      -0.0108717  0.0084887  -1.281   0.2004
## bmi                                 0.0028566  0.0175897   0.162   0.8710
## household.income[>=200K]           -1.2034724  0.4778171  -2.519   0.0118 *
## household.income[100K-200K]        -0.9313861  0.4473457  -2.082   0.0374 *
## household.income[12K-16K]           0.1004819  0.5779766   0.174   0.8620
## household.income[16K-25K]          -0.0541474  0.4794317  -0.113   0.9101
## household.income[25K-35K]          -0.2318943  0.4796568  -0.483   0.6288
## household.income[35K-50K]          -0.3337547  0.4546686  -0.734   0.4630
## household.income[50K-75K]          -0.7057442  0.4420896  -1.596   0.1105
## household.income[5K-12K]            0.0360286  0.4939761   0.073   0.9419
## household.income[75K-100K]         -0.9010217  0.4556659  -1.977   0.0481 *
## high.educBachelor                   1.0797617  0.4458884   2.422   0.0155 *
## high.educHS Diploma/GED            -0.1268883  0.4418572  -0.287   0.7740
## high.educPost Graduate Degree       0.7454205  0.4482610   1.663   0.0965 .
## high.educSome College               0.6863575  0.4246224   1.616   0.1061
## demo_race_hispanic1                 0.0768225  0.1996986   0.385   0.7005
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0166
## lmer.REML =  12196  Scale est. = 6.4317    n = 2401
```

1.16 Model: CBCL Anxious-Depressed ~ Testosterone + Pubertal category

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.1354643  1.3319127   0.102   0.9190
## hormone_scr_ert_mean              -0.0016070  0.0037122  -0.433   0.6651
## hormone_sal_end_min_since_midnight  0.0002989  0.0003953   0.756   0.4496
## pds_p_ss_categoryEarly              0.2349230  0.1784307   1.317   0.1881
## pds_p_ss_categoryLate               0.2566102  0.4540128   0.565   0.5720
## pds_p_ss_categoryMid                0.3940787  0.1748688   2.254   0.0243 *
## race.ethnicity.5levelBlack         -0.2071872  0.4587886  -0.452   0.6516
## race.ethnicity.5levelMixed          0.7922716  0.4470233   1.772   0.0765 .
## race.ethnicity.5levelOther          0.0714176  0.5251161   0.136   0.8918
## race.ethnicity.5levelWhite          0.6972459  0.4154149   1.678   0.0934 .
## interview_age                       0.0129311  0.0093639   1.381   0.1674
## bmi                                -0.0072197  0.0188507  -0.383   0.7018
## household.income[>=200K]           -0.9943174  0.4849936  -2.050   0.0405 *
```

```
## household.income[100K-200K]        -0.4823280  0.4495150  -1.073   0.2834
## household.income[12K-16K]          -0.1209538  0.5810498  -0.208   0.8351
## household.income[16K-25K]          -0.5517352  0.5000714  -1.103   0.2700
## household.income[25K-35K]           0.0014186  0.4701874   0.003   0.9976
## household.income[35K-50K]          -0.3910107  0.4574483  -0.855   0.3928
## household.income[50K-75K]          -0.3027098  0.4479492  -0.676   0.4993
## household.income[5K-12K]           -0.0951313  0.5096709  -0.187   0.8520
## household.income[75K-100K]         -0.2905233  0.4557245  -0.637   0.5239
## high.educBachelor                   0.2091117  0.4227829   0.495   0.6209
## high.educHS Diploma/GED             0.1395986  0.4239649   0.329   0.7420
## high.educPost Graduate Degree       0.6318352  0.4307089   1.467   0.1425
## high.educSome College               0.4578850  0.3946842   1.160   0.2461
## demo_race_hispanic1                 0.0910777  0.2029286   0.449   0.6536
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0138
## lmer.REML =  11220  Scale est. = 6.8753    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        2.6717632  1.2657163   2.111   0.0349 *
## hormone_scr_ert_mean               0.0053064  0.0035814   1.482   0.1386
## hormone_sal_end_min_since_midnight 0.0002331  0.0003819   0.610   0.5417
## pds_p_ss_categoryEarly             0.2088536  0.1574108   1.327   0.1847
## pds_p_ss_categoryLate             -0.0422533  0.9476169  -0.045   0.9644
## pds_p_ss_categoryMid               0.6498566  0.2972309   2.186   0.0289 *
## race.ethnicity.5levelBlack        -0.2183104  0.5052755  -0.432   0.6657
## race.ethnicity.5levelMixed         0.5279389  0.4932414   1.070   0.2846
## race.ethnicity.5levelOther         0.2911171  0.5610462   0.519   0.6039
## race.ethnicity.5levelWhite         0.6701363  0.4648046   1.442   0.1495
## interview_age                     -0.0097797  0.0084667  -1.155   0.2482
## bmi                                0.0044742  0.0175463   0.255   0.7987
## household.income[>=200K]          -1.2293690  0.4787945  -2.568   0.0103 *
## household.income[100K-200K]       -0.9560114  0.4483667  -2.132   0.0331 *
## household.income[12K-16K]          0.0630462  0.5795551   0.109   0.9134
## household.income[16K-25K]         -0.0775666  0.4807415  -0.161   0.8718
## household.income[25K-35K]         -0.2478896  0.4822305  -0.514   0.6073
## household.income[35K-50K]         -0.3598690  0.4556773  -0.790   0.4298
## household.income[50K-75K]         -0.7221314  0.4429986  -1.630   0.1032
## household.income[5K-12K]           0.0195119  0.4947129   0.039   0.9685
```

```
## household.income[75K-100K]         -0.9312538  0.4564889  -2.040   0.0415 *
## high.educBachelor                    1.0832776  0.4464645   2.426   0.0153 *
## high.educHS Diploma/GED             -0.1420490  0.4427410  -0.321   0.7484
## high.educPost Graduate Degree        0.7504066  0.4488259   1.672   0.0947 .
## high.educSome College                0.6775729  0.4254231   1.593   0.1114
## demo_race_hispanic1                  0.0639036  0.2000738   0.319   0.7495
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0156
## lmer.REML =  12194  Scale est. = 6.4311    n = 2401
```

1.17 Model: CBCL Withdrawn-Depressed ~ Testosterone + PDS

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         5.155e-01  6.745e-01   0.764 0.444769
## hormone_scr_ert_mean                2.170e-03  1.957e-03   1.109 0.267577
## hormone_sal_end_min_since_midnight -7.674e-05  2.069e-04  -0.371 0.710767
## PDS_score                           1.644e-01  5.301e-02   3.101 0.001953 **
## race.ethnicity.5levelBlack         -4.887e-01  2.393e-01  -2.042 0.041231 *
## race.ethnicity.5levelMixed         -4.181e-02  2.327e-01  -0.180 0.857427
## race.ethnicity.5levelOther         -2.988e-01  2.733e-01  -1.094 0.274292
## race.ethnicity.5levelWhite         -5.372e-02  2.165e-01  -0.248 0.804044
## interview_age                       3.192e-03  4.811e-03   0.664 0.507054
## bmi                                 1.196e-02  9.489e-03   1.261 0.207504
## household.income[>=200K]           -8.650e-01  2.517e-01  -3.437 0.000599 ***
## household.income[100K-200K]        -6.265e-01  2.330e-01  -2.688 0.007239 **
## household.income[12K-16K]          -3.812e-01  3.014e-01  -1.265 0.206144
## household.income[16K-25K]          -3.330e-01  2.601e-01  -1.280 0.200725
## household.income[25K-35K]          -1.181e-01  2.440e-01  -0.484 0.628324
## household.income[35K-50K]          -5.560e-01  2.377e-01  -2.339 0.019427 *
## household.income[50K-75K]          -5.313e-01  2.324e-01  -2.286 0.022326 *
## household.income[5K-12K]           -3.861e-02  2.651e-01  -0.146 0.884210
## household.income[75K-100K]         -5.467e-01  2.365e-01  -2.311 0.020924 *
## high.educBachelor                   1.351e-01  2.190e-01   0.617 0.537217
## high.educHS Diploma/GED             3.972e-01  2.203e-01   1.803 0.071529 .
## high.educPost Graduate Degree       1.661e-01  2.231e-01   0.745 0.456593
## high.educSome College               1.764e-01  2.046e-01   0.862 0.388789
## demo_race_hispanic1                -2.211e-04  1.056e-01  -0.002 0.998329
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0237
## lmer.REML = 8378.8  Scale est. = 2.323     n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       0.0850444  0.7322648   0.116 0.907552
## hormone_scr_ert_mean              0.0014372  0.0020763   0.692 0.488886
## hormone_sal_end_min_since_midnight  0.0004688  0.0002132   2.199 0.027968 *
## PDS_score                         0.1264913  0.0725973   1.742 0.081573 .
## race.ethnicity.5levelBlack        -0.1444516  0.2935956  -0.492 0.622759
## race.ethnicity.5levelMixed         0.2787381  0.2865710   0.973 0.330818
## race.ethnicity.5levelOther         0.0437563  0.3262988   0.134 0.893336
## race.ethnicity.5levelWhite         0.1319749  0.2694172   0.490 0.624283
## interview_age                      0.0109155  0.0049323   2.213 0.026987 *
## bmi                               -0.0013839  0.0102543  -0.135 0.892653
## household.income[>=200K]          -1.0646179  0.2775900  -3.835 0.000129 ***
## household.income[100K-200K]       -0.9101038  0.2603612  -3.496 0.000482 ***
## household.income[12K-16K]          0.0431800  0.3373034   0.128 0.898148
## household.income[16K-25K]          0.1207606  0.2796014   0.432 0.665851
## household.income[25K-35K]         -0.2468875  0.2796689  -0.883 0.377442
## household.income[35K-50K]         -0.5077655  0.2652332  -1.914 0.055688 .
## household.income[50K-75K]         -0.6498225  0.2576798  -2.522 0.011740 *
## household.income[5K-12K]          -0.0569439  0.2884122  -0.197 0.843501
## household.income[75K-100K]        -0.9640526  0.2654888  -3.631 0.000288 ***
## high.educBachelor                 -0.0287394  0.2593460  -0.111 0.911772
## high.educHS Diploma/GED           -0.5470612  0.2570123  -2.129 0.033395 *
## high.educPost Graduate Degree     -0.2841172  0.2608714  -1.089 0.276216
## high.educSome College             -0.1089682  0.2468055  -0.442 0.658881
## demo_race_hispanic1               -0.1475667  0.1117358  -1.321 0.186737
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0393
## lmer.REML = 9629.2  Scale est. = 2.1545    n = 2401
```

1.18 Model: CBCL Withdrawn-Depressed ~ Testosterone + Pubertal category

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         6.255e-01  6.974e-01   0.897  0.36986
## hormone_scr_ert_mean                2.666e-03  1.947e-03   1.369  0.17114
## hormone_sal_end_min_since_midnight -7.981e-05  2.075e-04  -0.385  0.70055
## pds_p_ss_categoryEarly              1.123e-02  9.353e-02   0.120  0.90447
## pds_p_ss_categoryLate               3.436e-01  2.374e-01   1.447  0.14803
## pds_p_ss_categoryMid                1.676e-01  9.148e-02   1.832  0.06714 .
## race.ethnicity.5levelBlack         -4.604e-01  2.394e-01  -1.923  0.05456 .
## race.ethnicity.5levelMixed         -2.748e-02  2.330e-01  -0.118  0.90615
## race.ethnicity.5levelOther         -2.867e-01  2.737e-01  -1.048  0.29482
## race.ethnicity.5levelWhite         -4.482e-02  2.168e-01  -0.207  0.83621
## interview_age                       3.886e-03  4.914e-03   0.791  0.42918
## bmi                                 1.089e-02  9.843e-03   1.107  0.26854
## household.income[>=200K]           -8.783e-01  2.523e-01  -3.481  0.00051 ***
## household.income[100K-200K]        -6.355e-01  2.337e-01  -2.719  0.00660 **
## household.income[12K-16K]          -4.221e-01  3.016e-01  -1.399  0.16181
## household.income[16K-25K]          -3.415e-01  2.607e-01  -1.310  0.19041
## household.income[25K-35K]          -1.430e-01  2.445e-01  -0.585  0.55872
## household.income[35K-50K]          -5.768e-01  2.380e-01  -2.423  0.01547 *
## household.income[50K-75K]          -5.434e-01  2.329e-01  -2.334  0.01970 *
## household.income[5K-12K]           -5.087e-02  2.658e-01  -0.191  0.84822
## household.income[75K-100K]         -5.641e-01  2.370e-01  -2.380  0.01739 *
## high.educBachelor                   1.358e-01  2.196e-01   0.618  0.53643
## high.educHS Diploma/GED             4.042e-01  2.207e-01   1.832  0.06713 .
## high.educPost Graduate Degree       1.696e-01  2.238e-01   0.758  0.44857
## high.educSome College               1.941e-01  2.051e-01   0.947  0.34389
## demo_race_hispanic1                -1.299e-02  1.057e-01  -0.123  0.90217
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0212
## lmer.REML = 8386.4  Scale est. = 2.3236    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
```

```
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       0.1479484  0.7336440   0.202 0.840198
## hormone_scr_ert_mean              0.0018109  0.0020741   0.873 0.382702
## hormone_sal_end_min_since_midnight 0.0004624  0.0002130   2.171 0.030062 *
## pds_p_ss_categoryEarly            0.0707316  0.0916320   0.772 0.440244
## pds_p_ss_categoryLate            -0.7469836  0.5521087  -1.353 0.176196
## pds_p_ss_categoryMid              0.3219294  0.1734268   1.856 0.063537 .
## race.ethnicity.5levelBlack       -0.1128821  0.2931857  -0.385 0.700258
## race.ethnicity.5levelMixed        0.2985684  0.2866767   1.041 0.297758
## race.ethnicity.5levelOther        0.0615738  0.3263555   0.189 0.850367
## race.ethnicity.5levelWhite        0.1568252  0.2696217   0.582 0.560858
## interview_age                     0.0116081  0.0049166   2.361 0.018306 *
## bmi                              -0.0006944  0.0102227  -0.068 0.945851
## household.income[>=200K]         -1.0990287  0.2779280  -3.954  7.9e-05 ***
## household.income[100K-200K]      -0.9440092  0.2607736  -3.620 0.000301 ***
## household.income[12K-16K]        -0.0060633  0.3379911  -0.018 0.985689
## household.income[16K-25K]         0.0912763  0.2801501   0.326 0.744595
## household.income[25K-35K]        -0.2759479  0.2809943  -0.982 0.326180
## household.income[35K-50K]        -0.5405498  0.2656193  -2.035 0.041956 *
## household.income[50K-75K]        -0.6748480  0.2580239  -2.615 0.008967 **
## household.income[5K-12K]         -0.0802683  0.2886214  -0.278 0.780953
## household.income[75K-100K]       -0.9996615  0.2657856  -3.761 0.000173 ***
## high.educBachelor                -0.0447294  0.2595381  -0.172 0.863183
## high.educHS Diploma/GED          -0.5733390  0.2573771  -2.228 0.025999 *
## high.educPost Graduate Degree    -0.2986340  0.2610434  -1.144 0.252738
## high.educSome College            -0.1319221  0.2471427  -0.534 0.593537
## demo_race_hispanic1              -0.1550843  0.1117978  -1.387 0.165515
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =   0.04
## lmer.REML = 9626.8  Scale est. = 2.1639    n = 2401
```

