Supplement C: Testosterone Moodels 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 1

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)                       1.6120616  2.2405295   0.720  0.47191
## hormone_scr_ert_mean             -0.0024728  0.0067497  -0.366  0.71413
## hormone_sal_end_min_since_midnight -0.0002314  0.0006836  -0.338  0.73502
## race.ethnicity.5levelBlack       -0.6036115  0.8721010  -0.692  0.48892
## race.ethnicity.5levelMixed        1.0929743  0.8513287   1.284  0.19933
## race.ethnicity.5levelOther        1.9309205  0.9702969   1.990  0.04671 *
```

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```
## race.ethnicity.5levelWhite              1.3124382  0.8023181   1.636  0.10202
## interview_age                           0.0111139  0.0152823   0.727  0.46716
## bmi                                     0.0963105  0.0302626   3.182  0.00148 **
## household.income[>=200K]               -2.1717697  0.8091248  -2.684  0.00733 **
## household.income[100K-200K]            -1.6083932  0.7534289  -2.135  0.03289 *
## household.income[12K-16K]               0.3386461  1.0107828   0.335  0.73763
## household.income[16K-25K]               0.8269602  0.8465992   0.977  0.32877
## household.income[25K-35K]              -0.3890153  0.7914980  -0.491  0.62313
## household.income[35K-50K]              -0.2280807  0.7629076  -0.299  0.76500
## household.income[50K-75K]              -0.5028157  0.7593142  -0.662  0.50791
## household.income[5K-12K]                0.2904693  0.8839687   0.329  0.74249
## household.income[75K-100K]             -0.9710049  0.7625930  -1.273  0.20305
## high.educBachelor                       0.4088725  0.7541689   0.542  0.58777
## high.educHS Diploma/GED                -0.4501968  0.7545074  -0.597  0.55078
## high.educPost Graduate Degree           0.6105223  0.7612389   0.802  0.42263
## high.educSome College                   0.7030056  0.7097645   0.990  0.32205
## demo_race_hispanic1                    -0.2464877  0.3518220  -0.701  0.48362
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0262
## lmer.REML =  13930  Scale est. = 13.577    n = 2257
```

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)                         3.0616438  2.1707644   1.410 0.158549
## hormone_scr_ert_mean                0.0002767  0.0051109   0.054 0.956824
## hormone_sal_end_min_since_midnight  0.0006219  0.0006508   0.956 0.339355
## race.ethnicity.5levelBlack          0.6395585  0.7965711   0.803 0.422117
## race.ethnicity.5levelMixed          1.9950117  0.7776613   2.565 0.010365 *
## race.ethnicity.5levelOther          1.4996305  0.9236994   1.624 0.104611
## race.ethnicity.5levelWhite          1.6818442  0.7240533   2.323 0.020271 *
## interview_age                      -0.0038428  0.0146314  -0.263 0.792849
## bmi                                 0.0804796  0.0312256   2.577 0.010014 *
## household.income[>=200K]           -2.6148059  0.7913911  -3.304 0.000967 ***
## household.income[100K-200K]        -2.5012997  0.7350713  -3.403 0.000678 ***
## household.income[12K-16K]          -0.9229446  0.9886978  -0.933 0.350657
## household.income[16K-25K]          -0.2212527  0.8153974  -0.271 0.786150
## household.income[25K-35K]          -1.1740355  0.7974127  -1.472 0.141067
## household.income[35K-50K]          -0.8784877  0.7652501  -1.148 0.251092
## household.income[50K-75K]          -1.5730499  0.7336202  -2.144 0.032113 *
```

```
## household.income[5K-12K]                  0.7960291  0.8578664    0.928 0.353542
## household.income[75K-100K]               -2.1381126  0.7473256   -2.861 0.004259 **
## high.educBachelor                         0.8832514  0.7243460    1.219 0.222819
## high.educHS Diploma/GED                  -0.1257010  0.7330734   -0.171 0.863868
## high.educPost Graduate Degree             0.7538440  0.7350181    1.026 0.305176
## high.educSome College                     0.9611070  0.6886472    1.396 0.162948
## demo_race_hispanic1                      -0.4449962  0.3324322   -1.339 0.180823
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0206
## lmer.REML =  15225  Scale est. = 13.729    n = 2463
```

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)                         1.0915317  1.2855741   0.849   0.3959
## hormone_scr_ert_mean                0.0006783  0.0038754   0.175   0.8611
## hormone_sal_end_min_since_midnight -0.0002621  0.0003914  -0.670   0.5031
## race.ethnicity.5levelBlack         -0.2293040  0.4980515  -0.460   0.6453
## race.ethnicity.5levelMixed          0.5505545  0.4862818   1.132   0.2577
## race.ethnicity.5levelOther          0.7729731  0.5547241   1.393   0.1636
## race.ethnicity.5levelWhite          0.7856258  0.4582490   1.714   0.0866 .
## interview_age                       0.0040207  0.0087875   0.458   0.6473
## bmi                                 0.0254984  0.0173614   1.469   0.1421
## household.income[>=200K]           -1.1324484  0.4622601  -2.450   0.0144 *
## household.income[100K-200K]        -0.6242904  0.4306495  -1.450   0.1473
## household.income[12K-16K]           0.1460299  0.5780393   0.253   0.8006
## household.income[16K-25K]           0.5777438  0.4842485   1.193   0.2330
## household.income[25K-35K]          -0.0354609  0.4527126  -0.078   0.9376
## household.income[35K-50K]           0.0813808  0.4361013   0.187   0.8520
## household.income[50K-75K]          -0.0381632  0.4340311  -0.088   0.9299
## household.income[5K-12K]            0.0861162  0.5050909   0.170   0.8646
## household.income[75K-100K]         -0.3554195  0.4358402  -0.815   0.4149
## high.educBachelor                   0.2992076  0.4313293   0.694   0.4880
## high.educHS Diploma/GED            -0.2422344  0.4320133  -0.561   0.5751
## high.educPost Graduate Degree       0.6340948  0.4353527   1.457   0.1454
## high.educSome College               0.4566859  0.4060047   1.125   0.2608
## demo_race_hispanic1                -0.1033314  0.2007828  -0.515   0.6069
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0187
## lmer.REML =  11449  Scale est. = 5.1695    n = 2257
```

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)                        1.910e+00  1.226e+00   1.558  0.11941
## hormone_scr_ert_mean              -6.759e-04  2.881e-03  -0.235  0.81457
## hormone_sal_end_min_since_midnight 3.759e-06  3.689e-04   0.010  0.99187
## race.ethnicity.5levelBlack         5.354e-01  4.492e-01   1.192  0.23342
## race.ethnicity.5levelMixed         1.183e+00  4.390e-01   2.695  0.00708 **
## race.ethnicity.5levelOther         1.011e+00  5.198e-01   1.945  0.05186 .
## race.ethnicity.5levelWhite         1.134e+00  4.090e-01   2.773  0.00559 **
## interview_age                     -4.494e-03  8.272e-03  -0.543  0.58702
## bmi                                2.502e-02  1.761e-02   1.421  0.15546
## household.income[>=200K]          -1.042e+00  4.431e-01  -2.352  0.01874 *
## household.income[100K-200K]       -9.729e-01  4.117e-01  -2.363  0.01821 *
## household.income[12K-16K]         -2.429e-01  5.558e-01  -0.437  0.66215
## household.income[16K-25K]          8.157e-02  4.563e-01   0.179  0.85815
## household.income[25K-35K]         -2.991e-01  4.464e-01  -0.670  0.50293
## household.income[35K-50K]         -2.146e-01  4.287e-01  -0.501  0.61675
## household.income[50K-75K]         -6.885e-01  4.108e-01  -1.676  0.09391 .
## household.income[5K-12K]           1.747e-01  4.812e-01   0.363  0.71670
## household.income[75K-100K]        -8.127e-01  4.185e-01  -1.942  0.05229 .
## high.educBachelor                  4.590e-01  4.055e-01   1.132  0.25778
## high.educHS Diploma/GED           -2.049e-01  4.104e-01  -0.499  0.61770
## high.educPost Graduate Degree      4.347e-01  4.115e-01   1.057  0.29081
## high.educSome College              3.476e-01  3.857e-01   0.901  0.36754
## demo_race_hispanic1               -9.839e-02  1.868e-01  -0.527  0.59849
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00807
## lmer.REML =  12445  Scale est. = 6.1054    n = 2463
```

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)                      3.899e-01  6.270e-01   0.622  0.53406
## hormone_scr_ert_mean             3.622e-04  1.893e-03   0.191  0.84825
## hormone_sal_end_min_since_midnight 3.311e-07  1.883e-04   0.002  0.99860
## race.ethnicity.5levelBlack      -4.265e-02  2.412e-01  -0.177  0.85966
## race.ethnicity.5levelMixed       2.203e-01  2.357e-01   0.934  0.35020
## race.ethnicity.5levelOther       3.962e-01  2.696e-01   1.469  0.14185
## race.ethnicity.5levelWhite       2.805e-01  2.218e-01   1.265  0.20596
## interview_age                    1.063e-03  4.300e-03   0.247  0.80472
## bmi                              2.783e-02  8.480e-03   3.281  0.00105 **
## household.income[>=200K]        -6.511e-01  2.247e-01  -2.898  0.00379 **
## household.income[100K-200K]     -5.806e-01  2.096e-01  -2.770  0.00566 **
## household.income[12K-16K]       -1.071e-02  2.818e-01  -0.038  0.96970
## household.income[16K-25K]       -1.060e-02  2.362e-01  -0.045  0.96423
## household.income[25K-35K]       -1.786e-01  2.207e-01  -0.809  0.41851
## household.income[35K-50K]       -2.919e-01  2.125e-01  -1.373  0.16975
## household.income[50K-75K]       -3.157e-01  2.114e-01  -1.493  0.13547
## household.income[5K-12K]         2.544e-01  2.460e-01   1.034  0.30133
## household.income[75K-100K]      -4.709e-01  2.122e-01  -2.219  0.02656 *
## high.educBachelor                2.350e-02  2.101e-01   0.112  0.91092
## high.educHS Diploma/GED         -8.454e-02  2.108e-01  -0.401  0.68846
## high.educPost Graduate Degree    4.384e-04  2.120e-01   0.002  0.99835
## high.educSome College            1.038e-01  1.978e-01   0.525  0.59971
## demo_race_hispanic1             -2.514e-02  9.632e-02  -0.261  0.79409
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0244
## lmer.REML = 8257.8  Scale est. = 1.479    n = 2257
```