1.19 Model: CBCL Depressed DSM-5 ~ Testosterone + PDS

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
```

```
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       0.6946964  0.7869030   0.883   0.3774
## hormone_scr_ert_mean             -0.0014794  0.0022787  -0.649   0.5163
## hormone_sal_end_min_since_midnight  0.0001378  0.0002400   0.574   0.5659
## PDS_score                         0.1142379  0.0619875   1.843   0.0655 .
## race.ethnicity.5levelBlack       -0.2010053  0.2803340  -0.717   0.4734
## race.ethnicity.5levelMixed        0.1962901  0.2729607   0.719   0.4721
## race.ethnicity.5levelOther       -0.2286675  0.3207540  -0.713   0.4760
## race.ethnicity.5levelWhite        0.2412467  0.2535298   0.952   0.3414
## interview_age                     0.0027944  0.0055972   0.499   0.6177
## bmi                               0.0100094  0.0111187   0.900   0.3681
## household.income[>=200K]         -0.7517559  0.2960444  -2.539   0.0112 *
## household.income[100K-200K]      -0.6016709  0.2743596  -2.193   0.0284 *
## household.income[12K-16K]        -0.0738405  0.3555015  -0.208   0.8355
## household.income[16K-25K]        -0.4031889  0.3053641  -1.320   0.1869
## household.income[25K-35K]        -0.1079837  0.2872057  -0.376   0.7070
## household.income[35K-50K]        -0.3531059  0.2795852  -1.263   0.2067
## household.income[50K-75K]        -0.4789237  0.2736161  -1.750   0.0802 .
## household.income[5K-12K]          0.0596199  0.3110866   0.192   0.8480
## household.income[75K-100K]       -0.4886210  0.2783955  -1.755   0.0794 .
## high.educBachelor                -0.1105536  0.2581676  -0.428   0.6685
## high.educHS Diploma/GED           0.0399195  0.2590819   0.154   0.8776
## high.educPost Graduate Degree     0.0702587  0.2629264   0.267   0.7893
## high.educSome College            -0.0097467  0.2411010  -0.040   0.9678
## demo_race_hispanic1              -0.0413247  0.1237114  -0.334   0.7384
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00877
## lmer.REML = 9048.8  Scale est. = 2.4586    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       1.0077260  0.8527953   1.182 0.237453
## hormone_scr_ert_mean              0.0029130  0.0024217   1.203 0.229140
## hormone_sal_end_min_since_midnight  0.0004190  0.0002563   1.634 0.102310
## PDS_score                         0.1179989  0.0841137   1.403 0.160792
## race.ethnicity.5levelBlack       -0.1577587  0.3424278  -0.461 0.645051
## race.ethnicity.5levelMixed        0.2129960  0.3338592   0.638 0.523547
```

```
## race.ethnicity.5levelOther          0.0445000  0.3793344   0.117 0.906624
## race.ethnicity.5levelWhite          0.1810756  0.3142793   0.576 0.564561
## interview_age                       0.0041733  0.0057260   0.729 0.466172
## bmi                                -0.0035285  0.0118920  -0.297 0.766713
## household.income[>=200K]           -1.1299681  0.3241164  -3.486 0.000499 ***
## household.income[100K-200K]        -1.1094067  0.3034305  -3.656 0.000262 ***
## household.income[12K-16K]           0.1206043  0.3924391   0.307 0.758627
## household.income[16K-25K]          -0.3668188  0.3251955  -1.128 0.259436
## household.income[25K-35K]          -0.5854314  0.3253495  -1.799 0.072083 .
## household.income[35K-50K]          -0.7276360  0.3085655  -2.358 0.018448 *
## household.income[50K-75K]          -0.7791384  0.2999164  -2.598 0.009439 **
## household.income[5K-12K]           -0.2105793  0.3352934  -0.628 0.530035
## household.income[75K-100K]         -0.9688332  0.3091766  -3.134 0.001748 **
## high.educBachelor                   0.2857916  0.3024080   0.945 0.344728
## high.educHS Diploma/GED            -0.3800537  0.2995869  -1.269 0.204711
## high.educPost Graduate Degree      -0.0231285  0.3040671  -0.076 0.939375
## high.educSome College               0.3001107  0.2878577   1.043 0.297255
## demo_race_hispanic1                -0.1344105  0.1345910  -0.999 0.318062
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.026
## lmer.REML =  10331  Scale est. = 2.4301    n = 2401
```

1.20 Model: CBCL Depressed DSM-5 ~ Testosterone + Pubertal category

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.8037768  0.8131014   0.989   0.3230
## hormone_scr_ert_mean              -0.0012351  0.0022655  -0.545   0.5857
## hormone_sal_end_min_since_midnight  0.0001333  0.0002406   0.554   0.5798
## pds_p_ss_categoryEarly              0.0117692  0.1089577   0.108   0.9140
## pds_p_ss_categoryLate               0.1408096  0.2773070   0.508   0.6117
## pds_p_ss_categoryMid                0.1546003  0.1068124   1.447   0.1479
## race.ethnicity.5levelBlack         -0.1893051  0.2801163  -0.676   0.4992
## race.ethnicity.5levelMixed          0.2004811  0.2730743   0.734   0.4629
## race.ethnicity.5levelOther         -0.2206535  0.3208408  -0.688   0.4917
## race.ethnicity.5levelWhite          0.2441351  0.2536279   0.963   0.3359
## interview_age                       0.0030328  0.0057152   0.531   0.5957
## bmi                                 0.0086767  0.0115185   0.753   0.4514
## household.income[>=200K]           -0.7481744  0.2964616  -2.524   0.0117 *
```

```
## household.income[100K-200K]        -0.5967619  0.2748119  -2.172   0.0300 *
## household.income[12K-16K]          -0.0959433  0.3553197  -0.270   0.7872
## household.income[16K-25K]          -0.4019625  0.3056582  -1.315   0.1886
## household.income[25K-35K]          -0.1161077  0.2874691  -0.404   0.6863
## household.income[35K-50K]          -0.3617134  0.2796349  -1.294   0.1960
## household.income[50K-75K]          -0.4788741  0.2738693  -1.749   0.0805 .
## household.income[5K-12K]            0.0602827  0.3115127   0.194   0.8466
## household.income[75K-100K]         -0.4907891  0.2786041  -1.762   0.0783 .
## high.educBachelor                  -0.1180154  0.2585200  -0.457   0.6481
## high.educHS Diploma/GED             0.0408853  0.2591745   0.158   0.8747
## high.educPost Graduate Degree       0.0632737  0.2633491   0.240   0.8101
## high.educSome College              -0.0061747  0.2413435  -0.026   0.9796
## demo_race_hispanic1                -0.0481683  0.1237784  -0.389   0.6972
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0077
## lmer.REML = 9052.2  Scale est. = 2.4823    n = 2223
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        1.1122773  0.8547680   1.301 0.193295
## hormone_scr_ert_mean               0.0030234  0.0024200   1.249 0.211670
## hormone_sal_end_min_since_midnight 0.0004134  0.0002564   1.612 0.106989
## pds_p_ss_categoryEarly             0.1896553  0.1063360   1.784 0.074625 .
## pds_p_ss_categoryLate              0.0053956  0.6419696   0.008 0.993295
## pds_p_ss_categoryMid               0.1538028  0.2008690   0.766 0.443939
## race.ethnicity.5levelBlack        -0.1454050  0.3421418  -0.425 0.670886
## race.ethnicity.5levelMixed         0.2191064  0.3341467   0.656 0.512068
## race.ethnicity.5levelOther         0.0527796  0.3795576   0.139 0.889418
## race.ethnicity.5levelWhite         0.1978742  0.3146587   0.629 0.529506
## interview_age                      0.0042494  0.0057092   0.744 0.456766
## bmi                               -0.0036310  0.0118593  -0.306 0.759502
## household.income[>=200K]          -1.1452476  0.3247001  -3.527 0.000428 ***
## household.income[100K-200K]       -1.1226601  0.3040628  -3.692 0.000227 ***
## household.income[12K-16K]          0.1055398  0.3934381   0.268 0.788530
## household.income[16K-25K]         -0.3914221  0.3260023  -1.201 0.229998
## household.income[25K-35K]         -0.6157337  0.3270477  -1.883 0.059863 .
## household.income[35K-50K]         -0.7456437  0.3091839  -2.412 0.015956 *
## household.income[50K-75K]         -0.7922665  0.3004689  -2.637 0.008425 **
## household.income[5K-12K]          -0.2222477  0.3357191  -0.662 0.508032
```

```
## household.income[75K-100K]         -0.9870268  0.3096700  -3.187 0.001454 **
## high.educBachelor                   0.2831197  0.3027320   0.935 0.349772
## high.educHS Diploma/GED            -0.3812996  0.3001166  -1.271 0.204029
## high.educPost Graduate Degree      -0.0258133  0.3043847  -0.085 0.932424
## high.educSome College               0.2947286  0.2883378   1.022 0.306807
## demo_race_hispanic1                -0.1360715  0.1347525  -1.010 0.312700
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0256
## lmer.REML =  10330  Scale est. = 2.4215    n = 2401
```

2—Reward~Puberty—

2.11 Model: Caudate Anticipation ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -2.409e-01  3.539e-01  -0.681    0.496
## hormone_scr_ert_mean               -1.337e-03  1.134e-03  -1.180    0.238
## hormone_sal_end_min_since_midnight -1.533e-04  1.236e-04  -1.240    0.215
## interview_age                       4.223e-03  2.808e-03   1.504    0.133
## MRI_minus_hormone_date_time         1.185e-06  2.634e-06   0.450    0.653
## bmi                                -5.439e-03  5.499e-03  -0.989    0.323
##
##
## R-sq.(adj) =  0.000848
## lmer.REML = 4962.6  Scale est. = 0.7222    n = 1883
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
```

```
##
## Formula:
## caudate_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -1.960e-01  3.537e-01  -0.554   0.5796
## hormone_scr_ert_mean               -1.369e-03  1.231e-03  -1.113   0.2659
## hormone_sal_end_min_since_midnight  1.367e-04  1.251e-04   1.093   0.2747
## interview_age                       2.756e-03  2.782e-03   0.991   0.3220
## MRI_minus_hormone_date_time         3.169e-07  2.885e-06   0.110   0.9125
## bmi                                -1.054e-02  5.678e-03  -1.856   0.0636 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00143
## lmer.REML = 5034.5  Scale est. = 0.8233    n = 1875
```

2.12 Model B: Putamen Anticipation ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -2.777e-01  3.486e-01  -0.797   0.4258
## hormone_scr_ert_mean                6.491e-04  1.117e-03   0.581   0.5611
## hormone_sal_end_min_since_midnight -2.038e-04  1.214e-04  -1.678   0.0934 .
## interview_age                       4.210e-03  2.766e-03   1.522   0.1281
## MRI_minus_hormone_date_time         1.306e-06  2.595e-06   0.503   0.6148
## bmi                                -5.888e-03  5.455e-03  -1.079   0.2806
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00124
## lmer.REML = 4910.7  Scale est. = 0.63459   n = 1883
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
```

```
## rescaling

##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -2.607e-01  3.492e-01  -0.747   0.4554
## hormone_scr_ert_mean              -1.736e-03  1.217e-03  -1.426   0.1540
## hormone_sal_end_min_since_midnight  1.908e-04  1.235e-04   1.545   0.1226
## interview_age                      3.156e-03  2.752e-03   1.147   0.2517
## MRI_minus_hormone_date_time        7.082e-07  2.859e-06   0.248   0.8044
## bmi                               -1.048e-02  5.630e-03  -1.862   0.0628 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.003
## lmer.REML = 4993.6  Scale est. = 0.61855   n = 1875
```

2.13 Model: Accumbens Anticipation ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling

##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        2.992e-01  2.776e-01   1.078   0.2813
## hormone_scr_ert_mean              -3.193e-04  8.860e-04  -0.360   0.7186
## hormone_sal_end_min_since_midnight -1.197e-04  9.373e-05  -1.277   0.2019
## interview_age                     -3.460e-04  2.199e-03  -0.157   0.8750
## MRI_minus_hormone_date_time       -1.866e-07  2.049e-06  -0.091   0.9274
## bmi                               -7.916e-03  4.348e-03  -1.820   0.0689 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000378
## lmer.REML = 4048.3  Scale est. = 0.40874   n = 1877
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       2.078e-01  2.803e-01   0.741    0.459
## hormone_scr_ert_mean             -2.661e-04  9.778e-04  -0.272    0.786
## hormone_sal_end_min_since_midnight  6.422e-05  9.864e-05   0.651    0.515
## interview_age                    -1.458e-03  2.206e-03  -0.661    0.509
## MRI_minus_hormone_date_time      -3.280e-06  2.337e-06  -1.404    0.161
## bmi                              -3.214e-03  4.496e-03  -0.715    0.475
##
##
## R-sq.(adj) =  -0.000669
## lmer.REML = 4155.8  Scale est. = 0.45644   n = 1870
```

2.14 Model: Caudate Feedback ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       1.115e-01  3.431e-01   0.325  0.74537
## hormone_scr_ert_mean             -1.680e-04  1.095e-03  -0.154  0.87800
## hormone_sal_end_min_since_midnight -3.164e-04  1.200e-04  -2.636  0.00845 **
## interview_age                     8.584e-04  2.721e-03   0.315  0.75248
## MRI_minus_hormone_date_time      -4.142e-07  2.546e-06  -0.163  0.87076
## bmi                               1.485e-03  5.326e-03   0.279  0.78033
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) =  0.0023
## lmer.REML =   4828  Scale est. = 0.66703   n = 1879
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       2.168e-01  3.514e-01   0.617   0.5373
## hormone_scr_ert_mean             -1.089e-03  1.218e-03  -0.894   0.3715
## hormone_sal_end_min_since_midnight -2.954e-04  1.204e-04  -2.453   0.0143 *
## interview_age                     -3.983e-04  2.766e-03  -0.144   0.8855
## MRI_minus_hormone_date_time        3.306e-06  2.846e-06   1.161   0.2457
## bmi                                4.882e-03  5.619e-03   0.869   0.3850
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00146
## lmer.REML = 5025.4  Scale est. = 0.82169   n = 1876
```

2.15 Model: Putamen Feedback ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       3.506e-01  3.384e-01   1.036  0.30022
## hormone_scr_ert_mean              6.880e-04  1.083e-03   0.636  0.52515
## hormone_sal_end_min_since_midnight -3.509e-04  1.208e-04  -2.905  0.00371 **
## interview_age                     -9.285e-04  2.682e-03  -0.346  0.72926
```

```
## MRI_minus_hormone_date_time         4.481e-07  2.527e-06   0.177  0.85925
## bmi                                 1.985e-04  5.264e-03   0.038  0.96993
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00314
## lmer.REML = 4784.2  Scale est. = 0.70994   n = 1882
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         4.163e-01  3.473e-01   1.199    0.231
## hormone_scr_ert_mean               -1.504e-03  1.209e-03  -1.244    0.214
## hormone_sal_end_min_since_midnight -1.810e-04  1.272e-04  -1.423    0.155
## interview_age                      -3.070e-03  2.733e-03  -1.123    0.262
## MRI_minus_hormone_date_time         2.155e-06  2.842e-06   0.758    0.448
## bmi                                 8.574e-03  5.561e-03   1.542    0.123
##
##
## R-sq.(adj) =  0.000645
## lmer.REML = 4971.9  Scale est. = 0.78526   n = 1880
```

2.16 Model: Accumbens Feedback ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)                          -3.405e-01  2.737e-01  -1.244    0.214
## hormone_scr_ert_mean                 -7.442e-04  8.737e-04  -0.852    0.394
## hormone_sal_end_min_since_midnight -8.679e-05  9.611e-05  -0.903    0.367
## interview_age                         2.946e-03  2.169e-03   1.358    0.174
## MRI_minus_hormone_date_time           7.288e-07  2.032e-06   0.359    0.720
## bmi                                   3.665e-03  4.255e-03   0.861    0.389
##
##
## R-sq.(adj) =  -0.000193
## lmer.REML = 3977.6  Scale est. = 0.43779   n = 1878
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          4.558e-02  2.847e-01   0.160    0.873
## hormone_scr_ert_mean                -5.079e-05  9.918e-04  -0.051    0.959
## hormone_sal_end_min_since_midnight -1.148e-04  1.036e-04  -1.108    0.268
## interview_age                       -5.780e-04  2.241e-03  -0.258    0.797
## MRI_minus_hormone_date_time         -2.009e-06  2.389e-06  -0.841    0.400
## bmi                                  7.005e-03  4.592e-03   1.526    0.127
##
##
## R-sq.(adj) =  -0.000232
## lmer.REML = 4210.7  Scale est. = 0.48702   n = 1875
```