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)                     1.019e+00  6.717e-01   1.518 0.129264
## hormone_scr_ert_mean            4.792e-05  1.576e-03   0.030 0.975739
## hormone_sal_end_min_since_midnight -1.817e-05  1.941e-04  -0.094 0.925400
## race.ethnicity.5levelBlack      1.426e-01  2.460e-01   0.580 0.562294
## race.ethnicity.5levelMixed      4.657e-01  2.414e-01   1.929 0.053793 .
## race.ethnicity.5levelOther      2.416e-01  2.855e-01   0.846 0.397491
## race.ethnicity.5levelWhite      3.508e-01  2.238e-01   1.567 0.117165
## interview_age                  -1.522e-03  4.541e-03  -0.335 0.737469
## bmi                             2.477e-02  9.704e-03   2.553 0.010742 *
## household.income[>=200K]       -9.385e-01  2.430e-01  -3.862 0.000115 ***
## household.income[100K-200K]    -9.128e-01  2.265e-01  -4.030 5.74e-05 ***
## household.income[12K-16K]      -4.266e-01  3.066e-01  -1.391 0.164285
## household.income[16K-25K]      -8.398e-02  2.512e-01  -0.334 0.738219
## household.income[25K-35K]      -3.580e-01  2.460e-01  -1.455 0.145703
## household.income[35K-50K]      -3.438e-01  2.363e-01  -1.455 0.145750
## household.income[50K-75K]      -4.646e-01  2.260e-01  -2.056 0.039918 *
## household.income[5K-12K]        3.609e-01  2.652e-01   1.361 0.173711
## household.income[75K-100K]     -7.595e-01  2.304e-01  -3.296 0.000993 ***
## high.educBachelor               1.550e-01  2.221e-01   0.698 0.485401
## high.educHS Diploma/GED         4.397e-02  2.252e-01   0.195 0.845230
## high.educPost Graduate Degree   1.046e-01  2.256e-01   0.464 0.643037
## high.educSome College           2.241e-01  2.116e-01   1.059 0.289744
## demo_race_hispanic1            -2.958e-01  9.850e-02  -3.003 0.002704 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0342
## lmer.REML = 9549.7  Scale est. = 2.1043    n = 2463
```

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)                     3.432e-01  7.525e-01   0.456  0.64834
## hormone_scr_ert_mean           -8.371e-04  2.270e-03  -0.369  0.71236
## hormone_sal_end_min_since_midnight  2.542e-05  2.243e-04   0.113  0.90977
```

```
## race.ethnicity.5levelBlack              -1.727e-02  2.909e-01  -0.059  0.95267
## race.ethnicity.5levelMixed               4.633e-01  2.845e-01   1.629  0.10352
## race.ethnicity.5levelOther               6.968e-01  3.254e-01   2.141  0.03238 *
## race.ethnicity.5levelWhite               5.720e-01  2.672e-01   2.141  0.03240 *
## interview_age                            1.773e-04  5.152e-03   0.034  0.97255
## bmi                                      2.823e-02  1.020e-02   2.768  0.00569 **
## household.income[>=200K]                -7.065e-01  2.716e-01  -2.601  0.00936 **
## household.income[100K-200K]             -5.757e-01  2.534e-01  -2.272  0.02320 *
## household.income[12K-16K]                3.153e-02  3.406e-01   0.093  0.92624
## household.income[16K-25K]                1.158e-01  2.855e-01   0.406  0.68509
## household.income[25K-35K]               -1.277e-01  2.667e-01  -0.479  0.63207
## household.income[35K-50K]               -5.852e-02  2.571e-01  -0.228  0.81995
## household.income[50K-75K]               -1.884e-01  2.557e-01  -0.737  0.46116
## household.income[5K-12K]                 3.357e-02  2.980e-01   0.113  0.91033
## household.income[75K-100K]              -3.254e-01  2.566e-01  -1.268  0.20481
## high.educBachelor                        8.526e-02  2.537e-01   0.336  0.73688
## high.educHS Diploma/GED                 -1.238e-02  2.543e-01  -0.049  0.96119
## high.educPost Graduate Degree            1.280e-01  2.561e-01   0.500  0.61738
## high.educSome College                    1.700e-01  2.389e-01   0.712  0.47676
## demo_race_hispanic1                     -6.237e-02  1.153e-01  -0.541  0.58868
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0221
## lmer.REML = 9076.3  Scale est. = 1.6816    n = 2257
```

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)                       0.7867393  0.8339719    0.943  0.34559
## hormone_scr_ert_mean              0.0002714  0.0019634    0.138  0.89008
## hormone_sal_end_min_since_midnight 0.0001306 0.0002459    0.531  0.59544
## race.ethnicity.5levelBlack        0.2354893  0.3055726    0.771  0.44099
## race.ethnicity.5levelMixed        0.6728100  0.2990227    2.250  0.02454 *
## race.ethnicity.5levelOther        0.4782639  0.3545160    1.349  0.17744
## race.ethnicity.5levelWhite        0.5660236  0.2778732    2.037  0.04176 *
## interview_age                     0.0014482  0.0056319    0.257  0.79710
## bmi                               0.0056693  0.0120212    0.472  0.63725
## household.income[>=200K]         -0.8419345  0.3027920   -2.781  0.00547 **
## household.income[100K-200K]      -0.8173214  0.2816734   -2.902  0.00375 **
## household.income[12K-16K]         0.0576566  0.3799497    0.152  0.87940
## household.income[16K-25K]         0.1765591  0.3124940    0.565  0.57213
```

```
## household.income[25K-35K]             -0.1759368  0.3058155  -0.575  0.56514
## household.income[35K-50K]             -0.0734889  0.2935337  -0.250  0.80233
## household.income[50K-75K]             -0.4592937  0.2811311  -1.634  0.10244
## household.income[5K-12K]               0.5242591  0.3292342   1.592  0.11143
## household.income[75K-100K]            -0.7305730  0.2864509  -2.550  0.01082 *
## high.educBachelor                      0.4124661  0.2769611   1.489  0.13655
## high.educHS Diploma/GED                0.0383090  0.2805722   0.137  0.89141
## high.educPost Graduate Degree          0.2615936  0.2811746   0.930  0.35228
## high.educSome College                  0.2229823  0.2635484   0.846  0.39759
## demo_race_hispanic1                    -0.3261813  0.1251317  -2.607  0.00920 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0179
## lmer.REML =  10576  Scale est. = 2.5218    n = 2463
```

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)                        2.3849731  2.2523486   1.059  0.28977
## hormone_scr_ert_mean              -0.0072480  0.0069331  -1.045  0.29594
## hormone_sal_end_min_since_midnight -0.0002028  0.0006830  -0.297  0.76649
## PDS_score                          0.5277784  0.1795365   2.940  0.00332 **
## race.ethnicity.5levelBlack        -0.8473558  0.8746326  -0.969  0.33274
## race.ethnicity.5levelMixed         0.9756462  0.8508145   1.147  0.25162
## race.ethnicity.5levelOther         1.7537912  0.9704714   1.807  0.07087 .
## race.ethnicity.5levelWhite         1.2413969  0.8014043   1.549  0.12152
## interview_age                      0.0014609  0.0156079   0.094  0.92543
## bmi                                0.0807876  0.0306640   2.635  0.00848 **
## household.income[>=200K]          -2.0972746  0.8080079  -2.596  0.00950 **
## household.income[100K-200K]       -1.5217800  0.7525642  -2.022  0.04328 *
## household.income[12K-16K]          0.3778573  1.0089231   0.375  0.70806
## household.income[16K-25K]          0.8283878  0.8449654   0.980  0.32700
## household.income[25K-35K]         -0.3576827  0.7900541  -0.453  0.65079
## household.income[35K-50K]         -0.1992379  0.7614848  -0.262  0.79362
## household.income[50K-75K]         -0.4494775  0.7580628  -0.593  0.55329
## household.income[5K-12K]           0.2668758  0.8822540   0.302  0.76230
## household.income[75K-100K]        -0.9372513  0.7612223  -1.231  0.21836
## high.educBachelor                  0.3855439  0.7528024   0.512  0.60860
## high.educHS Diploma/GED           -0.5096355  0.7533615  -0.676  0.49880
```

```
## high.educPost Graduate Degree          0.6021663  0.7598244   0.793 0.42815
## high.educSome College                  0.6411348  0.7087379   0.905 0.36577
## demo_race_hispanic1                    -0.2090333  0.3516249  -0.594 0.55225
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0293
## lmer.REML =  13923  Scale est. = 13.62      n = 2257
```