2.17 Model: OFC Anticipation ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
```

```
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         1.841e-01  2.205e-01   0.835   0.4038
## hormone_scr_ert_mean                1.491e-03  7.079e-04   2.107   0.0353 *
## hormone_sal_end_min_since_midnight -7.359e-05  7.601e-05  -0.968   0.3331
## interview_age                      -1.303e-03  1.748e-03  -0.745   0.4562
## MRI_minus_hormone_date_time        -1.757e-06  1.630e-06  -1.078   0.2813
## bmi                                -7.956e-04  3.418e-03  -0.233   0.8160
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00127
## lmer.REML = 3151.4  Scale est. = 0.30121   n = 1869
```

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         3.170e-01  2.583e-01   1.227    0.220
## hormone_scr_ert_mean                1.245e-03  8.266e-04   1.506    0.132
## hormone_sal_end_min_since_midnight -2.778e-05  8.996e-05  -0.309    0.758
## interview_age                      -2.712e-03  2.048e-03  -1.324    0.186
## MRI_minus_hormone_date_time         4.763e-07  1.911e-06   0.249    0.803
## bmi                                -1.292e-03  4.001e-03  -0.323    0.747
##
##
## R-sq.(adj) =  -0.000881
## lmer.REML = 3738.9  Scale est. = 0.4132    n = 1871
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
```

```
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -4.222e-01  2.401e-01  -1.759   0.0788 .
## hormone_scr_ert_mean              -1.201e-03  8.343e-04  -1.439   0.1503
## hormone_sal_end_min_since_midnight  1.169e-04  8.559e-05   1.365   0.1723
## interview_age                      3.213e-03  1.891e-03   1.699   0.0895 .
## MRI_minus_hormone_date_time       -1.637e-06  2.016e-06  -0.812   0.4170
## bmi                               -2.476e-03  3.852e-03  -0.643   0.5204
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0015
## lmer.REML = 3556.3  Scale est. = 0.37781   n = 1863
```

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -1.760e-01  2.744e-01  -0.642    0.521
## hormone_scr_ert_mean              -4.029e-04  9.504e-04  -0.424    0.672
## hormone_sal_end_min_since_midnight  1.119e-04  9.436e-05   1.185    0.236
## interview_age                      8.756e-04  2.160e-03   0.405    0.685
## MRI_minus_hormone_date_time       -2.256e-06  2.281e-06  -0.989    0.323
## bmi                               -1.274e-03  4.376e-03  -0.291    0.771
##
##
## R-sq.(adj) =  -0.00147
## lmer.REML = 4068.3  Scale est. = 0.49765   n = 1867
```

2.18 Model: OFC Feedback ~ Testosterone

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
```

```
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         1.029e-01  1.985e-01   0.518    0.604
## hormone_scr_ert_mean                8.350e-04  6.345e-04   1.316    0.188
## hormone_sal_end_min_since_midnight -6.459e-05  6.829e-05  -0.946    0.344
## interview_age                      -8.708e-04  1.576e-03  -0.552    0.581
## MRI_minus_hormone_date_time        -2.159e-06  1.471e-06  -1.468    0.142
## bmi                                 5.942e-05  3.084e-03   0.019    0.985
##
##
## R-sq.(adj) =  0.000721
## lmer.REML = 2794.1  Scale est. = 0.24819   n = 1878

## Warning: Some predictor variables are on very different scales: consider
## rescaling

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -4.512e-02  2.366e-01  -0.191    0.849
## hormone_scr_ert_mean                8.924e-04  7.557e-04   1.181    0.238
## hormone_sal_end_min_since_midnight  1.417e-05  7.995e-05   0.177    0.859
## interview_age                       6.784e-05  1.878e-03   0.036    0.971
## MRI_minus_hormone_date_time        -9.897e-08  1.745e-06  -0.057    0.955
## bmi                                -1.709e-03  3.679e-03  -0.464    0.642
##
##
## R-sq.(adj) =  -0.00184
## lmer.REML = 3472.2  Scale est. = 0.34841   n = 1882
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling

##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)                          1.656e-02  2.123e-01   0.078   0.9378
## hormone_scr_ert_mean                -4.353e-05  7.347e-04  -0.059   0.9528
## hormone_sal_end_min_since_midnight -1.499e-04  7.323e-05  -2.046   0.0409 *
## interview_age                        3.239e-04  1.670e-03   0.194   0.8462
## MRI_minus_hormone_date_time          2.795e-06  1.725e-06   1.621   0.1053
## bmi                                  3.118e-03  3.405e-03   0.916   0.3599
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000991
## lmer.REML = 3097.2  Scale est. = 0.26238   n = 1860

## Warning: Some predictor variables are on very different scales: consider
## rescaling

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          1.279e-01  2.496e-01   0.512   0.6084
## hormone_scr_ert_mean                -6.811e-05  8.655e-04  -0.079   0.9373
## hormone_sal_end_min_since_midnight -1.837e-04  8.623e-05  -2.130   0.0333 *
## interview_age                        2.597e-05  1.965e-03   0.013   0.9895
## MRI_minus_hormone_date_time          4.629e-07  2.085e-06   0.222   0.8243
## bmi                                  2.034e-03  4.006e-03   0.508   0.6116
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -3.23e-05
## lmer.REML =   3719  Scale est. = 0.36675   n = 1866
```

2.19 Model: MID Reaction Time ~ Testosterone

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)                          -5.642e-01  3.552e-01  -1.588   0.1123
## hormone_scr_ert_mean                 -1.298e-03  1.146e-03  -1.132   0.2577
## hormone_sal_end_min_since_midnight -9.477e-05  1.170e-04  -0.810   0.4181
## interview_age                         5.636e-03  2.816e-03   2.001   0.0455 *
## bmi                                   2.401e-03  5.402e-03   0.444   0.6568
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000666
## lmer.REML = 5616.5  Scale est. = 0.73503   n = 2069

##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          -5.884e-01  3.692e-01  -1.594    0.111
## hormone_scr_ert_mean                 -1.077e-03  1.194e-03  -0.902    0.367
## hormone_sal_end_min_since_midnight  3.632e-05  1.242e-04   0.292    0.770
## interview_age                         3.866e-03  2.929e-03   1.320    0.187
## bmi                                   8.138e-03  5.607e-03   1.451    0.147
##
##
## R-sq.(adj) =  0.000119
## lmer.REML = 5765.6  Scale est. = 0.83877   n = 2069
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          -0.6865495  0.3336229  -2.058   0.0397 *
## hormone_scr_ert_mean                 -0.0011824  0.0011702  -1.010   0.3124
## hormone_sal_end_min_since_midnight  0.0001038  0.0001146   0.905   0.3654
## interview_age                         0.0050443  0.0026495   1.904   0.0571 .
## bmi                                   0.0012407  0.0053442   0.232   0.8164
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) =  0.000472
## lmer.REML = 5787.9  Scale est. = 0.84862   n = 2145

##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -3.731e-02  3.303e-01  -0.113    0.910
## hormone_scr_ert_mean               -3.075e-04  1.156e-03  -0.266    0.790
## hormone_sal_end_min_since_midnight  3.782e-06  1.105e-04   0.034    0.973
## interview_age                      -1.175e-04  2.622e-03  -0.045    0.964
## bmi                                 2.200e-03  5.285e-03   0.416    0.677
##
##
## R-sq.(adj) =  -0.00176
## lmer.REML = 5757.7  Scale est. = 0.83868   n = 2145
```

2.20 Model: BIS-BAS-RR ~ Testosterone

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -0.3389836  0.3499559  -0.969 0.332817
## hormone_scr_ert_mean               -0.0007181  0.0011453  -0.627 0.530757
## hormone_sal_end_min_since_midnight  0.0004154  0.0001219   3.408 0.000665 ***
## interview_age                      -0.0030158  0.0027698  -1.089 0.276352
## bmi                                 0.0189249  0.0053136   3.562 0.000376 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0124
## lmer.REML = 7010.6  Scale est. = 0.79429   n = 2467
```

Male participants

```
##
```

```
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      -0.0260260  0.3144471  -0.083   0.9340
## hormone_scr_ert_mean             -0.0022488  0.0010753  -2.091   0.0366 *
## hormone_sal_end_min_since_midnight  0.0001147  0.0001125   1.020   0.3080
## interview_age                     0.0001545  0.0025026   0.062   0.9508
## bmi                               0.0032518  0.0049529   0.657   0.5115
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000409
## lmer.REML = 7450.8  Scale est. = 0.74282   n = 2683
```

4—Internalizing~Puberty x Reward—

4.14 Model: CBCL internalizing factor ~ Testosterone x Accumbens activity (anticipation stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * accumbens_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                         Estimate Std. Error t value
## (Intercept)                           -1.036e+00  2.589e+00  -0.400
## PDS_score                              8.580e-01  2.027e-01   4.233
## hormone_sal_end_min_since_midnight    -4.458e-05  7.958e-04  -0.056
## hormone_scr_ert_mean                  -3.385e-03  7.117e-03  -0.476
## accumbens_rvsn_ant_z                   3.951e-01  3.977e-01   0.993
## race.ethnicity.5levelBlack            -7.031e-01  9.015e-01  -0.780
## race.ethnicity.5levelMixed             8.885e-01  8.677e-01   1.024
## race.ethnicity.5levelOther            -4.640e-01  1.048e+00  -0.443
## race.ethnicity.5levelWhite             1.438e+00  8.032e-01   1.790
```

```
## demo_race_hispanic1                          -9.789e-02  4.027e-01  -0.243
## interview_age                                 2.800e-02  1.804e-02   1.552
## MRI_minus_hormone_date_time                   4.045e-05  1.636e-05   2.473
## bmi                                           3.968e-02  3.641e-02   1.090
## household.income[>=200K]                     -2.105e+00  9.794e-01  -2.149
## household.income[100K-200K]                  -1.204e+00  9.086e-01  -1.326
## household.income[12K-16K]                    -7.987e-03  1.137e+00  -0.007
## household.income[16K-25K]                    -1.267e+00  1.040e+00  -1.218
## household.income[25K-35K]                     3.794e-01  9.531e-01   0.398
## household.income[35K-50K]                    -7.566e-01  9.299e-01  -0.814
## household.income[50K-75K]                    -1.079e+00  9.141e-01  -1.181
## household.income[5K-12K]                      6.143e-02  1.086e+00   0.057
## household.income[75K-100K]                   -9.221e-01  9.194e-01  -1.003
## high.educBachelor                             3.023e-01  8.704e-01   0.347
## high.educHS Diploma/GED                      -3.498e-02  8.801e-01  -0.040
## high.educPost Graduate Degree                 5.985e-01  8.850e-01   0.676
## high.educSome College                         7.723e-01  8.192e-01   0.943
## hormone_scr_ert_mean:accumbens_rvsn_ant_z -1.756e-02  9.241e-03  -1.900
##                                           Pr(>|t|)
## (Intercept)                                 0.6892
## PDS_score                                2.43e-05 ***
## hormone_sal_end_min_since_midnight          0.9553
## hormone_scr_ert_mean                        0.6344
## accumbens_rvsn_ant_z                        0.3207
## race.ethnicity.5levelBlack                  0.4356
## race.ethnicity.5levelMixed                  0.3060
## race.ethnicity.5levelOther                  0.6580
## race.ethnicity.5levelWhite                  0.0736 .
## demo_race_hispanic1                         0.8080
## interview_age                               0.1208
## MRI_minus_hormone_date_time                 0.0135 *
## bmi                                         0.2759
## household.income[>=200K]                    0.0318 *
## household.income[100K-200K]                 0.1851
## household.income[12K-16K]                   0.9944
## household.income[16K-25K]                   0.2233
## household.income[25K-35K]                   0.6906
## household.income[35K-50K]                   0.4160
## household.income[50K-75K]                   0.2378
## household.income[5K-12K]                    0.9549
## household.income[75K-100K]                  0.3160
## high.educBachelor                           0.7284
## high.educHS Diploma/GED                     0.9683
## high.educPost Graduate Degree               0.4989
## high.educSome College                       0.3459
## hormone_scr_ert_mean:accumbens_rvsn_ant_z   0.0576 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0321
## lmer.REML =  10373  Scale est. = 15.422    n = 1690
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * accumbens_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                           Estimate Std. Error t value
## (Intercept)                              2.938e+00  2.690e+00   1.092
## PDS_score                                7.348e-01  2.759e-01   2.663
## hormone_sal_end_min_since_midnight       6.673e-04  8.083e-04   0.826
## hormone_scr_ert_mean                     1.745e-03  7.685e-03   0.227
## accumbens_rvsn_ant_z                    -1.775e-01  3.964e-01  -0.448
## race.ethnicity.5levelBlack               4.374e-02  1.131e+00   0.039
## race.ethnicity.5levelMixed               1.205e+00  1.100e+00   1.095
## race.ethnicity.5levelOther               5.013e-01  1.236e+00   0.406
## race.ethnicity.5levelWhite               1.400e+00  1.038e+00   1.349
## demo_race_hispanic1                     -1.982e-02  4.226e-01  -0.047
## interview_age                            6.345e-03  1.752e-02   0.362
## MRI_minus_hormone_date_time              2.208e-05  1.869e-05   1.181
## bmi                                      8.830e-03  3.770e-02   0.234
## household.income[>=200K]                -3.094e+00  1.028e+00  -3.010
## household.income[100K-200K]             -2.659e+00  9.723e-01  -2.735
## household.income[12K-16K]               -5.514e-01  1.257e+00  -0.439
## household.income[16K-25K]                3.503e-01  1.070e+00   0.327
## household.income[25K-35K]               -8.261e-01  1.049e+00  -0.787
## household.income[35K-50K]               -7.788e-01  1.018e+00  -0.765
## household.income[50K-75K]               -2.106e+00  9.694e-01  -2.173
## household.income[5K-12K]                 1.986e-01  1.112e+00   0.179
## household.income[75K-100K]              -2.773e+00  9.901e-01  -2.801
## high.educBachelor                        1.072e+00  9.799e-01   1.094
## high.educHS Diploma/GED                 -1.200e+00  1.005e+00  -1.194
## high.educPost Graduate Degree            2.143e-01  9.821e-01   0.218
## high.educSome College                    6.400e-01  9.364e-01   0.683
## hormone_scr_ert_mean:accumbens_rvsn_ant_z 3.768e-03  1.141e-02   0.330
##                                          Pr(>|t|)
## (Intercept)                               0.27502
## PDS_score                                 0.00782 **
## hormone_sal_end_min_since_midnight        0.40916
## hormone_scr_ert_mean                      0.82040
## accumbens_rvsn_ant_z                      0.65435
## race.ethnicity.5levelBlack                0.96914
## race.ethnicity.5levelMixed                0.27356
## race.ethnicity.5levelOther                0.68506
## race.ethnicity.5levelWhite                0.17762
```

```
## demo_race_hispanic1                          0.96260
## interview_age                                0.71721
## MRI_minus_hormone_date_time                  0.23775
## bmi                                          0.81484
## household.income[>=200K]                     0.00266 **
## household.income[100K-200K]                  0.00631 **
## household.income[12K-16K]                    0.66094
## household.income[16K-25K]                    0.74342
## household.income[25K-35K]                    0.43120
## household.income[35K-50K]                    0.44423
## household.income[50K-75K]                    0.02992 *
## household.income[5K-12K]                     0.85834
## household.income[75K-100K]                   0.00515 **
## high.educBachelor                            0.27396
## high.educHS Diploma/GED                      0.23258
## high.educPost Graduate Degree                0.82728
## high.educSome College                        0.49442
## hormone_scr_ert_mean:accumbens_rvsn_ant_z  0.74126
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0345
## lmer.REML =  10481  Scale est. = 13.509    n = 1687
```

4.15 Model: CBCL internalizing factor ~ Testosterone x Caudate activity (anticipation stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * caudate_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                        Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          -5.936e-01  2.597e+00  -0.229   0.8192
## PDS_score                             8.216e-01  2.031e-01   4.045 5.47e-05
## hormone_sal_end_min_since_midnight   -8.066e-05  7.996e-04  -0.101   0.9197
## hormone_scr_ert_mean                 -3.738e-03  7.174e-03  -0.521   0.6024
## caudate_rvsn_ant_z                    4.476e-01  3.002e-01   1.491   0.1361
## race.ethnicity.5levelBlack           -7.032e-01  9.056e-01  -0.776   0.4376
## race.ethnicity.5levelMixed            8.952e-01  8.706e-01   1.028   0.3040
## race.ethnicity.5levelOther           -4.115e-01  1.052e+00  -0.391   0.6958
```

```
## race.ethnicity.5levelWhite               1.475e+00  8.061e-01   1.829   0.0675
## demo_race_hispanic1                     -1.433e-01  4.033e-01  -0.355   0.7223
## interview_age                            2.583e-02  1.816e-02   1.423   0.1550
## MRI_minus_hormone_date_time              4.117e-05  1.645e-05   2.502   0.0124
## bmi                                      5.147e-02  3.623e-02   1.421   0.1556
## household.income[>=200K]                -2.472e+00  9.763e-01  -2.532   0.0114
## household.income[100K-200K]             -1.550e+00  9.048e-01  -1.713   0.0869
## household.income[12K-16K]               -2.098e-01  1.142e+00  -0.184   0.8543
## household.income[16K-25K]               -1.566e+00  1.038e+00  -1.509   0.1315
## household.income[25K-35K]               -1.226e-02  9.480e-01  -0.013   0.9897
## household.income[35K-50K]               -1.099e+00  9.247e-01  -1.188   0.2350
## household.income[50K-75K]               -1.393e+00  9.093e-01  -1.532   0.1256
## household.income[5K-12K]                -2.737e-01  1.085e+00  -0.252   0.8008
## household.income[75K-100K]              -1.289e+00  9.166e-01  -1.407   0.1597
## high.educBachelor                        3.095e-01  8.690e-01   0.356   0.7218
## high.educHS Diploma/GED                  3.316e-03  8.823e-01   0.004   0.9970
## high.educPost Graduate Degree            6.590e-01  8.833e-01   0.746   0.4557
## high.educSome College                    7.519e-01  8.192e-01   0.918   0.3588
## hormone_scr_ert_mean:caudate_rvsn_ant_z -1.065e-02  7.347e-03  -1.450   0.1473
##
## (Intercept)
## PDS_score                               ***
## hormone_sal_end_min_since_midnight
## hormone_scr_ert_mean
## caudate_rvsn_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed
## race.ethnicity.5levelOther
## race.ethnicity.5levelWhite              .
## demo_race_hispanic1
## interview_age
## MRI_minus_hormone_date_time             *
## bmi
## household.income[>=200K]                *
## household.income[100K-200K]             .
## household.income[12K-16K]
## household.income[16K-25K]
## household.income[25K-35K]
## household.income[35K-50K]
## household.income[50K-75K]
## household.income[5K-12K]
## household.income[75K-100K]
## high.educBachelor
## high.educHS Diploma/GED
## high.educPost Graduate Degree
## high.educSome College
## hormone_scr_ert_mean:caudate_rvsn_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0295
## lmer.REML =  10410  Scale est. = 15.981    n = 1693
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * caudate_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)                             2.670e+00  2.686e+00   0.994  0.32031
## PDS_score                               7.230e-01  2.781e-01   2.600  0.00940
## hormone_sal_end_min_since_midnight      6.149e-04  8.076e-04   0.761  0.44654
## hormone_scr_ert_mean                    3.983e-04  7.879e-03   0.051  0.95969
## caudate_rvsn_ant_z                      1.512e-01  2.934e-01   0.515  0.60650
## race.ethnicity.5levelBlack              7.687e-02  1.129e+00   0.068  0.94572
## race.ethnicity.5levelMixed              1.281e+00  1.100e+00   1.164  0.24458
## race.ethnicity.5levelOther              4.252e-01  1.235e+00   0.344  0.73076
## race.ethnicity.5levelWhite              1.433e+00  1.039e+00   1.379  0.16817
## demo_race_hispanic1                     6.624e-02  4.253e-01   0.156  0.87626
## interview_age                           7.016e-03  1.757e-02   0.399  0.68966
## MRI_minus_hormone_date_time             1.992e-05  1.824e-05   1.092  0.27493
## bmi                                     1.236e-02  3.786e-02   0.327  0.74407
## household.income[>=200K]               -2.962e+00  1.018e+00  -2.908  0.00368
## household.income[100K-200K]            -2.454e+00  9.619e-01  -2.552  0.01081
## household.income[12K-16K]               1.788e-02  1.259e+00   0.014  0.98867
## household.income[16K-25K]               6.702e-01  1.059e+00   0.633  0.52692
## household.income[25K-35K]              -5.749e-01  1.043e+00  -0.551  0.58148
## household.income[35K-50K]              -6.403e-01  1.009e+00  -0.635  0.52561
## household.income[50K-75K]              -1.824e+00  9.590e-01  -1.902  0.05735
## household.income[5K-12K]                5.383e-01  1.108e+00   0.486  0.62705
## household.income[75K-100K]             -2.503e+00  9.783e-01  -2.559  0.01059
## high.educBachelor                       1.070e+00  9.646e-01   1.109  0.26741
## high.educHS Diploma/GED                -1.256e+00  9.903e-01  -1.268  0.20494
## high.educPost Graduate Degree           2.403e-01  9.678e-01   0.248  0.80392
## high.educSome College                   6.157e-01  9.224e-01   0.668  0.50452
## hormone_scr_ert_mean:caudate_rvsn_ant_z -1.581e-03  8.069e-03  -0.196  0.84470
##
## (Intercept)
## PDS_score                               **
## hormone_sal_end_min_since_midnight
## hormone_scr_ert_mean
## caudate_rvsn_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed
## race.ethnicity.5levelOther
## race.ethnicity.5levelWhite
```

```
## demo_race_hispanic1
## interview_age
## MRI_minus_hormone_date_time
## bmi
## household.income[>=200K]                **
## household.income[100K-200K]             *
## household.income[12K-16K]
## household.income[16K-25K]
## household.income[25K-35K]
## household.income[35K-50K]
## household.income[50K-75K]               .
## household.income[5K-12K]
## household.income[75K-100K]              *
## high.educBachelor
## high.educHS Diploma/GED
## high.educPost Graduate Degree
## high.educSome College
## hormone_scr_ert_mean:caudate_rvsn_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0354
## lmer.REML =  10518  Scale est. = 13.504    n = 1692
```

4.16 Model: CBCL internalizing factor ~ Testosterone x Putamen activity (anticipation stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * putamen_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                        Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          -9.014e-01  2.598e+00  -0.347   0.7287
## PDS_score                             8.284e-01  2.033e-01   4.075 4.82e-05
## hormone_sal_end_min_since_midnight    3.083e-05  7.981e-04   0.039   0.9692
## hormone_scr_ert_mean                 -2.435e-03  7.132e-03  -0.341   0.7329
## putamen_rvsn_ant_z                    3.109e-01  2.992e-01   1.039   0.2988
## race.ethnicity.5levelBlack           -7.084e-01  9.052e-01  -0.783   0.4340
## race.ethnicity.5levelMixed            9.295e-01  8.708e-01   1.067   0.2860
## race.ethnicity.5levelOther           -4.371e-01  1.051e+00  -0.416   0.6775
```

```
## race.ethnicity.5levelWhite               1.498e+00  8.062e-01   1.858   0.0633
## demo_race_hispanic1                     -1.326e-01  4.034e-01  -0.329   0.7424
## interview_age                            2.593e-02  1.814e-02   1.430   0.1530
## MRI_minus_hormone_date_time              4.024e-05  1.643e-05   2.449   0.0144
## bmi                                      4.828e-02  3.645e-02   1.325   0.1855
## household.income[>=200K]                -2.335e+00  9.829e-01  -2.376   0.0176
## household.income[100K-200K]             -1.380e+00  9.131e-01  -1.511   0.1309
## household.income[12K-16K]               -1.147e-01  1.144e+00  -0.100   0.9201
## household.income[16K-25K]               -1.308e+00  1.048e+00  -1.248   0.2123
## household.income[25K-35K]                1.611e-01  9.575e-01   0.168   0.8664
## household.income[35K-50K]               -8.786e-01  9.346e-01  -0.940   0.3473
## household.income[50K-75K]               -1.209e+00  9.176e-01  -1.318   0.1877
## household.income[5K-12K]                -7.454e-02  1.093e+00  -0.068   0.9457
## household.income[75K-100K]              -1.104e+00  9.242e-01  -1.195   0.2323
## high.educBachelor                        3.544e-01  8.651e-01   0.410   0.6821
## high.educHS Diploma/GED                  1.994e-03  8.772e-01   0.002   0.9982
## high.educPost Graduate Degree            6.876e-01  8.795e-01   0.782   0.4345
## high.educSome College                    7.782e-01  8.146e-01   0.955   0.3396
## hormone_scr_ert_mean:putamen_rvsn_ant_z -4.890e-03  7.284e-03  -0.671   0.5021
##
## (Intercept)
## PDS_score                               ***
## hormone_sal_end_min_since_midnight
## hormone_scr_ert_mean
## putamen_rvsn_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed
## race.ethnicity.5levelOther
## race.ethnicity.5levelWhite              .
## demo_race_hispanic1
## interview_age
## MRI_minus_hormone_date_time             *
## bmi
## household.income[>=200K]                *
## household.income[100K-200K]
## household.income[12K-16K]
## household.income[16K-25K]
## household.income[25K-35K]
## household.income[35K-50K]
## household.income[50K-75K]
## household.income[5K-12K]
## household.income[75K-100K]
## high.educBachelor
## high.educHS Diploma/GED
## high.educPost Graduate Degree
## high.educSome College
## hormone_scr_ert_mean:putamen_rvsn_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0295
## lmer.REML =  10411  Scale est. = 15.871    n = 1693
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * putamen_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)                             2.854e+00  2.690e+00   1.061  0.28892
## PDS_score                               7.479e-01  2.795e-01   2.676  0.00753
## hormone_sal_end_min_since_midnight      6.376e-04  8.101e-04   0.787  0.43133
## hormone_scr_ert_mean                    7.818e-04  7.807e-03   0.100  0.92024
## putamen_rvsn_ant_z                     -1.498e-01  3.150e-01  -0.476  0.63438
## race.ethnicity.5levelBlack              1.368e-01  1.131e+00   0.121  0.90377
## race.ethnicity.5levelMixed              1.256e+00  1.103e+00   1.138  0.25519
## race.ethnicity.5levelOther              4.495e-01  1.238e+00   0.363  0.71659
## race.ethnicity.5levelWhite              1.403e+00  1.042e+00   1.347  0.17802
## demo_race_hispanic1                     4.462e-02  4.242e-01   0.105  0.91623
## interview_age                           4.644e-03  1.760e-02   0.264  0.79198
## MRI_minus_hormone_date_time             2.237e-05  1.831e-05   1.222  0.22201
## bmi                                     1.059e-02  3.798e-02   0.279  0.78037
## household.income[>=200K]               -2.974e+00  1.018e+00  -2.921  0.00354
## household.income[100K-200K]            -2.521e+00  9.616e-01  -2.621  0.00884
## household.income[12K-16K]              -2.394e-01  1.251e+00  -0.191  0.84822
## household.income[16K-25K]               5.645e-01  1.057e+00   0.534  0.59321
## household.income[25K-35K]              -6.635e-01  1.041e+00  -0.637  0.52405
## household.income[35K-50K]              -7.069e-01  1.009e+00  -0.701  0.48366
## household.income[50K-75K]              -1.875e+00  9.588e-01  -1.956  0.05064
## household.income[5K-12K]                2.405e-01  1.100e+00   0.219  0.82693
## household.income[75K-100K]             -2.539e+00  9.790e-01  -2.593  0.00959
## high.educBachelor                       1.223e+00  9.583e-01   1.276  0.20200
## high.educHS Diploma/GED                -1.160e+00  9.841e-01  -1.178  0.23881
## high.educPost Graduate Degree           3.907e-01  9.619e-01   0.406  0.68464
## high.educSome College                   7.316e-01  9.146e-01   0.800  0.42383
## hormone_scr_ert_mean:putamen_rvsn_ant_z 2.453e-03  8.901e-03   0.276  0.78293
##
## (Intercept)
## PDS_score                              **
## hormone_sal_end_min_since_midnight
## hormone_scr_ert_mean
## putamen_rvsn_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed
## race.ethnicity.5levelOther
## race.ethnicity.5levelWhite
```