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)                           3.2981817  2.1667982   1.522 0.128102
## hormone_scr_ert_mean                 -0.0013451  0.0051173  -0.263 0.792694
## hormone_sal_end_min_since_midnight    0.0005832  0.0006506   0.896 0.370145
## PDS_score                             0.8121444  0.2178467   3.728 0.000197 ***
## race.ethnicity.5levelBlack            0.4098648  0.7972704   0.514 0.607239
## race.ethnicity.5levelMixed            1.9394196  0.7759413   2.499 0.012504 *
## race.ethnicity.5levelOther            1.4225534  0.9217964   1.543 0.122902
## race.ethnicity.5levelWhite            1.6625413  0.7224992   2.301 0.021470 *
## interview_age                        -0.0123111  0.0147745  -0.833 0.404779
## bmi                                   0.0640630  0.0314619   2.036 0.041837 *
## household.income[>=200K]             -2.3726345  0.7922956  -2.995 0.002775 **
## household.income[100K-200K]          -2.2965578  0.7353954  -3.123 0.001812 **
## household.income[12K-16K]            -0.7536147  0.9872851  -0.763 0.445346
## household.income[16K-25K]             0.0190450  0.8160657   0.023 0.981383
## household.income[25K-35K]            -1.0452526  0.7962188  -1.313 0.189384
## household.income[35K-50K]            -0.6871082  0.7651478  -0.898 0.369270
## household.income[50K-75K]            -1.3776233  0.7337994  -1.877 0.060585 .
## household.income[5K-12K]              0.9469686  0.8567751   1.105 0.269151
## household.income[75K-100K]           -1.9176272  0.7479384  -2.564 0.010410 *
## high.educBachelor                     0.8178685  0.7229754   1.131 0.258060
## high.educHS Diploma/GED              -0.2519034  0.7321384  -0.344 0.730827
## high.educPost Graduate Degree         0.6786065  0.7336440   0.925 0.355068
## high.educSome College                 0.8645836  0.6875566   1.257 0.208703
## demo_race_hispanic1                  -0.4617699  0.3323717  -1.389 0.164863
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0249
## lmer.REML =  15213  Scale est. = 13.526     n = 2463
```

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)                         2.9130028  2.3233291   1.254  0.21004
## hormone_scr_ert_mean               -0.0043560  0.0068699  -0.634  0.52610
## hormone_sal_end_min_since_midnight -0.0002944  0.0006838  -0.430  0.66688
## pds_p_ss_categoryEarly              0.8530436  0.3107091   2.745  0.00609 **
## pds_p_ss_categoryLate               0.6289272  0.7852569   0.801  0.42326
## pds_p_ss_categoryMid                0.8353742  0.3145314   2.656  0.00797 **
## race.ethnicity.5levelBlack         -0.6929110  0.8745294  -0.792  0.42826
## race.ethnicity.5levelMixed          1.0674042  0.8512557   1.254  0.21000
## race.ethnicity.5levelOther          1.8920193  0.9698718   1.951  0.05121 .
## race.ethnicity.5levelWhite          1.3136759  0.8018803   1.638  0.10151
## interview_age                       0.0007031  0.0159111   0.044  0.96476
## bmi                                 0.0696107  0.0318289   2.187  0.02884 *
## household.income[>=200K]           -2.1356351  0.8084772  -2.642  0.00831 **
## household.income[100K-200K]        -1.6226379  0.7528361  -2.155  0.03124 *
## household.income[12K-16K]           0.2925047  1.0101851   0.290  0.77218
## household.income[16K-25K]           0.7173974  0.8462362   0.848  0.39667
## household.income[25K-35K]          -0.4632761  0.7909074  -0.586  0.55810
## household.income[35K-50K]          -0.3209262  0.7625588  -0.421  0.67390
## household.income[50K-75K]          -0.5315424  0.7585077  -0.701  0.48352
## household.income[5K-12K]            0.2693149  0.8837212   0.305  0.76058
## household.income[75K-100K]         -1.0093036  0.7618340  -1.325  0.18536
## high.educBachelor                   0.4151960  0.7538851   0.551  0.58187
## high.educHS Diploma/GED            -0.4170856  0.7537675  -0.553  0.58009
## high.educPost Graduate Degree       0.6362550  0.7610128   0.836  0.40321
## high.educSome College               0.7048327  0.7090978   0.994  0.32034
## demo_race_hispanic1                -0.2197306  0.3528992  -0.623  0.53358
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0281
## lmer.REML =  13920  Scale est. = 13.422    n = 2257
```

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)                       3.7450550  2.1803540   1.718  0.08599 .
## hormone_scr_ert_mean             -0.0006196  0.0051143  -0.121  0.90358
## hormone_sal_end_min_since_midnight  0.0006021  0.0006510   0.925  0.35512
## pds_p_ss_categoryEarly            0.7250431  0.2623690   2.763  0.00576 **
## pds_p_ss_categoryLate             1.1862610  1.6888382   0.702  0.48249
## pds_p_ss_categoryMid              0.8721635  0.5429882   1.606  0.10835
## race.ethnicity.5levelBlack        0.4550405  0.7986695   0.570  0.56890
## race.ethnicity.5levelMixed        1.9807946  0.7769717   2.549  0.01085 *
## race.ethnicity.5levelOther        1.4818217  0.9233870   1.605  0.10867
## race.ethnicity.5levelWhite        1.7068173  0.7234527   2.359  0.01839 *
## interview_age                    -0.0105327  0.0147857  -0.712  0.47631
## bmi                               0.0735451  0.0312839   2.351  0.01881 *
## household.income[>=200K]         -2.4827517  0.7921304  -3.134  0.00174 **
## household.income[100K-200K]      -2.3889126  0.7358699  -3.246  0.00118 **
## household.income[12K-16K]        -0.8102729  0.9884576  -0.820  0.41245
## household.income[16K-25K]        -0.0900335  0.8164831  -0.110  0.91220
## household.income[25K-35K]        -1.1264064  0.7970549  -1.413  0.15772
## household.income[35K-50K]        -0.7612534  0.7661346  -0.994  0.32050
## household.income[50K-75K]        -1.4605294  0.7342059  -1.989  0.04678 *
## household.income[5K-12K]          0.8152540  0.8571533   0.951  0.34164
## household.income[75K-100K]       -2.0133297  0.7481895  -2.691  0.00717 **
## high.educBachelor                 0.8560740  0.7251840   1.180  0.23792
## high.educHS Diploma/GED          -0.1580748  0.7337322  -0.215  0.82944
## high.educPost Graduate Degree     0.7349933  0.7358101   0.999  0.31795
## high.educSome College             0.9255923  0.6896899   1.342  0.17971
## demo_race_hispanic1              -0.5028655  0.3330315  -1.510  0.13118
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.023
## lmer.REML =  15214  Scale est. = 13.798    n = 2463
```

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)                          1.3338531  1.2938522   1.031   0.3027
## hormone_scr_ert_mean                -0.0008455  0.0039874  -0.212   0.8321
## hormone_sal_end_min_since_midnight -0.0002534  0.0003914  -0.648   0.5174
## PDS_score                            0.1669514  0.1031628   1.618   0.1057
## race.ethnicity.5levelBlack          -0.3064905  0.5001979  -0.613   0.5401
## race.ethnicity.5levelMixed           0.5139224  0.4866413   1.056   0.2911
## race.ethnicity.5levelOther           0.7165922  0.5556139   1.290   0.1973
## race.ethnicity.5levelWhite           0.7634012  0.4583128   1.666   0.0959 .
## interview_age                        0.0009908  0.0089820   0.110   0.9122
## bmi                                  0.0205792  0.0176161   1.168   0.2429
## household.income[>=200K]            -1.1091095  0.4622750  -2.399   0.0165 *
## household.income[100K-200K]         -0.5971794  0.4307722  -1.386   0.1658
## household.income[12K-16K]            0.1582639  0.5778154   0.274   0.7842
## household.income[16K-25K]            0.5784135  0.4840208   1.195   0.2322
## household.income[25K-35K]           -0.0257929  0.4525398  -0.057   0.9546
## household.income[35K-50K]            0.0905335  0.4359269   0.208   0.8355
## household.income[50K-75K]           -0.0216196  0.4339443  -0.050   0.9603
## household.income[5K-12K]             0.0784624  0.5048613   0.155   0.8765
## household.income[75K-100K]          -0.3448767  0.4356853  -0.792   0.4287
## high.educBachelor                    0.2923270  0.4311570   0.678   0.4978
## high.educHS Diploma/GED             -0.2604124  0.4319643  -0.603   0.5467
## high.educPost Graduate Degree        0.6319203  0.4351604   1.452   0.1466
## high.educSome College                0.4374635  0.4059938   1.078   0.2814
## demo_race_hispanic1                 -0.0917267  0.2008802  -0.457   0.6480
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0193
## lmer.REML =  11449  Scale est. = 5.1832    n = 2257
```

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)                          2.056e+00  1.224e+00   1.681 0.092952 .
## hormone_scr_ert_mean                -1.608e-03  2.885e-03  -0.557 0.577420
## hormone_sal_end_min_since_midnight -1.924e-05  3.687e-04  -0.052 0.958393
## PDS_score                            4.714e-01  1.230e-01   3.834 0.000129 ***
## race.ethnicity.5levelBlack           4.003e-01  4.496e-01   0.890 0.373303
## race.ethnicity.5levelMixed           1.150e+00  4.380e-01   2.625 0.008727 **
```

```
## race.ethnicity.5levelOther               9.659e-01  5.186e-01   1.862 0.062666 .
## race.ethnicity.5levelWhite               1.122e+00  4.081e-01   2.749 0.006015 **
## interview_age                           -9.476e-03  8.355e-03  -1.134 0.256823
## bmi                                      1.546e-02  1.774e-02   0.872 0.383512
## household.income[>=200K]                -9.016e-01  4.435e-01  -2.033 0.042177 *
## household.income[100K-200K]             -8.540e-01  4.118e-01  -2.074 0.038216 *
## household.income[12K-16K]               -1.386e-01  5.550e-01  -0.250 0.802809
## household.income[16K-25K]                2.222e-01  4.566e-01   0.486 0.626670
## household.income[25K-35K]               -2.263e-01  4.456e-01  -0.508 0.611564
## household.income[35K-50K]               -1.024e-01  4.286e-01  -0.239 0.811166
## household.income[50K-75K]               -5.755e-01  4.108e-01  -1.401 0.161389
## household.income[5K-12K]                 2.607e-01  4.805e-01   0.543 0.587447
## household.income[75K-100K]              -6.852e-01  4.188e-01  -1.636 0.101930
## high.educBachelor                        4.200e-01  4.047e-01   1.038 0.299379
## high.educHS Diploma/GED                 -2.773e-01  4.098e-01  -0.677 0.498713
## high.educPost Graduate Degree            3.901e-01  4.106e-01   0.950 0.342239
## high.educSome College                    2.909e-01  3.850e-01   0.756 0.449910
## demo_race_hispanic1                     -1.081e-01  1.868e-01  -0.579 0.562812
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0128
## lmer.REML =  12433  Scale est. = 6.0259    n = 2463
```

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)                       1.3976675  1.3342087   1.048   0.2950
## hormone_scr_ert_mean              0.0005304  0.0039493   0.134   0.8932
## hormone_sal_end_min_since_midnight -0.0002822  0.0003916  -0.721   0.4712
## pds_p_ss_categoryEarly            0.4284597  0.1788420   2.396   0.0167 *
## pds_p_ss_categoryLate             0.0286476  0.4524355   0.063   0.9495
## pds_p_ss_categoryMid              0.2640472  0.1805458   1.462   0.1437
## race.ethnicity.5levelBlack       -0.2273591  0.4996946  -0.455   0.6492
## race.ethnicity.5levelMixed        0.5591203  0.4864831   1.149   0.2506
## race.ethnicity.5levelOther        0.7739368  0.5548199   1.395   0.1632
## race.ethnicity.5levelWhite        0.7948214  0.4581901   1.735   0.0829 .
## interview_age                     0.0011649  0.0091550   0.127   0.8988
## bmi                               0.0170123  0.0182750   0.931   0.3520
## household.income[>=200K]         -1.1263754  0.4621622  -2.437   0.0149 *
```

```
## household.income[100K-200K]             -0.6426355  0.4305829  -1.492   0.1357
## household.income[12K-16K]                 0.1115583  0.5780881   0.193   0.8470
## household.income[16K-25K]                 0.5264156  0.4843782   1.087   0.2772
## household.income[25K-35K]                -0.0683600  0.4526886  -0.151   0.8800
## household.income[35K-50K]                 0.0383381  0.4362046   0.088   0.9300
## household.income[50K-75K]                -0.0573583  0.4338575  -0.132   0.8948
## household.income[5K-12K]                  0.0881304  0.5052998   0.174   0.8616
## household.income[75K-100K]               -0.3739521  0.4356868  -0.858   0.3908
## high.educBachelor                         0.2963089  0.4314649   0.687   0.4923
## high.educHS Diploma/GED                  -0.2201014  0.4319043  -0.510   0.6104
## high.educPost Graduate Degree             0.6394792  0.4355276   1.468   0.1422
## high.educSome College                     0.4654983  0.4058967   1.147   0.2516
## demo_race_hispanic1                      -0.0917669  0.2014228  -0.456   0.6487
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0197
## lmer.REML =  11447  Scale est. = 5.139     n = 2257
```

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)                        2.308e+00  1.231e+00   1.875  0.06087 .
## hormone_scr_ert_mean              -1.193e-03  2.883e-03  -0.414  0.67908
## hormone_sal_end_min_since_midnight -7.156e-06  3.689e-04  -0.019  0.98453
## pds_p_ss_categoryEarly             4.553e-01  1.484e-01   3.068  0.00218 **
## pds_p_ss_categoryLate              7.224e-01  9.608e-01   0.752  0.45223
## pds_p_ss_categoryMid               3.621e-01  3.057e-01   1.184  0.23633
## race.ethnicity.5levelBlack         4.371e-01  4.503e-01   0.971  0.33177
## race.ethnicity.5levelMixed         1.180e+00  4.385e-01   2.691  0.00718 **
## race.ethnicity.5levelOther         1.012e+00  5.195e-01   1.948  0.05152 .
## race.ethnicity.5levelWhite         1.152e+00  4.086e-01   2.819  0.00485 **
## interview_age                     -8.399e-03  8.357e-03  -1.005  0.31496
## bmi                                2.128e-02  1.764e-02   1.207  0.22773
## household.income[>=200K]          -9.730e-01  4.435e-01  -2.194  0.02834 *
## household.income[100K-200K]       -9.170e-01  4.122e-01  -2.225  0.02619 *
## household.income[12K-16K]         -1.821e-01  5.557e-01  -0.328  0.74319
## household.income[16K-25K]          1.457e-01  4.569e-01   0.319  0.74983
## household.income[25K-35K]         -2.768e-01  4.462e-01  -0.620  0.53501
## household.income[35K-50K]         -1.570e-01  4.292e-01  -0.366  0.71450
## household.income[50K-75K]         -6.327e-01  4.111e-01  -1.539  0.12396
## household.income[5K-12K]           1.802e-01  4.808e-01   0.375  0.70781
```

```
## household.income[75K-100K]            -7.496e-01  4.190e-01  -1.789  0.07372 .
## high.educBachelor                      4.385e-01  4.059e-01   1.080  0.28014
## high.educHS Diploma/GED                -2.184e-01  4.108e-01  -0.532  0.59495
## high.educPost Graduate Degree           4.188e-01  4.119e-01   1.017  0.30932
## high.educSome College                   3.246e-01  3.862e-01   0.841  0.40065
## demo_race_hispanic1                     -1.314e-01  1.872e-01  -0.702  0.48268
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0106
## lmer.REML =  12436  Scale est. = 6.125     n = 2463
```

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)                          6.246e-01  6.300e-01   0.991  0.32161
## hormone_scr_ert_mean                -1.127e-03  1.945e-03  -0.579  0.56242
## hormone_sal_end_min_since_midnight   7.072e-06  1.880e-04   0.038  0.96999
## PDS_score                            1.618e-01  5.034e-02   3.214  0.00133 **
## race.ethnicity.5levelBlack          -1.199e-01  2.419e-01  -0.496  0.62029
## race.ethnicity.5levelMixed           1.839e-01  2.356e-01   0.781  0.43513
## race.ethnicity.5levelOther           3.411e-01  2.697e-01   1.265  0.20606
## race.ethnicity.5levelWhite           2.583e-01  2.215e-01   1.167  0.24351
## interview_age                       -1.840e-03  4.386e-03  -0.420  0.67485
## bmi                                  2.304e-02  8.593e-03   2.682  0.00738 **
## household.income[>=200K]            -6.289e-01  2.243e-01  -2.803  0.00510 **
## household.income[100K-200K]         -5.551e-01  2.094e-01  -2.651  0.00808 **
## household.income[12K-16K]           -4.890e-04  2.813e-01  -0.002  0.99861
## household.income[16K-25K]           -1.021e-02  2.357e-01  -0.043  0.96547
## household.income[25K-35K]           -1.701e-01  2.203e-01  -0.772  0.44000
## household.income[35K-50K]           -2.832e-01  2.121e-01  -1.335  0.18188
## household.income[50K-75K]           -3.004e-01  2.110e-01  -1.423  0.15475
## household.income[5K-12K]             2.464e-01  2.456e-01   1.003  0.31578
## household.income[75K-100K]          -4.610e-01  2.118e-01  -2.177  0.02960 *
## high.educBachelor                    1.721e-02  2.097e-01   0.082  0.93459
## high.educHS Diploma/GED             -1.017e-01  2.105e-01  -0.483  0.62901
## high.educPost Graduate Degree       -1.680e-03  2.116e-01  -0.008  0.99367
## high.educSome College                8.515e-02  1.975e-01   0.431  0.66640
## demo_race_hispanic1                 -1.400e-02  9.623e-02  -0.145  0.88436
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0283
## lmer.REML = 8251.6  Scale est. = 1.4688    n = 2257
```

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)                        1.075e+00  6.715e-01   1.601 0.109507
## hormone_scr_ert_mean              -2.851e-04  1.581e-03  -0.180 0.856852
## hormone_sal_end_min_since_midnight -2.303e-05  1.939e-04  -0.119 0.905476
## PDS_score                          1.585e-01  6.772e-02   2.341 0.019320 *
## race.ethnicity.5levelBlack         9.315e-02  2.467e-01   0.378 0.705770
## race.ethnicity.5levelMixed         4.539e-01  2.412e-01   1.882 0.059960 .
## race.ethnicity.5levelOther         2.293e-01  2.853e-01   0.803 0.421771
## race.ethnicity.5levelWhite         3.474e-01  2.236e-01   1.554 0.120400
## interview_age                     -3.247e-03  4.596e-03  -0.706 0.479954
## bmi                                2.147e-02  9.798e-03   2.191 0.028560 *
## household.income[>=200K]          -8.922e-01  2.436e-01  -3.663 0.000255 ***
## household.income[100K-200K]       -8.731e-01  2.269e-01  -3.848 0.000122 ***
## household.income[12K-16K]         -3.926e-01  3.067e-01  -1.280 0.200623
## household.income[16K-25K]         -3.752e-02  2.518e-01  -0.149 0.881547
## household.income[25K-35K]         -3.347e-01  2.459e-01  -1.361 0.173652
## household.income[35K-50K]         -3.062e-01  2.366e-01  -1.294 0.195748
## household.income[50K-75K]         -4.264e-01  2.264e-01  -1.883 0.059762 .
## household.income[5K-12K]           3.888e-01  2.653e-01   1.466 0.142823
## household.income[75K-100K]        -7.165e-01  2.309e-01  -3.103 0.001937 **
## high.educBachelor                  1.438e-01  2.219e-01   0.648 0.517205
## high.educHS Diploma/GED            2.087e-02  2.253e-01   0.093 0.926194
## high.educPost Graduate Degree      9.121e-02  2.254e-01   0.405 0.685827
## high.educSome College              2.066e-01  2.115e-01   0.977 0.328864
## demo_race_hispanic1               -3.018e-01  9.845e-02  -3.066 0.002195 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0359
## lmer.REML = 9547.7  Scale est. = 2.1012    n = 2463
```

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)                       9.203e-01  6.505e-01   1.415  0.15732
## hormone_scr_ert_mean             -6.505e-04  1.928e-03  -0.337  0.73587
## hormone_sal_end_min_since_midnight -1.992e-05 1.883e-04  -0.106  0.91573
## pds_p_ss_categoryEarly            1.888e-01  8.761e-02   2.155  0.03128 *
## pds_p_ss_categoryLate             4.698e-01  2.218e-01   2.118  0.03429 *
## pds_p_ss_categoryMid              2.555e-01  8.813e-02   2.899  0.00378 **
## race.ethnicity.5levelBlack       -9.030e-02  2.419e-01  -0.373  0.70897
## race.ethnicity.5levelMixed        2.042e-01  2.357e-01   0.866  0.38636
## race.ethnicity.5levelOther        3.710e-01  2.695e-01   1.377  0.16880
## race.ethnicity.5levelWhite        2.777e-01  2.216e-01   1.253  0.21024
## interview_age                    -2.852e-03  4.476e-03  -0.637  0.52399
## bmi                               1.909e-02  8.922e-03   2.139  0.03253 *
## household.income[>=200K]         -6.359e-01  2.245e-01  -2.832  0.00466 **
## household.income[100K-200K]      -5.768e-01  2.095e-01  -2.753  0.00595 **
## household.income[12K-16K]        -2.023e-02  2.817e-01  -0.072  0.94276
## household.income[16K-25K]        -3.365e-02  2.361e-01  -0.142  0.88671
## household.income[25K-35K]        -2.003e-01  2.206e-01  -0.908  0.36395
## household.income[35K-50K]        -3.148e-01  2.124e-01  -1.482  0.13853
## household.income[50K-75K]        -3.205e-01  2.112e-01  -1.517  0.12934
## household.income[5K-12K]          2.335e-01  2.460e-01   0.949  0.34275
## household.income[75K-100K]       -4.777e-01  2.120e-01  -2.254  0.02432 *
## high.educBachelor                 2.366e-02  2.100e-01   0.113  0.91033
## high.educHS Diploma/GED          -8.196e-02  2.106e-01  -0.389  0.69724
## high.educPost Graduate Degree     5.126e-03  2.120e-01   0.024  0.98071
## high.educSome College             9.762e-02  1.976e-01   0.494  0.62140
## demo_race_hispanic1              -2.586e-02  9.656e-02  -0.268  0.78886
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0271
## lmer.REML = 8255.4  Scale est. = 1.4514    n = 2257
```