```
## demo_race_hispanic1
## interview_age
## MRI_minus_hormone_date_time
## bmi
## household.income[>=200K]                **
## household.income[100K-200K]             **
## household.income[12K-16K]
## household.income[16K-25K]
## household.income[25K-35K]
## household.income[35K-50K]
## household.income[50K-75K]               .
## household.income[5K-12K]
## household.income[75K-100K]              **
## high.educBachelor
## high.educHS Diploma/GED
## high.educPost Graduate Degree
## high.educSome College
## hormone_scr_ert_mean:putamen_rvsn_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0336
## lmer.REML =  10530  Scale est. = 13.681    n = 1693
```

4.17 Model: CBCL internalizing factor ~ Testosterone x Accumbens activity (feedback stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * accumbens_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                               Estimate Std. Error
## (Intercept)                                 -9.234e-01  2.603e+00
## PDS_score                                    8.083e-01  2.045e-01
## hormone_sal_end_min_since_midnight           4.858e-05  8.000e-04
## hormone_scr_ert_mean                        -2.842e-03  7.186e-03
## accumbens_posvsneg_feedback_z                3.127e-01  4.027e-01
## race.ethnicity.5levelBlack                  -6.449e-01  9.081e-01
## race.ethnicity.5levelMixed                   9.574e-01  8.719e-01
## race.ethnicity.5levelOther                  -3.402e-01  1.049e+00
```

```
## race.ethnicity.5levelWhite                                1.489e+00  8.065e-01
## demo_race_hispanic1                                       -1.704e-01  4.072e-01
## interview_age                                              2.621e-02  1.818e-02
## MRI_minus_hormone_date_time                                3.958e-05  1.643e-05
## bmi                                                        4.751e-02  3.640e-02
## household.income[>=200K]                                  -2.263e+00  9.832e-01
## household.income[100K-200K]                               -1.268e+00  9.127e-01
## household.income[12K-16K]                                 -4.706e-02  1.143e+00
## household.income[16K-25K]                                 -1.316e+00  1.046e+00
## household.income[25K-35K]                                  2.361e-01  9.561e-01
## household.income[35K-50K]                                 -8.051e-01  9.353e-01
## household.income[50K-75K]                                 -1.115e+00  9.189e-01
## household.income[5K-12K]                                  -1.485e-01  1.099e+00
## household.income[75K-100K]                                -9.881e-01  9.254e-01
## high.educBachelor                                          2.910e-01  8.756e-01
## high.educHS Diploma/GED                                   -3.888e-02  8.852e-01
## high.educPost Graduate Degree                              6.426e-01  8.908e-01
## high.educSome College                                      7.223e-01  8.238e-01
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z        -2.271e-03  9.488e-03
##                                                           t value Pr(>|t|)
## (Intercept)                                                -0.355   0.7228
## PDS_score                                                   3.952 8.08e-05 ***
## hormone_sal_end_min_since_midnight                          0.061   0.9516
## hormone_scr_ert_mean                                       -0.396   0.6925
## accumbens_posvsneg_feedback_z                               0.776   0.4376
## race.ethnicity.5levelBlack                                 -0.710   0.4777
## race.ethnicity.5levelMixed                                  1.098   0.2724
## race.ethnicity.5levelOther                                 -0.324   0.7458
## race.ethnicity.5levelWhite                                  1.846   0.0650 .
## demo_race_hispanic1                                        -0.418   0.6757
## interview_age                                               1.442   0.1496
## MRI_minus_hormone_date_time                                 2.409   0.0161 *
## bmi                                                         1.305   0.1921
## household.income[>=200K]                                   -2.302   0.0215 *
## household.income[100K-200K]                                -1.390   0.1648
## household.income[12K-16K]                                  -0.041   0.9672
## household.income[16K-25K]                                  -1.259   0.2083
## household.income[25K-35K]                                   0.247   0.8050
## household.income[35K-50K]                                  -0.861   0.3895
## household.income[50K-75K]                                  -1.214   0.2250
## household.income[5K-12K]                                   -0.135   0.8925
## household.income[75K-100K]                                 -1.068   0.2858
## high.educBachelor                                           0.332   0.7397
## high.educHS Diploma/GED                                    -0.044   0.9650
## high.educPost Graduate Degree                               0.721   0.4708
## high.educSome College                                       0.877   0.3807
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z         -0.239   0.8109
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0279
## lmer.REML =  10393  Scale est. = 15.817    n = 1690
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * accumbens_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                                    Estimate Std. Error
## (Intercept)                                       3.336e+00  2.704e+00
## PDS_score                                         7.401e-01  2.766e-01
## hormone_sal_end_min_since_midnight                5.356e-04  8.080e-04
## hormone_scr_ert_mean                             -4.977e-05  8.070e-03
## accumbens_posvsneg_feedback_z                    -1.992e-01  3.328e-01
## race.ethnicity.5levelBlack                       -5.196e-02  1.146e+00
## race.ethnicity.5levelMixed                        1.238e+00  1.118e+00
## race.ethnicity.5levelOther                        3.508e-01  1.250e+00
## race.ethnicity.5levelWhite                        1.404e+00  1.057e+00
## demo_race_hispanic1                               5.056e-02  4.215e-01
## interview_age                                     2.253e-03  1.756e-02
## MRI_minus_hormone_date_time                       2.031e-05  1.872e-05
## bmi                                               3.117e-02  3.791e-02
## household.income[>=200K]                         -3.374e+00  1.040e+00
## household.income[100K-200K]                      -3.003e+00  9.836e-01
## household.income[12K-16K]                        -7.067e-01  1.255e+00
## household.income[16K-25K]                         1.461e-01  1.077e+00
## household.income[25K-35K]                        -1.047e+00  1.063e+00
## household.income[35K-50K]                        -1.069e+00  1.029e+00
## household.income[50K-75K]                        -2.338e+00  9.817e-01
## household.income[5K-12K]                         -7.725e-02  1.134e+00
## household.income[75K-100K]                       -3.021e+00  1.002e+00
## high.educBachelor                                 1.235e+00  9.630e-01
## high.educHS Diploma/GED                          -1.152e+00  9.897e-01
## high.educPost Graduate Degree                     4.226e-01  9.658e-01
## high.educSome College                             7.720e-01  9.193e-01
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z -1.517e-03  8.951e-03
##                                                   t value Pr(>|t|)
## (Intercept)                                         1.234  0.21756
## PDS_score                                           2.675  0.00754 **
## hormone_sal_end_min_since_midnight                  0.663  0.50752
## hormone_scr_ert_mean                               -0.006  0.99508
## accumbens_posvsneg_feedback_z                      -0.598  0.54959
## race.ethnicity.5levelBlack                         -0.045  0.96385
## race.ethnicity.5levelMixed                          1.107  0.26830
## race.ethnicity.5levelOther                          0.281  0.77895
## race.ethnicity.5levelWhite                          1.328  0.18450
```

```
## demo_race_hispanic1                                    0.120  0.90453
## interview_age                                          0.128  0.89793
## MRI_minus_hormone_date_time                            1.085  0.27802
## bmi                                                    0.822  0.41098
## household.income[>=200K]                              -3.244  0.00120 **
## household.income[100K-200K]                           -3.053  0.00230 **
## household.income[12K-16K]                             -0.563  0.57358
## household.income[16K-25K]                              0.136  0.89215
## household.income[25K-35K]                             -0.985  0.32482
## household.income[35K-50K]                             -1.039  0.29893
## household.income[50K-75K]                             -2.381  0.01736 *
## household.income[5K-12K]                              -0.068  0.94569
## household.income[75K-100K]                            -3.015  0.00261 **
## high.educBachelor                                      1.282  0.19994
## high.educHS Diploma/GED                               -1.164  0.24458
## high.educPost Graduate Degree                          0.438  0.66174
## high.educSome College                                  0.840  0.40115
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z    -0.169  0.86548
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0365
## lmer.REML =  10511  Scale est. = 13.329    n = 1691
```

4.18 Model: CBCL internalizing factor ~ Testosterone x Caudate activity (Feedback stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * caudate_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                             Estimate Std. Error t value
## (Intercept)                                -7.006e-01  2.592e+00  -0.270
## PDS_score                                   8.054e-01  2.033e-01   3.962
## hormone_sal_end_min_since_midnight         -6.526e-05  7.988e-04  -0.082
## hormone_scr_ert_mean                       -2.270e-03  7.132e-03  -0.318
## caudate_posvsneg_feedback_z                -5.550e-02  3.233e-01  -0.172
## race.ethnicity.5levelBlack                 -7.936e-01  9.084e-01  -0.874
## race.ethnicity.5levelMixed                  8.854e-01  8.718e-01   1.016
## race.ethnicity.5levelOther                 -4.350e-01  1.049e+00  -0.415
```

```
## race.ethnicity.5levelWhite                          1.475e+00  8.072e-01   1.828
## demo_race_hispanic1                                 -1.277e-01  4.039e-01  -0.316
## interview_age                                        2.695e-02  1.815e-02   1.484
## MRI_minus_hormone_date_time                          4.010e-05  1.642e-05   2.442
## bmi                                                  4.877e-02  3.639e-02   1.340
## household.income[>=200K]                            -2.474e+00  9.765e-01  -2.534
## household.income[100K-200K]                         -1.571e+00  9.048e-01  -1.736
## household.income[12K-16K]                           -3.890e-01  1.135e+00  -0.343
## household.income[16K-25K]                           -1.570e+00  1.042e+00  -1.507
## household.income[25K-35K]                           -4.411e-02  9.484e-01  -0.047
## household.income[35K-50K]                           -1.118e+00  9.281e-01  -1.204
## household.income[50K-75K]                           -1.435e+00  9.086e-01  -1.579
## household.income[5K-12K]                            -3.093e-01  1.086e+00  -0.285
## household.income[75K-100K]                          -1.293e+00  9.157e-01  -1.412
## high.educBachelor                                    3.613e-01  8.715e-01   0.415
## high.educHS Diploma/GED                              9.764e-02  8.827e-01   0.111
## high.educPost Graduate Degree                        6.493e-01  8.860e-01   0.733
## high.educSome College                                8.151e-01  8.204e-01   0.993
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z -3.531e-04  7.987e-03  -0.044
##                                                     Pr(>|t|)
## (Intercept)                                          0.7870
## PDS_score                                           7.74e-05 ***
## hormone_sal_end_min_since_midnight                   0.9349
## hormone_scr_ert_mean                                 0.7504
## caudate_posvsneg_feedback_z                          0.8637
## race.ethnicity.5levelBlack                           0.3824
## race.ethnicity.5levelMixed                           0.3100
## race.ethnicity.5levelOther                           0.6783
## race.ethnicity.5levelWhite                           0.0677 .
## demo_race_hispanic1                                  0.7520
## interview_age                                        0.1379
## MRI_minus_hormone_date_time                          0.0147 *
## bmi                                                  0.1804
## household.income[>=200K]                             0.0114 *
## household.income[100K-200K]                          0.0828 .
## household.income[12K-16K]                            0.7319
## household.income[16K-25K]                            0.1320
## household.income[25K-35K]                            0.9629
## household.income[35K-50K]                            0.2287
## household.income[50K-75K]                            0.1145
## household.income[5K-12K]                             0.7758
## household.income[75K-100K]                           0.1580
## high.educBachelor                                    0.6785
## high.educHS Diploma/GED                              0.9119
## high.educPost Graduate Degree                        0.4638
## high.educSome College                                0.3206
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z     0.9647
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0284
## lmer.REML =  10405  Scale est. = 15.952    n = 1692
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * caudate_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                                  Estimate Std. Error t value
## (Intercept)                                     3.134e+00  2.695e+00   1.163
## PDS_score                                       7.201e-01  2.760e-01   2.609
## hormone_sal_end_min_since_midnight              8.403e-04  8.052e-04   1.044
## hormone_scr_ert_mean                           -1.233e-07  7.663e-03   0.000
## caudate_posvsneg_feedback_z                    -6.839e-02  3.204e-01  -0.213
## race.ethnicity.5levelBlack                      8.852e-03  1.137e+00   0.008
## race.ethnicity.5levelMixed                      1.179e+00  1.105e+00   1.067
## race.ethnicity.5levelOther                      3.435e-01  1.241e+00   0.277
## race.ethnicity.5levelWhite                      1.311e+00  1.045e+00   1.254
## demo_race_hispanic1                             4.502e-02  4.214e-01   0.107
## interview_age                                   2.870e-03  1.757e-02   0.163
## MRI_minus_hormone_date_time                     2.009e-05  1.819e-05   1.104
## bmi                                             1.342e-02  3.773e-02   0.356
## household.income[>=200K]                       -3.019e+00  1.024e+00  -2.948
## household.income[100K-200K]                    -2.606e+00  9.676e-01  -2.693
## household.income[12K-16K]                      -3.907e-01  1.246e+00  -0.314
## household.income[16K-25K]                       4.542e-01  1.066e+00   0.426
## household.income[25K-35K]                      -6.689e-01  1.047e+00  -0.639
## household.income[35K-50K]                      -7.096e-01  1.014e+00  -0.700
## household.income[50K-75K]                      -1.974e+00  9.653e-01  -2.044
## household.income[5K-12K]                       -5.525e-02  1.117e+00  -0.049
## household.income[75K-100K]                     -2.639e+00  9.849e-01  -2.680
## high.educBachelor                               1.190e+00  9.646e-01   1.234
## high.educHS Diploma/GED                        -1.144e+00  9.950e-01  -1.149
## high.educPost Graduate Degree                   3.379e-01  9.674e-01   0.349
## high.educSome College                           6.875e-01  9.199e-01   0.747
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z -7.623e-04  9.096e-03  -0.084
##                                                 Pr(>|t|)
## (Intercept)                                      0.24514
## PDS_score                                        0.00917 **
## hormone_sal_end_min_since_midnight               0.29685
## hormone_scr_ert_mean                             0.99999
## caudate_posvsneg_feedback_z                      0.83098
## race.ethnicity.5levelBlack                       0.99379
## race.ethnicity.5levelMixed                       0.28618
## race.ethnicity.5levelOther                       0.78192
## race.ethnicity.5levelWhite                       0.20989
```

```
## demo_race_hispanic1                                  0.91493
## interview_age                                        0.87024
## MRI_minus_hormone_date_time                          0.26959
## bmi                                                  0.72212
## household.income[>=200K]                             0.00324 **
## household.income[100K-200K]                          0.00715 **
## household.income[12K-16K]                            0.75389
## household.income[16K-25K]                            0.67014
## household.income[25K-35K]                            0.52295
## household.income[35K-50K]                            0.48394
## household.income[50K-75K]                            0.04106 *
## household.income[5K-12K]                             0.96057
## household.income[75K-100K]                           0.00744 **
## high.educBachelor                                    0.21739
## high.educHS Diploma/GED                              0.25060
## high.educPost Graduate Degree                        0.72690
## high.educSome College                                0.45493
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z     0.93322
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0331
## lmer.REML =  10513  Scale est. = 13.246    n = 1691
```

4.19 Model: CBCL internalizing factor ~ Testosterone x Putamen activity (Feedback stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * putamen_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                              Estimate Std. Error t value
## (Intercept)                                -8.287e-01  2.594e+00  -0.319
## PDS_score                                   8.591e-01  2.038e-01   4.216
## hormone_sal_end_min_since_midnight         -3.923e-05  8.008e-04  -0.049
## hormone_scr_ert_mean                       -2.577e-03  7.141e-03  -0.361
## putamen_posvsneg_feedback_z                 6.895e-02  3.161e-01   0.218
## race.ethnicity.5levelBlack                 -6.743e-01  9.056e-01  -0.745
## race.ethnicity.5levelMixed                  9.208e-01  8.707e-01   1.058
## race.ethnicity.5levelOther                 -5.111e-01  1.050e+00  -0.487
```

```
## race.ethnicity.5levelWhite                          1.504e+00  8.060e-01   1.865
## demo_race_hispanic1                                 -5.250e-02  4.050e-01  -0.130
## interview_age                                        2.606e-02  1.811e-02   1.439
## MRI_minus_hormone_date_time                          4.046e-05  1.641e-05   2.465
## bmi                                                  4.087e-02  3.640e-02   1.123
## household.income[>=200K]                            -2.286e+00  9.806e-01  -2.331
## household.income[100K-200K]                         -1.348e+00  9.103e-01  -1.481
## household.income[12K-16K]                           -1.290e-01  1.142e+00  -0.113
## household.income[16K-25K]                           -1.308e+00  1.044e+00  -1.254
## household.income[25K-35K]                            2.268e-01  9.540e-01   0.238
## household.income[35K-50K]                           -8.415e-01  9.336e-01  -0.901
## household.income[50K-75K]                           -1.162e+00  9.161e-01  -1.268
## household.income[5K-12K]                            -1.513e-02  1.091e+00  -0.014
## household.income[75K-100K]                          -1.091e+00  9.215e-01  -1.184
## high.educBachelor                                    3.667e-01  8.708e-01   0.421
## high.educHS Diploma/GED                             -4.515e-02  8.818e-01  -0.051
## high.educPost Graduate Degree                        6.810e-01  8.842e-01   0.770
## high.educSome College                                7.804e-01  8.193e-01   0.953
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z    -5.417e-03  7.452e-03  -0.727
##                                                     Pr(>|t|)
## (Intercept)                                          0.7494
## PDS_score                                           2.62e-05 ***
## hormone_sal_end_min_since_midnight                   0.9609
## hormone_scr_ert_mean                                 0.7182
## putamen_posvsneg_feedback_z                          0.8274
## race.ethnicity.5levelBlack                           0.4566
## race.ethnicity.5levelMixed                           0.2904
## race.ethnicity.5levelOther                           0.6265
## race.ethnicity.5levelWhite                           0.0623 .
## demo_race_hispanic1                                  0.8969
## interview_age                                        0.1504
## MRI_minus_hormone_date_time                          0.0138 *
## bmi                                                  0.2617
## household.income[>=200K]                             0.0199 *
## household.income[100K-200K]                          0.1387
## household.income[12K-16K]                            0.9101
## household.income[16K-25K]                            0.2101
## household.income[25K-35K]                            0.8121
## household.income[35K-50K]                            0.3675
## household.income[50K-75K]                            0.2050
## household.income[5K-12K]                             0.9889
## household.income[75K-100K]                           0.2365
## high.educBachelor                                    0.6737
## high.educHS Diploma/GED                              0.9592
## high.educPost Graduate Degree                        0.4413
## high.educSome College                                0.3410
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z     0.4674
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0297
## lmer.REML =  10403  Scale est. = 16.377    n = 1692
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * putamen_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                                 Estimate Std. Error t value
## (Intercept)                                    3.183e+00  2.709e+00   1.175
## PDS_score                                      7.023e-01  2.766e-01   2.539
## hormone_sal_end_min_since_midnight             7.726e-04  8.049e-04   0.960
## hormone_scr_ert_mean                           5.367e-04  7.748e-03   0.069
## putamen_posvsneg_feedback_z                    1.702e-01  3.192e-01   0.533
## race.ethnicity.5levelBlack                     4.287e-02  1.138e+00   0.038
## race.ethnicity.5levelMixed                     1.232e+00  1.108e+00   1.112
## race.ethnicity.5levelOther                     3.960e-01  1.243e+00   0.319
## race.ethnicity.5levelWhite                     1.370e+00  1.047e+00   1.309
## demo_race_hispanic1                            1.264e-03  4.208e-01   0.003
## interview_age                                  3.314e-03  1.758e-02   0.189
## MRI_minus_hormone_date_time                    1.933e-05  1.822e-05   1.061
## bmi                                            1.844e-02  3.766e-02   0.490
## household.income[>=200K]                      -3.107e+00  1.031e+00  -3.014
## household.income[100K-200K]                   -2.716e+00  9.744e-01  -2.787
## household.income[12K-16K]                     -4.710e-01  1.251e+00  -0.376
## household.income[16K-25K]                      3.500e-01  1.076e+00   0.325
## household.income[25K-35K]                     -7.586e-01  1.054e+00  -0.720
## household.income[35K-50K]                     -7.962e-01  1.020e+00  -0.781
## household.income[50K-75K]                     -2.028e+00  9.725e-01  -2.086
## household.income[5K-12K]                      -1.731e-01  1.125e+00  -0.154
## household.income[75K-100K]                    -2.714e+00  9.920e-01  -2.736
## high.educBachelor                              1.068e+00  9.708e-01   1.100
## high.educHS Diploma/GED                       -1.259e+00  1.001e+00  -1.258
## high.educPost Graduate Degree                  2.660e-01  9.735e-01   0.273
## high.educSome College                          6.059e-01  9.268e-01   0.654
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -3.054e-03  9.207e-03  -0.332
##                                                Pr(>|t|)
## (Intercept)                                     0.24017
## PDS_score                                       0.01119 *
## hormone_sal_end_min_since_midnight              0.33726
## hormone_scr_ert_mean                            0.94478
## putamen_posvsneg_feedback_z                     0.59380
## race.ethnicity.5levelBlack                      0.96996
## race.ethnicity.5levelMixed                      0.26626
## race.ethnicity.5levelOther                      0.75006
## race.ethnicity.5levelWhite                      0.19084
```

```
## demo_race_hispanic1                                0.99760
## interview_age                                      0.85050
## MRI_minus_hormone_date_time                        0.28888
## bmi                                                0.62440
## household.income[>=200K]                           0.00262 **
## household.income[100K-200K]                        0.00538 **
## household.income[12K-16K]                          0.70667
## household.income[16K-25K]                          0.74511
## household.income[25K-35K]                          0.47183
## household.income[35K-50K]                          0.43520
## household.income[50K-75K]                          0.03715 *
## household.income[5K-12K]                           0.87774
## household.income[75K-100K]                         0.00628 **
## high.educBachelor                                  0.27128
## high.educHS Diploma/GED                            0.20870
## high.educPost Graduate Degree                      0.78469
## high.educSome College                              0.51335
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z   0.74013
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0326
## lmer.REML =  10542  Scale est. = 13.541    n = 1695
```