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)                      1.1665938  0.6749901   1.728 0.084059 .
## hormone_scr_ert_mean            -0.0001880  0.0015777  -0.119 0.905145
## hormone_sal_end_min_since_midnight -0.0000192  0.0001940  -0.099 0.921167
## pds_p_ss_categoryEarly           0.1313489  0.0818886   1.604 0.108845
## pds_p_ss_categoryLate            0.2894532  0.5323977   0.544 0.586712
## pds_p_ss_categoryMid             0.3361054  0.1685691   1.994 0.046277 *
## race.ethnicity.5levelBlack       0.0888110  0.2468959   0.360 0.719095
## race.ethnicity.5levelMixed       0.4565796  0.2412857   1.892 0.058572 .
## race.ethnicity.5levelOther       0.2303329  0.2856011   0.806 0.420042
## race.ethnicity.5levelWhite       0.3533620  0.2237485   1.579 0.114401
## interview_age                   -0.0030259  0.0045917  -0.659 0.509971
## bmi                              0.0230695  0.0097288   2.371 0.017805 *
## household.income[>=200K]        -0.8988126  0.2434309  -3.692 0.000227 ***
## household.income[100K-200K]     -0.8753283  0.2269456  -3.857 0.000118 ***
## household.income[12K-16K]       -0.3904295  0.3068079  -1.273 0.203298
## household.income[16K-25K]       -0.0417366  0.2517655  -0.166 0.868347
## household.income[25K-35K]       -0.3397961  0.2460621  -1.381 0.167425
## household.income[35K-50K]       -0.3046415  0.2367526  -1.287 0.198303
## household.income[50K-75K]       -0.4281662  0.2264267  -1.891 0.058747 .
## household.income[5K-12K]         0.3707624  0.2652299   1.398 0.162273
## household.income[75K-100K]      -0.7199419  0.2308831  -3.118 0.001841 **
## high.educBachelor                0.1547225  0.2224378   0.696 0.486760
## high.educHS Diploma/GED          0.0313478  0.2255851   0.139 0.889491
## high.educPost Graduate Degree    0.1061620  0.2259491   0.470 0.638505
## high.educSome College            0.2185057  0.2120417   1.030 0.302885
## demo_race_hispanic1             -0.3118797  0.0986979  -3.160 0.001597 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0354
## lmer.REML = 9548.4  Scale est. = 2.1139    n = 2463
```

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)                           5.992e-01  7.569e-01   0.792  0.42860
## hormone_scr_ert_mean                 -2.427e-03  2.333e-03  -1.040  0.29826
## hormone_sal_end_min_since_midnight    3.149e-05  2.245e-04   0.140  0.88846
## PDS_score                             1.754e-01  6.055e-02   2.897  0.00381 **
## race.ethnicity.5levelBlack           -9.862e-02  2.920e-01  -0.338  0.73562
## race.ethnicity.5levelMixed            4.250e-01  2.845e-01   1.494  0.13536
## race.ethnicity.5levelOther            6.408e-01  3.256e-01   1.968  0.04918 *
## race.ethnicity.5levelWhite            5.492e-01  2.671e-01   2.056  0.03987 *
## interview_age                        -2.984e-03  5.261e-03  -0.567  0.57064
## bmi                                   2.304e-02  1.034e-02   2.227  0.02602 *
## household.income[>=200K]             -6.819e-01  2.713e-01  -2.513  0.01204 *
## household.income[100K-200K]          -5.474e-01  2.532e-01  -2.162  0.03073 *
## household.income[12K-16K]             4.327e-02  3.400e-01   0.127  0.89873
## household.income[16K-25K]             1.152e-01  2.850e-01   0.404  0.68606
## household.income[25K-35K]            -1.170e-01  2.662e-01  -0.439  0.66036
## household.income[35K-50K]            -4.895e-02  2.566e-01  -0.191  0.84875
## household.income[50K-75K]            -1.710e-01  2.553e-01  -0.670  0.50307
## household.income[5K-12K]              2.552e-02  2.975e-01   0.086  0.93163
## household.income[75K-100K]           -3.145e-01  2.562e-01  -1.228  0.21967
## high.educBachelor                     7.634e-02  2.533e-01   0.301  0.76317
## high.educHS Diploma/GED              -3.330e-02  2.540e-01  -0.131  0.89570
## high.educPost Graduate Degree         1.235e-01  2.557e-01   0.483  0.62911
## high.educSome College                 1.481e-01  2.386e-01   0.621  0.53474
## demo_race_hispanic1                  -4.992e-02  1.155e-01  -0.432  0.66551
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## 
## R-sq.(adj) =  0.0252
## lmer.REML = 9071.7  Scale est. = 1.684     n = 2257
```

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)                           0.8559867  0.8336791   1.027  0.30464
## hormone_scr_ert_mean                 -0.0001814  0.0019692  -0.092  0.92660
## hormone_sal_end_min_since_midnight    0.0001194  0.0002463   0.485  0.62781
## PDS_score                             0.2230779  0.0839940   2.656  0.00796 **
## race.ethnicity.5levelBlack            0.1702593  0.3063328   0.556  0.57840
## race.ethnicity.5levelMixed            0.6573891  0.2987805   2.200  0.02788 *
```

```
## race.ethnicity.5levelOther                0.4589636  0.3542317   1.296  0.19522
## race.ethnicity.5levelWhite                0.5610941  0.2776729   2.021  0.04342 *
## interview_age                            -0.0008859  0.0056971  -0.156  0.87644
## bmi                                       0.0010940  0.0121311   0.090  0.92815
## household.income[>=200K]                 -0.7753085  0.3034941  -2.555  0.01069 *
## household.income[100K-200K]              -0.7608843  0.2821305  -2.697  0.00705 **
## household.income[12K-16K]                 0.1049791  0.3798951   0.276  0.78231
## household.income[16K-25K]                 0.2419387  0.3130950   0.773  0.43976
## household.income[25K-35K]                -0.1414001  0.3056909  -0.463  0.64372
## household.income[35K-50K]                -0.0207402  0.2938355  -0.071  0.94373
## household.income[50K-75K]                -0.4060462  0.2815267  -1.442  0.14935
## household.income[5K-12K]                  0.5636655  0.3291781   1.712  0.08696 .
## household.income[75K-100K]               -0.6703922  0.2870132  -2.336  0.01958 *
## high.educBachelor                         0.3933856  0.2767592   1.421  0.15533
## high.educHS Diploma/GED                   0.0024116  0.2805426   0.009  0.99314
## high.educPost Graduate Degree             0.2394966  0.2809757   0.852  0.39409
## high.educSome College                     0.1956204  0.2634363   0.743  0.45781
## demo_race_hispanic1                      -0.3311881  0.1253070  -2.643  0.00827 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0198
## lmer.REML =  10572  Scale est. = 2.5148     n = 2463
```

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)                        8.652e-01  7.815e-01   1.107  0.26834
## hormone_scr_ert_mean              -1.733e-03  2.313e-03  -0.749  0.45381
## hormone_sal_end_min_since_midnight 6.095e-07  2.251e-04   0.003  0.99784
## pds_p_ss_categoryEarly             2.321e-01  1.051e-01   2.209  0.02730 *
## pds_p_ss_categoryLate              3.375e-01  2.656e-01   1.271  0.20392
## pds_p_ss_categoryMid               2.934e-01  1.061e-01   2.766  0.00572 **
## race.ethnicity.5levelBlack        -6.071e-02  2.921e-01  -0.208  0.83537
## race.ethnicity.5levelMixed         4.492e-01  2.847e-01   1.578  0.11478
## race.ethnicity.5levelOther         6.790e-01  3.255e-01   2.086  0.03711 *
## race.ethnicity.5levelWhite         5.709e-01  2.674e-01   2.135  0.03285 *
## interview_age                     -3.784e-03  5.366e-03  -0.705  0.48078
## bmi                                1.872e-02  1.074e-02   1.744  0.08129 .
## household.income[>=200K]          -6.912e-01  2.716e-01  -2.545  0.01098 *
```

```
## household.income[100K-200K]        -5.743e-01  2.533e-01  -2.267  0.02350 *
## household.income[12K-16K]           2.316e-02  3.405e-01   0.068  0.94577
## household.income[16K-25K]           8.513e-02  2.854e-01   0.298  0.76556
## household.income[25K-35K]          -1.493e-01  2.666e-01  -0.560  0.57548
## household.income[35K-50K]          -8.550e-02  2.570e-01  -0.333  0.73945
## household.income[50K-75K]          -1.941e-01  2.555e-01  -0.760  0.44748
## household.income[5K-12K]            1.979e-02  2.980e-01   0.066  0.94705
## household.income[75K-100K]         -3.359e-01  2.564e-01  -1.310  0.19030
## high.educBachelor                   8.707e-02  2.537e-01   0.343  0.73152
## high.educHS Diploma/GED            -7.606e-03  2.542e-01  -0.030  0.97613
## high.educPost Graduate Degree       1.354e-01  2.562e-01   0.528  0.59725
## high.educSome College               1.651e-01  2.388e-01   0.692  0.48931
## demo_race_hispanic1                -5.640e-02  1.160e-01  -0.486  0.62679
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.024
## lmer.REML = 9074.5  Scale est. = 1.6658    n = 2257
```