4.20 Model: CBCL internalizing factor ~ Testosterone x Lateral OFC activity (anticipation stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * lOFC_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -5.604e-01  2.615e+00  -0.214 0.830327
## PDS_score                          7.958e-01  2.057e-01   3.868 0.000114 ***
## hormone_sal_end_min_since_midnight -1.416e-04  8.014e-04  -0.177 0.859784
## hormone_scr_ert_mean               -3.822e-03  7.233e-03  -0.529 0.597219
## lOFC_rvsn_ant_z                    6.434e-01  4.953e-01   1.299 0.194115
## race.ethnicity.5levelBlack         -6.959e-01  9.091e-01  -0.766 0.444072
## race.ethnicity.5levelMixed         9.286e-01  8.736e-01   1.063 0.287944
## race.ethnicity.5levelOther         -2.956e-01  1.053e+00  -0.281 0.779051
```

```
## race.ethnicity.5levelWhite            1.488e+00  8.080e-01   1.842 0.065702 .
## demo_race_hispanic1                  -1.554e-01  4.056e-01  -0.383 0.701667
## interview_age                         2.751e-02  1.825e-02   1.507 0.132012
## MRI_minus_hormone_date_time           3.992e-05  1.649e-05   2.422 0.015559 *
## bmi                                   5.175e-02  3.647e-02   1.419 0.156039
## household.income[>=200K]             -2.660e+00  9.898e-01  -2.688 0.007270 **
## household.income[100K-200K]          -1.748e+00  9.196e-01  -1.901 0.057514 .
## household.income[12K-16K]            -3.862e-01  1.151e+00  -0.336 0.737280
## household.income[16K-25K]            -1.683e+00  1.051e+00  -1.601 0.109537
## household.income[25K-35K]            -2.182e-01  9.635e-01  -0.226 0.820857
## household.income[35K-50K]            -1.217e+00  9.417e-01  -1.292 0.196514
## household.income[50K-75K]            -1.519e+00  9.235e-01  -1.645 0.100234
## household.income[5K-12K]             -4.631e-01  1.101e+00  -0.420 0.674211
## household.income[75K-100K]           -1.456e+00  9.303e-01  -1.565 0.117865
## high.educBachelor                     3.469e-01  8.903e-01   0.390 0.696851
## high.educHS Diploma/GED              -1.424e-02  9.020e-01  -0.016 0.987404
## high.educPost Graduate Degree         7.118e-01  9.052e-01   0.786 0.431731
## high.educSome College                 7.654e-01  8.389e-01   0.912 0.361659
## hormone_scr_ert_mean:lOFC_rvsn_ant_z -1.102e-02  1.254e-02  -0.879 0.379582
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.029
## lmer.REML =  10341  Scale est. = 15.842    n = 1681
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * lOFC_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         2.456e+00  2.687e+00   0.914   0.3609
## PDS_score                           6.501e-01  2.791e-01   2.329   0.0200 *
## hormone_sal_end_min_since_midnight  5.157e-04  8.089e-04   0.638   0.5239
## hormone_scr_ert_mean                6.603e-04  7.756e-03   0.085   0.9322
## lOFC_rvsn_ant_z                     2.521e-01  4.635e-01   0.544   0.5865
## race.ethnicity.5levelBlack         -4.067e-03  1.143e+00  -0.004   0.9972
## race.ethnicity.5levelMixed          1.212e+00  1.110e+00   1.092   0.2751
## race.ethnicity.5levelOther          4.615e-01  1.241e+00   0.372   0.7101
## race.ethnicity.5levelWhite          1.380e+00  1.049e+00   1.316   0.1883
## demo_race_hispanic1                -2.762e-03  4.233e-01  -0.007   0.9948
```

```
## interview_age                          7.902e-03  1.746e-02   0.452   0.6510
## MRI_minus_hormone_date_time            2.263e-05  1.870e-05   1.210   0.2264
## bmi                                    9.962e-03  3.752e-02   0.265   0.7907
## household.income[>=200K]              -2.461e+00  1.042e+00  -2.362   0.0183 *
## household.income[100K-200K]           -2.030e+00  9.873e-01  -2.057   0.0399 *
## household.income[12K-16K]              1.648e-01  1.276e+00   0.129   0.8973
## household.income[16K-25K]              1.097e+00  1.084e+00   1.012   0.3117
## household.income[25K-35K]             -1.928e-01  1.062e+00  -0.182   0.8560
## household.income[35K-50K]             -1.910e-01  1.030e+00  -0.186   0.8528
## household.income[50K-75K]             -1.469e+00  9.855e-01  -1.490   0.1363
## household.income[5K-12K]               5.713e-01  1.129e+00   0.506   0.6130
## household.income[75K-100K]            -2.125e+00  1.004e+00  -2.116   0.0345 *
## high.educBachelor                      1.033e+00  9.516e-01   1.085   0.2780
## high.educHS Diploma/GED               -1.142e+00  9.876e-01  -1.157   0.2475
## high.educPost Graduate Degree          1.685e-01  9.543e-01   0.177   0.8599
## high.educSome College                  5.203e-01  9.092e-01   0.572   0.5672
## hormone_scr_ert_mean:lOFC_rvsn_ant_z -1.211e-02  1.262e-02  -0.960   0.3372
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.033
## lmer.REML =  10418  Scale est. = 13.465    n = 1681
```

4.21 Model: CBCL internalizing factor ~ Testosterone x Medial OFC activity (anticipation stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * mOFC_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         -7.550e-01  2.613e+00  -0.289 0.772639
## PDS_score                            7.898e-01  2.060e-01   3.834 0.000131 ***
## hormone_sal_end_min_since_midnight  -1.469e-04  8.012e-04  -0.183 0.854593
## hormone_scr_ert_mean                -3.520e-03  7.193e-03  -0.489 0.624653
## mOFC_rvsn_ant_z                      5.183e-01  4.299e-01   1.206 0.228132
## race.ethnicity.5levelBlack          -6.873e-01  9.084e-01  -0.757 0.449383
## race.ethnicity.5levelMixed           8.988e-01  8.741e-01   1.028 0.303979
## race.ethnicity.5levelOther          -3.087e-01  1.052e+00  -0.294 0.769152
## race.ethnicity.5levelWhite           1.509e+00  8.078e-01   1.868 0.061904 .
```

```
## demo_race_hispanic1                  -1.804e-01  4.057e-01  -0.445 0.656691
## interview_age                         2.830e-02  1.825e-02   1.551 0.121111
## MRI_minus_hormone_date_time           3.954e-05  1.647e-05   2.400 0.016487 *
## bmi                                   5.394e-02  3.646e-02   1.479 0.139254
## household.income[>=200K]             -2.798e+00  9.893e-01  -2.828 0.004741 **
## household.income[100K-200K]          -1.792e+00  9.193e-01  -1.949 0.051412 .
## household.income[12K-16K]            -5.008e-01  1.145e+00  -0.438 0.661759
## household.income[16K-25K]            -1.692e+00  1.050e+00  -1.611 0.107373
## household.income[25K-35K]            -2.222e-01  9.602e-01  -0.231 0.816978
## household.income[35K-50K]            -1.287e+00  9.418e-01  -1.367 0.171965
## household.income[50K-75K]            -1.589e+00  9.225e-01  -1.723 0.085112 .
## household.income[5K-12K]             -5.095e-01  1.102e+00  -0.462 0.643815
## household.income[75K-100K]           -1.518e+00  9.299e-01  -1.632 0.102794
## high.educBachelor                     4.820e-01  8.845e-01   0.545 0.585901
## high.educHS Diploma/GED               9.315e-02  8.937e-01   0.104 0.917004
## high.educPost Graduate Degree         8.319e-01  9.000e-01   0.924 0.355411
## high.educSome College                 8.598e-01  8.323e-01   1.033 0.301736
## hormone_scr_ert_mean:mOFC_rvsn_ant_z -7.987e-03  1.066e-02  -0.749 0.453734
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0297
## lmer.REML =  10346  Scale est. = 15.65     n = 1682
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * mOFC_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          2.820e+00  2.696e+00   1.046  0.29559
## PDS_score                            7.249e-01  2.794e-01   2.594  0.00956 **
## hormone_sal_end_min_since_midnight   3.841e-04  8.101e-04   0.474  0.63546
## hormone_scr_ert_mean                 1.307e-03  7.745e-03   0.169  0.86601
## mOFC_rvsn_ant_z                     -9.729e-02  3.989e-01  -0.244  0.80736
## race.ethnicity.5levelBlack           1.026e-01  1.149e+00   0.089  0.92889
## race.ethnicity.5levelMixed           1.191e+00  1.115e+00   1.068  0.28570
## race.ethnicity.5levelOther           4.989e-01  1.250e+00   0.399  0.68980
## race.ethnicity.5levelWhite           1.398e+00  1.055e+00   1.326  0.18512
## demo_race_hispanic1                 -2.226e-02  4.241e-01  -0.052  0.95815
## interview_age                        8.414e-03  1.755e-02   0.479  0.63167
```

```
## MRI_minus_hormone_date_time           2.147e-05  1.872e-05   1.147  0.25146
## bmi                                   1.094e-02  3.766e-02   0.291  0.77143
## household.income[>=200K]             -3.077e+00  1.034e+00  -2.976  0.00296 **
## household.income[100K-200K]          -2.688e+00  9.784e-01  -2.747  0.00608 **
## household.income[12K-16K]            -4.925e-01  1.252e+00  -0.393  0.69410
## household.income[16K-25K]             3.765e-01  1.074e+00   0.351  0.72595
## household.income[25K-35K]            -9.465e-01  1.056e+00  -0.897  0.36998
## household.income[35K-50K]            -7.921e-01  1.022e+00  -0.775  0.43855
## household.income[50K-75K]            -2.132e+00  9.751e-01  -2.186  0.02893 *
## household.income[5K-12K]             -5.711e-02  1.123e+00  -0.051  0.95946
## household.income[75K-100K]           -2.738e+00  9.954e-01  -2.751  0.00601 **
## high.educBachelor                     1.163e+00  9.553e-01   1.217  0.22362
## high.educHS Diploma/GED              -1.132e+00  9.890e-01  -1.145  0.25238
## high.educPost Graduate Degree         3.410e-01  9.580e-01   0.356  0.72190
## high.educSome College                 7.339e-01  9.112e-01   0.805  0.42069
## hormone_scr_ert_mean:mOFC_rvsn_ant_z -2.881e-03  1.103e-02  -0.261  0.79402
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0321
## lmer.REML =  10477  Scale est. = 13.409    n = 1687
```

4.22 Model: CBCL internalizing factor ~ Testosterone x Lateral OFC activity (feedback stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * lOFC_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                          Estimate Std. Error t value
## (Intercept)                            -7.804e-01  2.598e+00  -0.300
## PDS_score                               7.584e-01  2.051e-01   3.698
## hormone_sal_end_min_since_midnight     -1.689e-04  8.005e-04  -0.211
## hormone_scr_ert_mean                   -2.675e-03  7.153e-03  -0.374
## lOFC_posvsneg_feedback_z               -3.142e-02  5.123e-01  -0.061
## race.ethnicity.5levelBlack             -6.449e-01  9.086e-01  -0.710
## race.ethnicity.5levelMixed              9.647e-01  8.717e-01   1.107
## race.ethnicity.5levelOther             -4.866e-01  1.051e+00  -0.463
## race.ethnicity.5levelWhite              1.476e+00  8.065e-01   1.830
## demo_race_hispanic1                    -1.525e-01  4.070e-01  -0.375
```

```
## interview_age                                      2.882e-02  1.821e-02   1.582
## MRI_minus_hormone_date_time                        4.158e-05  1.645e-05   2.527
## bmi                                                4.944e-02  3.637e-02   1.359
## household.income[>=200K]                          -2.553e+00  9.756e-01  -2.617
## household.income[100K-200K]                       -1.583e+00  9.047e-01  -1.750
## household.income[12K-16K]                         -3.525e-01  1.137e+00  -0.310
## household.income[16K-25K]                         -1.539e+00  1.038e+00  -1.482
## household.income[25K-35K]                          3.475e-02  9.504e-01   0.037
## household.income[35K-50K]                         -9.941e-01  9.291e-01  -1.070
## household.income[50K-75K]                         -1.369e+00  9.097e-01  -1.505
## household.income[5K-12K]                          -4.506e-01  1.091e+00  -0.413
## household.income[75K-100K]                        -1.316e+00  9.161e-01  -1.437
## high.educBachelor                                  3.302e-01  8.649e-01   0.382
## high.educHS Diploma/GED                            8.826e-02  8.777e-01   0.101
## high.educPost Graduate Degree                      6.831e-01  8.798e-01   0.776
## high.educSome College                              7.253e-01  8.139e-01   0.891
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z      1.689e-03  1.242e-02   0.136
##                                                   Pr(>|t|)
## (Intercept)                                       0.763958
## PDS_score                                         0.000225 ***
## hormone_sal_end_min_since_midnight                0.832970
## hormone_scr_ert_mean                              0.708416
## lOFC_posvsneg_feedback_z                          0.951102
## race.ethnicity.5levelBlack                        0.477979
## race.ethnicity.5levelMixed                        0.268580
## race.ethnicity.5levelOther                        0.643510
## race.ethnicity.5levelWhite                        0.067485 .
## demo_race_hispanic1                               0.707991
## interview_age                                     0.113818
## MRI_minus_hormone_date_time                       0.011583 *
## bmi                                               0.174213
## household.income[>=200K]                          0.008955 **
## household.income[100K-200K]                       0.080275 .
## household.income[12K-16K]                         0.756586
## household.income[16K-25K]                         0.138410
## household.income[25K-35K]                         0.970841
## household.income[35K-50K]                         0.284830
## household.income[50K-75K]                         0.132528
## household.income[5K-12K]                          0.679537
## household.income[75K-100K]                        0.150905
## high.educBachelor                                 0.702729
## high.educHS Diploma/GED                           0.919908
## high.educPost Graduate Degree                     0.437585
## high.educSome College                             0.372976
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z     0.891894
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0267
## lmer.REML =  10379  Scale est. = 16.178    n = 1688
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * lOFC_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                              Estimate Std. Error t value
## (Intercept)                                 2.925e+00  2.693e+00   1.086
## PDS_score                                   6.832e-01  2.790e-01   2.449
## hormone_sal_end_min_since_midnight          6.360e-04  8.105e-04   0.785
## hormone_scr_ert_mean                        7.309e-04  7.634e-03   0.096
## lOFC_posvsneg_feedback_z                    1.120e-01  5.279e-01   0.212
## race.ethnicity.5levelBlack                  2.173e-02  1.144e+00   0.019
## race.ethnicity.5levelMixed                  1.242e+00  1.114e+00   1.115
## race.ethnicity.5levelOther                  3.786e-01  1.246e+00   0.304
## race.ethnicity.5levelWhite                  1.410e+00  1.054e+00   1.338
## demo_race_hispanic1                         5.439e-02  4.246e-01   0.128
## interview_age                               3.336e-03  1.753e-02   0.190
## MRI_minus_hormone_date_time                 2.225e-05  1.825e-05   1.219
## bmi                                         1.891e-02  3.778e-02   0.501
## household.income[>=200K]                   -2.863e+00  1.069e+00  -2.679
## household.income[100K-200K]                -2.461e+00  1.015e+00  -2.424
## household.income[12K-16K]                  -3.755e-01  1.287e+00  -0.292
## household.income[16K-25K]                   7.651e-01  1.118e+00   0.684
## household.income[25K-35K]                  -8.363e-01  1.095e+00  -0.764
## household.income[35K-50K]                  -6.359e-01  1.057e+00  -0.601
## household.income[50K-75K]                  -1.836e+00  1.014e+00  -1.810
## household.income[5K-12K]                    3.964e-01  1.147e+00   0.345
## household.income[75K-100K]                 -2.525e+00  1.032e+00  -2.447
## high.educBachelor                           1.168e+00  9.672e-01   1.208
## high.educHS Diploma/GED                    -9.123e-01  9.968e-01  -0.915
## high.educPost Graduate Degree               3.476e-01  9.696e-01   0.358
## high.educSome College                       7.412e-01  9.240e-01   0.802
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z -1.145e-03  1.468e-02  -0.078
##                                             Pr(>|t|)
## (Intercept)                                  0.27748
## PDS_score                                    0.01444 *
## hormone_sal_end_min_since_midnight           0.43279
## hormone_scr_ert_mean                         0.92374
## lOFC_posvsneg_feedback_z                     0.83205
## race.ethnicity.5levelBlack                   0.98485
## race.ethnicity.5levelMixed                   0.26516
## race.ethnicity.5levelOther                   0.76128
## race.ethnicity.5levelWhite                   0.18099
```

```
## demo_race_hispanic1                              0.89810
## interview_age                                    0.84907
## MRI_minus_hormone_date_time                      0.22297
## bmi                                              0.61667
## household.income[>=200K]                         0.00745 **
## household.income[100K-200K]                      0.01545 *
## household.income[12K-16K]                        0.77057
## household.income[16K-25K]                        0.49404
## household.income[25K-35K]                        0.44515
## household.income[35K-50K]                        0.54765
## household.income[50K-75K]                        0.07044 .
## household.income[5K-12K]                         0.72981
## household.income[75K-100K]                       0.01451 *
## high.educBachelor                                0.22726
## high.educHS Diploma/GED                          0.36023
## high.educPost Graduate Degree                    0.72003
## high.educSome College                            0.42253
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z  0.93784
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0325
## lmer.REML =  10415  Scale est. = 13.448    n = 1678
```

4.23 Model: CBCL internalizing factor ~ Testosterone x Medial OFC activity (feedback stage) + PDS

Female participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * mOFC_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                           Estimate Std. Error t value
## (Intercept)                             -7.155e-01  2.594e+00  -0.276
## PDS_score                                7.882e-01  2.043e-01   3.859
## hormone_sal_end_min_since_midnight      -9.504e-05  7.994e-04  -0.119
## hormone_scr_ert_mean                    -2.973e-03  7.143e-03  -0.416
## mOFC_posvsneg_feedback_z                 2.979e-01  4.781e-01   0.623
## race.ethnicity.5levelBlack              -6.171e-01  9.085e-01  -0.679
## race.ethnicity.5levelMixed               9.949e-01  8.717e-01   1.141
## race.ethnicity.5levelOther              -4.683e-01  1.052e+00  -0.445
```

```
## race.ethnicity.5levelWhite                      1.510e+00  8.069e-01   1.871
## demo_race_hispanic1                             -1.627e-01  4.060e-01  -0.401
## interview_age                                    2.675e-02  1.816e-02   1.473
## MRI_minus_hormone_date_time                      4.075e-05  1.643e-05   2.481
## bmi                                              5.246e-02  3.629e-02   1.445
## household.income[>=200K]                        -2.525e+00  9.754e-01  -2.589
## household.income[100K-200K]                     -1.530e+00  9.043e-01  -1.692
## household.income[12K-16K]                       -3.194e-01  1.135e+00  -0.281
## household.income[16K-25K]                       -1.541e+00  1.040e+00  -1.482
## household.income[25K-35K]                        4.362e-02  9.497e-01   0.046
## household.income[35K-50K]                       -1.024e+00  9.280e-01  -1.103
## household.income[50K-75K]                       -1.343e+00  9.090e-01  -1.477
## household.income[5K-12K]                        -4.451e-01  1.090e+00  -0.408
## household.income[75K-100K]                      -1.303e+00  9.162e-01  -1.422
## high.educBachelor                                3.079e-01  8.643e-01   0.356
## high.educHS Diploma/GED                          5.897e-02  8.771e-01   0.067
## high.educPost Graduate Degree                    6.668e-01  8.793e-01   0.758
## high.educSome College                            7.269e-01  8.136e-01   0.893
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z -1.304e-03  1.226e-02  -0.106
##                                                 Pr(>|t|)
## (Intercept)                                     0.782726
## PDS_score                                       0.000118 ***
## hormone_sal_end_min_since_midnight              0.905382
## hormone_scr_ert_mean                            0.677358
## mOFC_posvsneg_feedback_z                        0.533286
## race.ethnicity.5levelBlack                      0.497072
## race.ethnicity.5levelMixed                      0.253873
## race.ethnicity.5levelOther                      0.656164
## race.ethnicity.5levelWhite                      0.061453 .
## demo_race_hispanic1                             0.688683
## interview_age                                   0.140808
## MRI_minus_hormone_date_time                     0.013204 *
## bmi                                             0.148557
## household.income[>=200K]                        0.009722 **
## household.income[100K-200K]                     0.090863 .
## household.income[12K-16K]                       0.778473
## household.income[16K-25K]                       0.138461
## household.income[25K-35K]                       0.963374
## household.income[35K-50K]                       0.270202
## household.income[50K-75K]                       0.139773
## household.income[5K-12K]                        0.683182
## household.income[75K-100K]                      0.155266
## high.educBachelor                               0.721750
## high.educHS Diploma/GED                         0.946402
## high.educPost Graduate Degree                   0.448349
## high.educSome College                           0.371735
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z 0.915329
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0283
## lmer.REML =  10410  Scale est. = 16        n = 1693
```

Male participants

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * mOFC_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                             Estimate Std. Error t value
## (Intercept)                                2.806e+00  2.682e+00   1.046
## PDS_score                                  6.878e-01  2.780e-01   2.474
## hormone_sal_end_min_since_midnight         6.420e-04  8.076e-04   0.795
## hormone_scr_ert_mean                       7.218e-04  7.624e-03   0.095
## mOFC_posvsneg_feedback_z                  -4.108e-01  4.322e-01  -0.950
## race.ethnicity.5levelBlack                -5.486e-02  1.141e+00  -0.048
## race.ethnicity.5levelMixed                 1.247e+00  1.111e+00   1.122
## race.ethnicity.5levelOther                 3.794e-01  1.242e+00   0.306
## race.ethnicity.5levelWhite                 1.404e+00  1.051e+00   1.336
## demo_race_hispanic1                        3.313e-02  4.214e-01   0.079
## interview_age                              4.634e-03  1.747e-02   0.265
## MRI_minus_hormone_date_time                2.206e-05  1.872e-05   1.178
## bmi                                        2.059e-02  3.760e-02   0.548
## household.income[>=200K]                  -2.931e+00  1.059e+00  -2.767
## household.income[100K-200K]               -2.516e+00  1.005e+00  -2.502
## household.income[12K-16K]                 -3.255e-01  1.269e+00  -0.257
## household.income[16K-25K]                  6.944e-01  1.097e+00   0.633
## household.income[25K-35K]                 -8.917e-01  1.086e+00  -0.821
## household.income[35K-50K]                 -6.756e-01  1.048e+00  -0.645
## household.income[50K-75K]                 -1.870e+00  1.003e+00  -1.864
## household.income[5K-12K]                   3.505e-01  1.138e+00   0.308
## household.income[75K-100K]                -2.571e+00  1.022e+00  -2.515
## high.educBachelor                          1.150e+00  9.567e-01   1.202
## high.educHS Diploma/GED                   -9.435e-01  9.848e-01  -0.958
## high.educPost Graduate Degree              3.498e-01  9.593e-01   0.365
## high.educSome College                      7.338e-01  9.126e-01   0.804
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z  9.152e-03  1.197e-02   0.764
##                                            Pr(>|t|)
## (Intercept)                                 0.29555
## PDS_score                                   0.01347 *
## hormone_sal_end_min_since_midnight          0.42671
## hormone_scr_ert_mean                        0.92458
## mOFC_posvsneg_feedback_z                    0.34204
## race.ethnicity.5levelBlack                  0.96164
## race.ethnicity.5levelMixed                  0.26194
## race.ethnicity.5levelOther                  0.75999
## race.ethnicity.5levelWhite                  0.18179
```

```
## demo_race_hispanic1                              0.93735
## interview_age                                    0.79089
## MRI_minus_hormone_date_time                      0.23878
## bmi                                              0.58403
## household.income[>=200K]                         0.00572 **
## household.income[100K-200K]                      0.01244 *
## household.income[12K-16K]                        0.79758
## household.income[16K-25K]                        0.52698
## household.income[25K-35K]                        0.41167
## household.income[35K-50K]                        0.51923
## household.income[50K-75K]                        0.06248 .
## household.income[5K-12K]                         0.75815
## household.income[75K-100K]                       0.01199 *
## high.educBachelor                                0.22943
## high.educHS Diploma/GED                          0.33819
## high.educPost Graduate Degree                    0.71545
## high.educSome College                            0.42150
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z  0.44475
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0331
## lmer.REML =  10448  Scale est. = 13.458    n = 1684
```

4.24 Model: CBCL internalizing factor ~ Testosterone x BIS-BAS RR + PDS

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * bisbas_ss_basm_rr + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         -1.8308109  2.4389443  -0.751 0.452940
## PDS_score                            0.6918743  0.1784870   3.876 0.000109
## hormone_sal_end_min_since_midnight   0.0004665  0.0006983   0.668 0.504158
## hormone_scr_ert_mean                 0.0224479  0.0224797   0.999 0.318108
## bisbas_ss_basm_rr                    0.0738759  0.1015582   0.727 0.467044
## race.ethnicity.5levelBlack          -0.8173107  0.8130936  -1.005 0.314918
## race.ethnicity.5levelMixed           1.0263881  0.7903367   1.299 0.194193
## race.ethnicity.5levelOther          -0.4166465  0.9279798  -0.449 0.653489
## race.ethnicity.5levelWhite           1.1114718  0.7339106   1.514 0.130056
## demo_race_hispanic1                  0.0078376  0.3598907   0.022 0.982627
## interview_age                        0.0293286  0.0161038   1.821 0.068710
## bmi                                  0.0438535  0.0320512   1.368 0.171380
```

```
## household.income[>=200K]               -2.7862299  0.8564336  -3.253 0.001158
## household.income[100K-200K]            -1.9025637  0.7930809  -2.399 0.016525
## household.income[12K-16K]              -0.4001558  1.0278711  -0.389 0.697088
## household.income[16K-25K]              -1.4272274  0.8829785  -1.616 0.106157
## household.income[25K-35K]              -0.4127121  0.8299687  -0.497 0.619054
## household.income[35K-50K]              -1.3981410  0.8076142  -1.731 0.083557
## household.income[50K-75K]              -1.5043130  0.7910864  -1.902 0.057357
## household.income[5K-12K]               -0.3987567  0.8993055  -0.443 0.657516
## household.income[75K-100K]             -1.6252823  0.8047398  -2.020 0.043543
## high.educBachelor                       1.2302069  0.7491345   1.642 0.100698
## high.educHS Diploma/GED                 1.1812338  0.7521009   1.571 0.116425
## high.educPost Graduate Degree           1.6175351  0.7633469   2.119 0.034202
## high.educSome College                   1.4661799  0.6995451   2.096 0.036205
## hormone_scr_ert_mean:bisbas_ss_basm_rr -0.0032566  0.0025299  -1.287 0.198147
##
## (Intercept)
## PDS_score                              ***
## hormone_sal_end_min_since_midnight
## hormone_scr_ert_mean
## bisbas_ss_basm_rr
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed
## race.ethnicity.5levelOther
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age                          .
## bmi
## household.income[>=200K]               **
## household.income[100K-200K]            *
## household.income[12K-16K]
## household.income[16K-25K]
## household.income[25K-35K]
## household.income[35K-50K]              .
## household.income[50K-75K]              .
## household.income[5K-12K]
## household.income[75K-100K]             *
## high.educBachelor
## high.educHS Diploma/GED
## high.educPost Graduate Degree          *
## high.educSome College                  *
## hormone_scr_ert_mean:bisbas_ss_basm_rr
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0246
## lmer.REML =  13661  Scale est. = 17.45     n = 2216
```