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)                        9.973e-01  8.382e-01   1.190  0.23422
## hormone_scr_ert_mean              -2.095e-05  1.966e-03  -0.011  0.99150
## hormone_sal_end_min_since_midnight 1.230e-04  2.462e-04   0.500  0.61743
## pds_p_ss_categoryEarly             2.109e-01  1.013e-01   2.082  0.03742 *
## pds_p_ss_categoryLate              1.913e-01  6.547e-01   0.292  0.77014
## pds_p_ss_categoryMid               3.983e-01  2.091e-01   1.905  0.05688 .
## race.ethnicity.5levelBlack         1.685e-01  3.067e-01   0.550  0.58268
## race.ethnicity.5levelMixed         6.640e-01  2.989e-01   2.221  0.02644 *
## race.ethnicity.5levelOther         4.642e-01  3.546e-01   1.309  0.19065
## race.ethnicity.5levelWhite         5.720e-01  2.778e-01   2.059  0.03962 *
## interview_age                     -6.067e-04  5.694e-03  -0.107  0.91516
## bmi                                3.478e-03  1.205e-02   0.289  0.77292
## household.income[>=200K]          -7.934e-01  3.034e-01  -2.615  0.00897 **
## household.income[100K-200K]       -7.737e-01  2.823e-01  -2.741  0.00617 **
## household.income[12K-16K]          1.024e-01  3.802e-01   0.269  0.78762
## household.income[16K-25K]          2.267e-01  3.132e-01   0.724  0.46919
## household.income[25K-35K]         -1.583e-01  3.060e-01  -0.517  0.60491
## household.income[35K-50K]         -2.848e-02  2.941e-01  -0.097  0.92287
## household.income[50K-75K]         -4.162e-01  2.816e-01  -1.478  0.13955
## household.income[5K-12K]           5.308e-01  3.292e-01   1.612  0.10706
```

```
## household.income[75K-100K]          -6.839e-01  2.871e-01  -2.382  0.01727 *
## high.educBachelor                    4.010e-01  2.775e-01   1.445  0.14857
## high.educHS Diploma/GED              1.659e-02  2.811e-01   0.059  0.95293
## high.educPost Graduate Degree        2.526e-01  2.817e-01   0.897  0.37000
## high.educSome College                2.062e-01  2.642e-01   0.781  0.43512
## demo_race_hispanic1                 -3.450e-01  1.256e-01  -2.748  0.00604 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0192
## lmer.REML =  10572  Scale est. = 2.5051    n = 2463
```

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)                     -4.068e-01  3.509e-01  -1.159   0.2465
## hormone_scr_ert_mean            -1.241e-03  1.274e-03  -0.975   0.3299
## hormone_sal_end_min_since_midnight -2.408e-05  1.268e-04  -0.190   0.8494
## interview_age                    5.334e-03  2.826e-03   1.888   0.0592 .
## MRI_minus_hormone_date_time     -2.321e-06  2.646e-06  -0.877   0.3805
## bmi                             -7.738e-03  5.289e-03  -1.463   0.1436
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00124
## lmer.REML =   4982  Scale est. = 0.76865   n = 1882
```

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)                       -2.859e-02  3.731e-01  -0.077   0.9389
## hormone_scr_ert_mean              -1.719e-03  9.460e-04  -1.817   0.0694 .
## hormone_sal_end_min_since_midnight -4.919e-06  1.292e-04  -0.038   0.9696
## interview_age                      1.481e-03  2.921e-03   0.507   0.6122
## MRI_minus_hormone_date_time        5.459e-07  2.628e-06   0.208   0.8355
## bmi                               -5.137e-03  6.052e-03  -0.849   0.3961
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000238
## lmer.REML = 5189.6  Scale est. = 0.65167   n = 1886
```

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)                       -1.719e-01  3.404e-01  -0.505    0.614
## hormone_scr_ert_mean              -2.867e-04  1.243e-03  -0.231    0.818
## hormone_sal_end_min_since_midnight -3.958e-05  1.230e-04  -0.322    0.748
## interview_age                      3.160e-03  2.738e-03   1.154    0.248
## MRI_minus_hormone_date_time       -1.949e-06  2.610e-06  -0.747    0.455
## bmi                               -8.463e-03  5.127e-03  -1.651    0.099 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000127
## lmer.REML = 4856.6  Scale est. = 0.71587   n = 1879
```

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)                        -3.170e-01  3.689e-01  -0.859    0.390
## hormone_scr_ert_mean               -7.038e-04  9.337e-04  -0.754    0.451
## hormone_sal_end_min_since_midnight -7.655e-06  1.300e-04  -0.059    0.953
## interview_age                       4.387e-03  2.889e-03   1.518    0.129
## MRI_minus_hormone_date_time         1.274e-06  2.549e-06   0.500    0.617
## bmi                                -9.536e-03  6.043e-03  -1.578    0.115
##
##
## R-sq.(adj) =  0.000338
## lmer.REML = 5145.2  Scale est. = 0.69223   n = 1886
```

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)                        -5.548e-02  2.672e-01  -0.208   0.8355
## hormone_scr_ert_mean               -1.893e-03  9.691e-04  -1.953   0.0509 .
## hormone_sal_end_min_since_midnight -6.136e-05  9.501e-05  -0.646   0.5185
## interview_age                       2.262e-03  2.151e-03   1.051   0.2932
## MRI_minus_hormone_date_time        -2.218e-06  2.054e-06  -1.080   0.2802
## bmi                                -4.580e-03  4.029e-03  -1.137   0.2558
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) =  0.00238
## lmer.REML = 3969.5  Scale est. = 0.42741   n = 1883
```

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)                         5.318e-01  2.914e-01   1.825   0.0681 .
## hormone_scr_ert_mean               -7.485e-04  7.313e-04  -1.024   0.3062
## hormone_sal_end_min_since_midnight -2.242e-04  9.849e-05  -2.277   0.0229 *
## interview_age                      -2.545e-03  2.280e-03  -1.117   0.2643
## MRI_minus_hormone_date_time         2.750e-06  2.004e-06   1.372   0.1702
## bmi                                -1.732e-03  4.709e-03  -0.368   0.7131
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00191
## lmer.REML = 4286.2  Scale est. = 0.49185   n = 1889
```

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)                         1.297e+00  3.356e-01   3.864 0.000115 ***
## hormone_scr_ert_mean                2.663e-03  1.206e-03   2.208 0.027366 *
## hormone_sal_end_min_since_midnight -2.425e-04  1.140e-04  -2.127 0.033577 *
## interview_age                      -9.477e-03  2.693e-03  -3.519 0.000443 ***
```

```
## MRI_minus_hormone_date_time       -2.254e-06  2.506e-06  -0.899 0.368647
## bmi                               -4.982e-03  5.029e-03  -0.991 0.322026
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00878
## lmer.REML = 4812.8  Scale est. = 0.73039   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)                        1.215e-01  3.445e-01   0.353    0.724
## hormone_scr_ert_mean               4.304e-04  8.609e-04   0.500    0.617
## hormone_sal_end_min_since_midnight -1.016e-04  1.184e-04  -0.858    0.391
## interview_age                     -2.376e-04  2.693e-03  -0.088    0.930
## MRI_minus_hormone_date_time        1.176e-06  2.372e-06   0.496    0.620
## bmi                                4.502e-04  5.578e-03   0.081    0.936
##
##
## R-sq.(adj) =  -0.00198
## lmer.REML = 4905.9  Scale est. = 0.75887   n = 1886
```

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|)
```

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```
## (Intercept)                             1.025e+00  3.192e-01   3.211  0.00134 **
## hormone_scr_ert_mean                     3.333e-03  1.154e-03   2.887  0.00393 **
## hormone_sal_end_min_since_midnight -3.148e-04  1.114e-04  -2.826  0.00477 **
## interview_age                           -6.810e-03  2.564e-03  -2.656  0.00798 **
## MRI_minus_hormone_date_time             -8.979e-07  2.410e-06  -0.373  0.70947
## bmi                                     -7.652e-03  4.802e-03  -1.593  0.11122
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00999
## lmer.REML = 4628.4  Scale est. = 0.65827   n = 1881
```

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)                        3.253e-01  3.426e-01   0.949    0.343
## hormone_scr_ert_mean              -1.480e-04  8.605e-04  -0.172    0.864
## hormone_sal_end_min_since_midnight 5.677e-05  1.237e-04   0.459    0.646
## interview_age                     -2.906e-03  2.679e-03  -1.085    0.278
## MRI_minus_hormone_date_time       -4.820e-07  2.399e-06  -0.201    0.841
## bmi                                3.229e-03  5.580e-03   0.579    0.563
##
##
## R-sq.(adj) =  -0.00267
## lmer.REML = 4890.8  Scale est. = 0.68965   n = 1893
```

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)                     6.414e-01  2.479e-01   2.587  0.00976 **
## hormone_scr_ert_mean           -2.479e-04  8.939e-04  -0.277  0.78152
## hormone_sal_end_min_since_midnight -1.613e-04  8.442e-05  -1.910  0.05628 .
## interview_age                  -4.598e-03  1.993e-03  -2.308  0.02113 *
## MRI_minus_hormone_date_time    -5.216e-06  1.852e-06  -2.816  0.00491 **
## bmi                             1.837e-03  3.714e-03   0.495  0.62088
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00773
## lmer.REML = 3708.9  Scale est. = 0.4018    n = 1887
```

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)                     1.468e-01  2.810e-01   0.522    0.601
## hormone_scr_ert_mean            5.469e-04  7.080e-04   0.773    0.440
## hormone_sal_end_min_since_midnight -1.376e-04  9.766e-05  -1.409    0.159
## interview_age                  -9.448e-05  2.199e-03  -0.043    0.966
## MRI_minus_hormone_date_time     7.264e-07  1.932e-06   0.376    0.707
## bmi                             3.086e-04  4.549e-03   0.068    0.946
##
##
## R-sq.(adj) =  -0.000817
## lmer.REML = 4115.2  Scale est. = 0.4069    n = 1885
```

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)                       -7.390e-02  2.245e-01  -0.329    0.742
## hormone_scr_ert_mean              -3.508e-04  8.105e-04  -0.433    0.665
## hormone_sal_end_min_since_midnight 5.443e-05  7.656e-05   0.711    0.477
## interview_age                      5.796e-04  1.808e-03   0.321    0.749
## MRI_minus_hormone_date_time        5.600e-08  1.676e-06   0.033    0.973
## bmi                               -5.870e-04  3.377e-03  -0.174    0.862
##
##
## R-sq.(adj) =  -0.0022
## lmer.REML = 3307.6  Scale est. = 0.30165   n = 1878


## 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)                       -2.487e-02  2.575e-01  -0.097    0.923
## hormone_scr_ert_mean               3.533e-04  9.297e-04   0.380    0.704
## hormone_sal_end_min_since_midnight 5.004e-06  8.753e-05   0.057    0.954
## interview_age                     -2.698e-04  2.072e-03  -0.130    0.896
## MRI_minus_hormone_date_time        1.951e-06  1.923e-06   1.014    0.311
## bmi                                1.885e-03  3.857e-03   0.489    0.625
##
##
## R-sq.(adj) =  -0.00184
## lmer.REML = 3825.9  Scale est. = 0.4317    n = 1878
```

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)                       -3.177e-01  2.435e-01  -1.305   0.1922
## hormone_scr_ert_mean              -1.116e-03  6.165e-04  -1.810   0.0705 .
## hormone_sal_end_min_since_midnight  2.198e-05  8.360e-05   0.263   0.7926
## interview_age                      2.772e-03  1.908e-03   1.453   0.1465
## MRI_minus_hormone_date_time        3.250e-06  1.666e-06   1.951   0.0512 .
## bmi                                4.452e-04  3.961e-03   0.112   0.9105
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =   0.0028
## lmer.REML = 3581.6  Scale est. = 0.29044   n = 1883


## 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)                       -2.607e-01  2.666e-01  -0.978    0.328
## hormone_scr_ert_mean              -1.885e-04  6.704e-04  -0.281    0.779
## hormone_sal_end_min_since_midnight -6.112e-06  9.013e-05  -0.068    0.946
## interview_age                      1.510e-03  2.088e-03   0.723    0.470
## MRI_minus_hormone_date_time        2.721e-06  1.867e-06   1.457    0.145
## bmi                                4.747e-03  4.306e-03   1.102    0.271
##
##
## R-sq.(adj) =  -0.000241
## lmer.REML = 3924.7  Scale est. = 0.39503   n = 1880
```

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)                         3.964e-01  1.949e-01   2.034   0.0421 *
## hormone_scr_ert_mean                1.243e-03  7.026e-04   1.769   0.0771 .
## hormone_sal_end_min_since_midnight -1.098e-04  6.670e-05  -1.647   0.0998 .
## interview_age                      -3.060e-03  1.567e-03  -1.953   0.0510 .
## MRI_minus_hormone_date_time        -1.935e-06  1.453e-06  -1.331   0.1832
## bmi                                -6.448e-04  2.930e-03  -0.220   0.8258
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00352
## lmer.REML = 2785.4  Scale est. = 0.21157   n = 1880


## 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)                         2.110e-01  2.397e-01   0.880   0.3789
## hormone_scr_ert_mean                1.076e-03  8.672e-04   1.241   0.2148
## hormone_sal_end_min_since_midnight -1.439e-04  8.346e-05  -1.725   0.0848 .
## interview_age                      -1.426e-03  1.930e-03  -0.739   0.4601
## MRI_minus_hormone_date_time        -2.465e-06  1.795e-06  -1.373   0.1698
## bmi                                 1.651e-03  3.613e-03   0.457   0.6477
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00194
## lmer.REML = 3558.7  Scale est. = 0.3211    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)                     -1.818e-02  2.176e-01  -0.084   0.9334
## hormone_scr_ert_mean             4.510e-04  5.456e-04   0.827   0.4085
## hormone_sal_end_min_since_midnight -5.715e-05  7.370e-05  -0.776   0.4381
## interview_age                    1.832e-03  1.701e-03   1.077   0.2817
## MRI_minus_hormone_date_time      1.409e-06  1.489e-06   0.947   0.3439
## bmi                             -7.387e-03  3.526e-03  -2.095   0.0363 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00114
## lmer.REML = 3208.6  Scale est. = 0.30622   n = 1893


## 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)                      8.848e-02  2.542e-01   0.348    0.728
## hormone_scr_ert_mean             1.922e-04  6.431e-04   0.299    0.765
## hormone_sal_end_min_since_midnight -8.521e-05  8.601e-05  -0.991    0.322
## interview_age                    4.421e-04  1.989e-03   0.222    0.824
## MRI_minus_hormone_date_time      1.922e-06  1.733e-06   1.109    0.268
## bmi                             -2.504e-03  4.124e-03  -0.607    0.544
##
##
## R-sq.(adj) =  -0.00145
## lmer.REML = 3770.4  Scale est. = 0.31251   n = 1891
```

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)                        -5.585e-01  3.469e-01  -1.610   0.1075
## hormone_scr_ert_mean               -6.747e-04  1.248e-03  -0.541   0.5889
## hormone_sal_end_min_since_midnight  3.685e-05  1.161e-04   0.317   0.7510
## interview_age                       5.613e-03  2.771e-03   2.026   0.0429 *
## bmi                                -3.301e-03  5.231e-03  -0.631   0.5281
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000514
## lmer.REML = 5518.6  Scale est. = 0.68647   n = 2046


##
## 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)                        -2.263e-01  3.509e-01  -0.645    0.519
## hormone_scr_ert_mean                3.866e-04  1.262e-03   0.306    0.759
## hormone_sal_end_min_since_midnight  1.155e-06  1.172e-04   0.010    0.992
## interview_age                       3.161e-03  2.802e-03   1.128    0.259
## bmi                                -7.901e-03  5.280e-03  -1.496    0.135
##
##
## R-sq.(adj) =  -0.000116
## lmer.REML = 5565.7  Scale est. = 0.76398   n = 2046
```

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)                         1.428e-01  3.266e-01   0.437    0.662
## hormone_scr_ert_mean               -1.149e-03  8.503e-04  -1.352    0.177
## hormone_sal_end_min_since_midnight -3.458e-05  1.116e-04  -0.310    0.757
```

```
## interview_age                             -4.123e-04  2.560e-03  -0.161    0.872
## bmi                                       -2.228e-03  5.275e-03  -0.422    0.673
##
##
## R-sq.(adj) =  -0.000373
## lmer.REML = 5562.5  Scale est. = 0.66381    n = 2137


##
## 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)                      1.708e-01  3.283e-01   0.520    0.603
## hormone_scr_ert_mean            -6.494e-04  8.521e-04  -0.762    0.446
## hormone_sal_end_min_since_midnight -6.928e-06  1.094e-04  -0.063    0.950
## interview_age                   -1.410e-03  2.571e-03  -0.548    0.584
## bmi                              2.097e-03  5.285e-03   0.397    0.692
##
##
## R-sq.(adj) =  -0.00137
## lmer.REML = 5593.2  Scale est. = 0.68489    n = 2137
```

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)                      1.891e-01  3.373e-01   0.561   0.5751
## hormone_scr_ert_mean            -1.047e-03  1.184e-03  -0.885   0.3765
## hormone_sal_end_min_since_midnight  4.125e-06  1.215e-04   0.034   0.9729
## interview_age                   -3.263e-03  2.696e-03  -1.211   0.2262
## bmi                              1.011e-02  5.036e-03   2.007   0.0448 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00221
## lmer.REML = 7037.4  Scale est. = 0.71283    n = 2491
```

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)                      -0.2002233  0.3184358  -0.629  0.52955
## hormone_scr_ert_mean              0.0004406  0.0008727   0.505  0.61369
## hormone_sal_end_min_since_midnight 0.0002322  0.0001142   2.034  0.04206 *
## interview_age                    -0.0019031  0.0025100  -0.758  0.44839
## bmi                               0.0163231  0.0051196   3.188  0.00145 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00639
## lmer.REML = 7457.8  Scale est. = 0.68865   n = 2694
```

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)                       5.111e+00  2.546e+00   2.007
## PDS_score                         6.082e-01  2.040e-01   2.982
## hormone_sal_end_min_since_midnight -9.330e-04  7.775e-04  -1.200
## hormone_scr_ert_mean             -4.660e-03  8.069e-03  -0.577
## accumbens_rvsn_ant_z              7.823e-02  3.925e-01   0.199
## race.ethnicity.5levelBlack       -1.556e-01  9.880e-01  -0.158
```