Male participants

```
##
## Family: gaussian
## Link function: identity
```

```
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * bisbas_ss_basm_rr + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)                             3.0214961  2.4188825   1.249 0.211742
## PDS_score                               0.5982085  0.2206512   2.711 0.006754
## hormone_sal_end_min_since_midnight      0.0011800  0.0006792   1.737 0.082449
## hormone_scr_ert_mean                    0.0232126  0.0265444   0.874 0.381944
## bisbas_ss_basm_rr                      -0.0214867  0.1055663  -0.204 0.838732
## race.ethnicity.5levelBlack             -0.7158849  0.8996073  -0.796 0.426243
## race.ethnicity.5levelMixed              1.0311515  0.8752932   1.178 0.238890
## race.ethnicity.5levelOther              0.0975950  0.9939715   0.098 0.921792
## race.ethnicity.5levelWhite              0.9770239  0.8241939   1.185 0.235967
## demo_race_hispanic1                    -0.0596473  0.3566310  -0.167 0.867186
## interview_age                           0.0028672  0.0150096   0.191 0.848523
## bmi                                     0.0323367  0.0311631   1.038 0.299535
## household.income[>=200K]               -3.1179301  0.8503708  -3.667 0.000251
## household.income[100K-200K]            -2.5663877  0.7957168  -3.225 0.001276
## household.income[12K-16K]              -0.1582670  1.0348351  -0.153 0.878459
## household.income[16K-25K]               0.0425295  0.8518852   0.050 0.960187
## household.income[25K-35K]              -0.6811484  0.8523161  -0.799 0.424270
## household.income[35K-50K]              -1.2405739  0.8099194  -1.532 0.125724
## household.income[50K-75K]              -1.6651461  0.7861890  -2.118 0.034279
## household.income[5K-12K]               -0.1326620  0.8783159  -0.151 0.879956
## household.income[75K-100K]             -2.6850576  0.8104833  -3.313 0.000937
## high.educBachelor                       1.2899938  0.7937777   1.625 0.104268
## high.educHS Diploma/GED                -0.7530014  0.7855727  -0.959 0.337889
## high.educPost Graduate Degree           0.5339014  0.7974980   0.669 0.503261
## high.educSome College                   0.8929213  0.7556357   1.182 0.237451
## hormone_scr_ert_mean:bisbas_ss_basm_rr -0.0020555  0.0029379  -0.700 0.484201
##
## (Intercept)
## PDS_score                              **
## hormone_sal_end_min_since_midnight     .
## hormone_scr_ert_mean
## bisbas_ss_basm_rr
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed
## race.ethnicity.5levelOther
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## bmi
## household.income[>=200K]               ***
## household.income[100K-200K]            **
## household.income[12K-16K]
## household.income[16K-25K]
## household.income[25K-35K]
## household.income[35K-50K]
```

```
## household.income[50K-75K]              *
## household.income[5K-12K]
## household.income[75K-100K]             ***
## high.educBachelor
## high.educHS Diploma/GED
## high.educPost Graduate Degree
## high.educSome College
## hormone_scr_ert_mean:bisbas_ss_basm_rr
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.035
## lmer.REML =  14855  Scale est. = 15.901    n = 2391
```

4.25 Model: CBCL internalizing factor ~ Testosterone x MID Reaction Time + PDS (large reward vs. neutral)

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * rt_diff_large_neutral_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                           Estimate Std. Error t value
## (Intercept)                             -5.783e-01  2.466e+00  -0.235
## PDS_score                                8.814e-01  1.970e-01   4.475
## hormone_sal_end_min_since_midnight      -8.294e-05  7.543e-04  -0.110
## hormone_scr_ert_mean                    -5.461e-03  6.967e-03  -0.784
## rt_diff_large_neutral_z                 -8.889e-02  2.935e-01  -0.303
## race.ethnicity.5levelBlack              -1.091e+00  8.679e-01  -1.258
## race.ethnicity.5levelMixed               5.667e-01  8.368e-01   0.677
## race.ethnicity.5levelOther              -6.539e-01  9.808e-01  -0.667
## race.ethnicity.5levelWhite               1.132e+00  7.757e-01   1.459
## demo_race_hispanic1                     -8.035e-02  3.880e-01  -0.207
## interview_age                            2.880e-02  1.748e-02   1.648
## bmi                                      3.661e-02  3.440e-02   1.064
## household.income[>=200K]                -2.297e+00  9.330e-01  -2.462
## household.income[100K-200K]             -1.399e+00  8.661e-01  -1.615
## household.income[12K-16K]               -2.543e-01  1.110e+00  -0.229
## household.income[16K-25K]               -1.227e+00  9.698e-01  -1.265
## household.income[25K-35K]                2.614e-01  9.061e-01   0.289
## household.income[35K-50K]               -8.242e-01  8.804e-01  -0.936
## household.income[50K-75K]               -1.210e+00  8.659e-01  -1.397
## household.income[5K-12K]                 2.031e-01  1.033e+00   0.196
## household.income[75K-100K]              -1.204e+00  8.801e-01  -1.368
```

```
## high.educBachelor                                3.996e-01  8.151e-01   0.490
## high.educHS Diploma/GED                          4.214e-01  8.269e-01   0.510
## high.educPost Graduate Degree                    8.394e-01  8.303e-01   1.011
## high.educSome College                            9.446e-01  7.657e-01   1.234
## hormone_scr_ert_mean:rt_diff_large_neutral_z     7.887e-03  7.334e-03   1.075
##                                                 Pr(>|t|)
## (Intercept)                                       0.8146
## PDS_score                                       8.11e-06 ***
## hormone_sal_end_min_since_midnight                0.9125
## hormone_scr_ert_mean                              0.4333
## rt_diff_large_neutral_z                           0.7620
## race.ethnicity.5levelBlack                        0.2087
## race.ethnicity.5levelMixed                        0.4984
## race.ethnicity.5levelOther                        0.5050
## race.ethnicity.5levelWhite                        0.1446
## demo_race_hispanic1                               0.8360
## interview_age                                     0.0995 .
## bmi                                               0.2873
## household.income[>=200K]                          0.0139 *
## household.income[100K-200K]                       0.1064
## household.income[12K-16K]                         0.8188
## household.income[16K-25K]                         0.2061
## household.income[25K-35K]                         0.7730
## household.income[35K-50K]                         0.3493
## household.income[50K-75K]                         0.1625
## household.income[5K-12K]                          0.8442
## household.income[75K-100K]                        0.1716
## high.educBachelor                                 0.6241
## high.educHS Diploma/GED                           0.6104
## high.educPost Graduate Degree                     0.3122
## high.educSome College                             0.2175
## hormone_scr_ert_mean:rt_diff_large_neutral_z      0.2824
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0302
## lmer.REML =  11478  Scale est. = 16.54     n = 1867
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * rt_diff_large_neutral_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                             Estimate Std. Error t value
```

```
## (Intercept)                                 1.2079430  2.5356216   0.476
## PDS_score                                   0.7726076  0.2528294   3.056
## hormone_sal_end_min_since_midnight          0.0012042  0.0007489   1.608
## hormone_scr_ert_mean                        0.0035338  0.0072899   0.485
## rt_diff_large_neutral_z                    -0.1933502  0.2892424  -0.668
## race.ethnicity.5levelBlack                 -0.6974965  1.0918154  -0.639
## race.ethnicity.5levelMixed                  0.7108551  1.0668086   0.666
## race.ethnicity.5levelOther                 -0.1171684  1.1827097  -0.099
## race.ethnicity.5levelWhite                  0.8594635  1.0102058   0.851
## demo_race_hispanic1                        -0.0165276  0.3962907  -0.042
## interview_age                               0.0051666  0.0164938   0.313
## bmi                                         0.0284580  0.0352814   0.807
## household.income[>=200K]                   -1.9490655  0.9722481  -2.005
## household.income[100K-200K]                -1.5972310  0.9183431  -1.739
## household.income[12K-16K]                   1.0729800  1.1635366   0.922
## household.income[16K-25K]                   1.5626059  1.0036772   1.557
## household.income[25K-35K]                   0.3576706  0.9866835   0.362
## household.income[35K-50K]                   0.3402717  0.9391754   0.362
## household.income[50K-75K]                  -0.7860684  0.9114050  -0.862
## household.income[5K-12K]                    0.9176560  1.0345895   0.887
## household.income[75K-100K]                 -1.5718755  0.9340489  -1.683
## high.educBachelor                           1.5318995  0.9097029   1.684
## high.educHS Diploma/GED                    -0.0698078  0.9194642  -0.076
## high.educPost Graduate Degree               0.7954022  0.9107201   0.873
## high.educSome College                       0.9896073  0.8648969   1.144
## hormone_scr_ert_mean:rt_diff_large_neutral_z  0.0046946  0.0079892   0.588
##                                            Pr(>|t|)
## (Intercept)                                 0.63385
## PDS_score                                   0.00228 **
## hormone_sal_end_min_since_midnight          0.10800
## hormone_scr_ert_mean                        0.62791
## rt_diff_large_neutral_z                     0.50391
## race.ethnicity.5levelBlack                  0.52300
## race.ethnicity.5levelMixed                  0.50528
## race.ethnicity.5levelOther                  0.92109
## race.ethnicity.5levelWhite                  0.39500
## demo_race_hispanic1                         0.96674
## interview_age                               0.75413
## bmi                                         0.42000
## household.income[>=200K]                    0.04514 *
## household.income[100K-200K]                 0.08215 .
## household.income[12K-16K]                   0.35656
## household.income[16K-25K]                   0.11967
## household.income[25K-35K]                   0.71702
## household.income[35K-50K]                   0.71716
## household.income[50K-75K]                   0.38853
## household.income[5K-12K]                    0.37520
## household.income[75K-100K]                  0.09257 .
## high.educBachelor                           0.09235 .
## high.educHS Diploma/GED                     0.93949
## high.educPost Graduate Degree               0.38257
## high.educSome College                       0.25269
## hormone_scr_ert_mean:rt_diff_large_neutral_z  0.55686
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0338
## lmer.REML =  11904  Scale est. = 12.654    n = 1920
```

4.26 Model: CBCL internalizing factor ~ Testosterone x MID Reaction Time + PDS (large vs. small reward)

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * rt_diff_large_small_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                           Estimate Std. Error t value
## (Intercept)                             -0.5520425  2.4664193  -0.224
## PDS_score                                0.8933849  0.1969258   4.537
## hormone_sal_end_min_since_midnight      -0.0001280  0.0007541  -0.170
## hormone_scr_ert_mean                    -0.0050999  0.0069590  -0.733
## rt_diff_large_small_z                    0.2350970  0.2721610   0.864
## race.ethnicity.5levelBlack              -1.0517876  0.8684633  -1.211
## race.ethnicity.5levelMixed               0.6125749  0.8374193   0.732
## race.ethnicity.5levelOther              -0.6097658  0.9810845  -0.622
## race.ethnicity.5levelWhite               1.1748308  0.7758337   1.514
## demo_race_hispanic1                     -0.0862368  0.3882809  -0.222
## interview_age                            0.0289652  0.0174693   1.658
## bmi                                      0.0341813  0.0344348   0.993
## household.income[>=200K]                -2.3566422  0.9335397  -2.524
## household.income[100K-200K]             -1.4753589  0.8660071  -1.704
## household.income[12K-16K]               -0.2799346  1.1097057  -0.252
## household.income[16K-25K]               -1.3132975  0.9700996  -1.354
## household.income[25K-35K]                0.2420571  0.9062299   0.267
## household.income[35K-50K]               -0.9046927  0.8806887  -1.027
## household.income[50K-75K]               -1.2846384  0.8662124  -1.483
## household.income[5K-12K]                 0.1584675  1.0341913   0.153
## household.income[75K-100K]              -1.2850186  0.8801519  -1.460
## high.educBachelor                        0.4331076  0.8155276   0.531
## high.educHS Diploma/GED                  0.4294921  0.8275583   0.519
## high.educPost Graduate Degree            0.8788390  0.8318674   1.056
## high.educSome College                    0.9927691  0.7667305   1.295
## hormone_scr_ert_mean:rt_diff_large_small_z -0.0006677  0.0070226  -0.095
##                                          Pr(>|t|)
## (Intercept)                                0.8229
## PDS_score                                6.08e-06 ***
## hormone_sal_end_min_since_midnight         0.8652
```

```
## hormone_scr_ert_mean                          0.4637
## rt_diff_large_small_z                         0.3878
## race.ethnicity.5levelBlack                    0.2260
## race.ethnicity.5levelMixed                    0.4646
## race.ethnicity.5levelOther                    0.5343
## race.ethnicity.5levelWhite                    0.1301
## demo_race_hispanic1                           0.8243
## interview_age                                 0.0975 .
## bmi                                           0.3210
## household.income[>=200K]                      0.0117 *
## household.income[100K-200K]                   0.0886 .
## household.income[12K-16K]                     0.8009
## household.income[16K-25K]                     0.1760
## household.income[25K-35K]                     0.7894
## household.income[35K-50K]                     0.3044
## household.income[50K-75K]                     0.1382
## household.income[5K-12K]                      0.8782
## household.income[75K-100K]                    0.1445
## high.educBachelor                             0.5954
## high.educHS Diploma/GED                       0.6038
## high.educPost Graduate Degree                 0.2909
## high.educSome College                         0.1955
## hormone_scr_ert_mean:rt_diff_large_small_z   0.9243
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0301
## lmer.REML =  11478  Scale est. = 16.499    n = 1867
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * rt_diff_large_small_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                          Estimate Std. Error t value
## (Intercept)                             1.2629944  2.5341263   0.498
## PDS_score                               0.7803009  0.2528177   3.086
## hormone_sal_end_min_since_midnight      0.0011856  0.0007488   1.583
## hormone_scr_ert_mean                    0.0035743  0.0073302   0.488
## rt_diff_large_small_z                   0.1113230  0.2788887   0.399
## race.ethnicity.5levelBlack             -0.6921263  1.0918345  -0.634
## race.ethnicity.5levelMixed              0.7202937  1.0664254   0.675
## race.ethnicity.5levelOther             -0.1087161  1.1829589  -0.092
## race.ethnicity.5levelWhite              0.8803271  1.0095366   0.872
```

```
## demo_race_hispanic1                          -0.0124135  0.3967489  -0.031
## interview_age                                 0.0047951  0.0164824   0.291
## bmi                                           0.0281270  0.0352882   0.797
## household.income[>=200K]                     -1.9812439  0.9720740  -2.038
## household.income[100K-200K]                  -1.6219452  0.9188200  -1.765
## household.income[12K-16K]                     1.0698830  1.1637602   0.919
## household.income[16K-25K]                     1.5191279  1.0059324   1.510
## household.income[25K-35K]                     0.3389505  0.9878259   0.343
## household.income[35K-50K]                     0.2964422  0.9392291   0.316
## household.income[50K-75K]                    -0.8151025  0.9113197  -0.894
## household.income[5K-12K]                      0.9143109  1.0348073   0.884
## household.income[75K-100K]                   -1.6027230  0.9345787  -1.715
## high.educBachelor                             1.5340874  0.9097128   1.686
## high.educHS Diploma/GED                      -0.0447472  0.9185345  -0.049
## high.educPost Graduate Degree                 0.8025344  0.9106402   0.881
## high.educSome College                         0.9996967  0.8646029   1.156
## hormone_scr_ert_mean:rt_diff_large_small_z -0.0037414  0.0076857  -0.487
##                                              Pr(>|t|)
## (Intercept)                                   0.61826
## PDS_score                                     0.00206 **
## hormone_sal_end_min_since_midnight            0.11350
## hormone_scr_ert_mean                          0.62588
## rt_diff_large_small_z                         0.68982
## race.ethnicity.5levelBlack                    0.52622
## race.ethnicity.5levelMixed                    0.49949
## race.ethnicity.5levelOther                    0.92679
## race.ethnicity.5levelWhite                    0.38331
## demo_race_hispanic1                           0.97504
## interview_age                                 0.77114
## bmi                                           0.42551
## household.income[>=200K]                      0.04167 *
## household.income[100K-200K]                   0.07768 .
## household.income[12K-16K]                     0.35804
## household.income[16K-25K]                     0.13117
## household.income[25K-35K]                     0.73154
## household.income[35K-50K]                     0.75232
## household.income[50K-75K]                     0.37121
## household.income[5K-12K]                      0.37705
## household.income[75K-100K]                    0.08652 .
## high.educBachelor                             0.09189 .
## high.educHS Diploma/GED                       0.96115
## high.educPost Graduate Degree                 0.37827
## high.educSome College                         0.24772
## hormone_scr_ert_mean:rt_diff_large_small_z    0.62645
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0337
## lmer.REML =  11904  Scale est. = 12.631    n = 1920
```