```
## race.ethnicity.5levelMixed                     1.890e+00  9.440e-01   2.002
## race.ethnicity.5levelOther                     1.729e+00  1.068e+00   1.619
## race.ethnicity.5levelWhite                     1.439e+00  8.879e-01   1.620
## demo_race_hispanic1                            9.539e-02  3.903e-01   0.244
## interview_age                                 -1.007e-02  1.746e-02  -0.577
## MRI_minus_hormone_date_time                   -8.684e-06  1.650e-05  -0.526
## bmi                                            6.778e-02  3.462e-02   1.958
## household.income[>=200K]                      -2.564e+00  9.640e-01  -2.659
## household.income[100K-200K]                   -2.035e+00  9.088e-01  -2.239
## household.income[12K-16K]                     -3.155e-02  1.184e+00  -0.027
## household.income[16K-25K]                     -1.513e-01  1.015e+00  -0.149
## household.income[25K-35K]                     -1.365e+00  9.590e-01  -1.423
## household.income[35K-50K]                     -4.729e-01  9.180e-01  -0.515
## household.income[50K-75K]                     -1.240e+00  9.182e-01  -1.350
## household.income[5K-12K]                      -2.171e-01  1.062e+00  -0.204
## household.income[75K-100K]                    -1.526e+00  9.195e-01  -1.660
## high.educBachelor                             -3.470e-01  8.572e-01  -0.405
## high.educHS Diploma/GED                       -1.165e+00  8.767e-01  -1.329
## high.educPost Graduate Degree                 -3.700e-02  8.654e-01  -0.043
## high.educSome College                         -1.098e-01  8.112e-01  -0.135
## hormone_scr_ert_mean:accumbens_rvsn_ant_z     -2.731e-03  1.000e-02  -0.273
##                                  Pr(>|t|)
## (Intercept)                       0.04489 *
## PDS_score                         0.00291 **
## hormone_sal_end_min_since_midnight 0.23032
## hormone_scr_ert_mean              0.56372
## accumbens_rvsn_ant_z              0.84203
## race.ethnicity.5levelBlack        0.87484
## race.ethnicity.5levelMixed        0.04541 *
## race.ethnicity.5levelOther        0.10569
## race.ethnicity.5levelWhite        0.10532
## demo_race_hispanic1               0.80693
## interview_age                     0.56420
## MRI_minus_hormone_date_time       0.59875
## bmi                               0.05042 .
## household.income[>=200K]          0.00790 **
## household.income[100K-200K]       0.02527 *
## household.income[12K-16K]         0.97874
## household.income[16K-25K]         0.88152
## household.income[25K-35K]         0.15488
## household.income[35K-50K]         0.60653
## household.income[50K-75K]         0.17711
## household.income[5K-12K]          0.83805
## household.income[75K-100K]        0.09709 .
## high.educBachelor                 0.68567
## high.educHS Diploma/GED           0.18401
## high.educPost Graduate Degree     0.96590
## high.educSome College             0.89232
## hormone_scr_ert_mean:accumbens_rvsn_ant_z  0.78481
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0265
```

```
## lmer.REML =  10493  Scale est. = 10.936    n = 1713
```

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)                                   2.597e+00  2.522e+00   1.030
## PDS_score                                     6.869e-01  2.589e-01   2.653
## hormone_sal_end_min_since_midnight            3.382e-04  7.526e-04   0.449
## hormone_scr_ert_mean                         -1.780e-03  5.920e-03  -0.301
## accumbens_rvsn_ant_z                          3.184e-02  2.414e-01   0.132
## race.ethnicity.5levelBlack                   -2.239e-02  9.623e-01  -0.023
## race.ethnicity.5levelMixed                    2.269e+00  9.256e-01   2.451
## race.ethnicity.5levelOther                    1.777e+00  1.078e+00   1.649
## race.ethnicity.5levelWhite                    1.694e+00  8.685e-01   1.951
## demo_race_hispanic1                          -5.115e-01  3.736e-01  -1.369
## interview_age                                -6.818e-03  1.666e-02  -0.409
## MRI_minus_hormone_date_time                  -6.697e-06  1.436e-05  -0.466
## bmi                                           4.846e-02  3.660e-02   1.324
## household.income[>=200K]                     -1.450e+00  1.017e+00  -1.426
## household.income[100K-200K]                  -1.001e+00  9.630e-01  -1.040
## household.income[12K-16K]                    -3.820e-01  1.242e+00  -0.307
## household.income[16K-25K]                     1.282e+00  1.047e+00   1.224
## household.income[25K-35K]                     1.569e-01  1.019e+00   0.154
## household.income[35K-50K]                     5.668e-01  9.864e-01   0.575
## household.income[50K-75K]                    -2.525e-01  9.619e-01  -0.263
## household.income[5K-12K]                      1.684e+00  1.100e+00   1.531
## household.income[75K-100K]                   -7.145e-01  9.746e-01  -0.733
## high.educBachelor                             1.557e-01  8.406e-01   0.185
## high.educHS Diploma/GED                      -1.171e+00  8.649e-01  -1.354
## high.educPost Graduate Degree                -5.469e-02  8.508e-01  -0.064
## high.educSome College                         2.756e-01  8.031e-01   0.343
## hormone_scr_ert_mean:accumbens_rvsn_ant_z    -3.746e-03  5.507e-03  -0.680
##                                              Pr(>|t|)
## (Intercept)                                   0.30337
## PDS_score                                     0.00805 **
## hormone_sal_end_min_since_midnight            0.65318
## hormone_scr_ert_mean                          0.76369
## accumbens_rvsn_ant_z                          0.89507
## race.ethnicity.5levelBlack                    0.98144
```

```
## race.ethnicity.5levelMixed                0.01434 *
## race.ethnicity.5levelOther                0.09926 .
## race.ethnicity.5levelWhite                0.05122 .
## demo_race_hispanic1                       0.17114
## interview_age                             0.68237
## MRI_minus_hormone_date_time               0.64099
## bmi                                       0.18564
## household.income[>=200K]                  0.15400
## household.income[100K-200K]               0.29857
## household.income[12K-16K]                 0.75852
## household.income[16K-25K]                 0.22119
## household.income[25K-35K]                 0.87763
## household.income[35K-50K]                 0.56564
## household.income[50K-75K]                 0.79296
## household.income[5K-12K]                  0.12600
## household.income[75K-100K]                0.46359
## high.educBachelor                         0.85307
## high.educHS Diploma/GED                   0.17586
## high.educPost Graduate Degree             0.94876
## high.educSome College                     0.73152
## hormone_scr_ert_mean:accumbens_rvsn_ant_z  0.49645
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0245
## lmer.REML =  10534  Scale est. = 15.309    n = 1731
```

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)                        4.990e+00  2.546e+00   1.960  0.05020
## PDS_score                          6.216e-01  2.038e-01   3.050  0.00232
## hormone_sal_end_min_since_midnight -9.183e-04  7.771e-04  -1.182  0.23751
## hormone_scr_ert_mean              -4.610e-03  8.073e-03  -0.571  0.56800
## caudate_rvsn_ant_z                 1.361e-02  3.148e-01   0.043  0.96552
```

```
## race.ethnicity.5levelBlack              -1.077e-01  9.880e-01   -0.109  0.91317
## race.ethnicity.5levelMixed               1.853e+00  9.427e-01    1.966  0.04950
## race.ethnicity.5levelOther               1.717e+00  1.064e+00    1.613  0.10686
## race.ethnicity.5levelWhite               1.433e+00  8.872e-01    1.615  0.10640
## demo_race_hispanic1                       1.018e-01  3.887e-01    0.262  0.79332
## interview_age                            -1.115e-02  1.749e-02   -0.637  0.52400
## MRI_minus_hormone_date_time              -8.347e-06  1.610e-05   -0.518  0.60426
## bmi                                       6.868e-02  3.464e-02    1.983  0.04752
## household.income[>=200K]                 -2.408e+00  9.598e-01   -2.508  0.01222
## household.income[100K-200K]              -1.868e+00  9.032e-01   -2.068  0.03878
## household.income[12K-16K]                 9.953e-02  1.170e+00    0.085  0.93222
## household.income[16K-25K]                -7.581e-02  1.007e+00   -0.075  0.94001
## household.income[25K-35K]                -1.238e+00  9.540e-01   -1.298  0.19446
## household.income[35K-50K]                -3.491e-01  9.121e-01   -0.383  0.70193
## household.income[50K-75K]                -1.076e+00  9.128e-01   -1.179  0.23869
## household.income[5K-12K]                 -1.074e-01  1.056e+00   -0.102  0.91901
## household.income[75K-100K]               -1.384e+00  9.146e-01   -1.513  0.13037
## high.educBachelor                        -2.912e-01  8.548e-01   -0.341  0.73339
## high.educHS Diploma/GED                  -1.090e+00  8.727e-01   -1.250  0.21165
## high.educPost Graduate Degree             1.736e-02  8.632e-01    0.020  0.98396
## high.educSome College                    -5.618e-02  8.080e-01   -0.070  0.94458
## hormone_scr_ert_mean:caudate_rvsn_ant_z   2.129e-03  8.151e-03    0.261  0.79401
##
## (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) =  0.026
## lmer.REML =  10489  Scale est. = 11.076    n = 1712
```

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)                              2.606e+00  2.525e+00   1.032  0.30209
## PDS_score                                7.140e-01  2.592e-01   2.755  0.00594
## hormone_sal_end_min_since_midnight       3.149e-04  7.535e-04   0.418  0.67599
## hormone_scr_ert_mean                    -6.337e-03  6.655e-03  -0.952  0.34115
## caudate_rvsn_ant_z                       1.776e-01  1.840e-01   0.965  0.33466
## race.ethnicity.5levelBlack              -5.536e-02  9.733e-01  -0.057  0.95464
## race.ethnicity.5levelMixed               2.248e+00  9.378e-01   2.397  0.01664
## race.ethnicity.5levelOther               1.739e+00  1.088e+00   1.598  0.11021
## race.ethnicity.5levelWhite               1.635e+00  8.812e-01   1.856  0.06368
## demo_race_hispanic1                     -4.952e-01  3.752e-01  -1.320  0.18704
## interview_age                           -6.657e-03  1.672e-02  -0.398  0.69064
## MRI_minus_hormone_date_time             -1.071e-05  1.466e-05  -0.731  0.46503
## bmi                                      5.034e-02  3.671e-02   1.371  0.17051
## household.income[>=200K]                -1.280e+00  1.012e+00  -1.265  0.20612
## household.income[100K-200K]             -8.799e-01  9.572e-01  -0.919  0.35810
## household.income[12K-16K]               -3.358e-01  1.239e+00  -0.271  0.78636
## household.income[16K-25K]                1.328e+00  1.040e+00   1.277  0.20171
## household.income[25K-35K]                3.061e-01  1.013e+00   0.302  0.76248
## household.income[35K-50K]                6.801e-01  9.814e-01   0.693  0.48837
## household.income[50K-75K]               -1.579e-01  9.563e-01  -0.165  0.86889
## household.income[5K-12K]                 1.879e+00  1.089e+00   1.726  0.08462
## household.income[75K-100K]              -5.746e-01  9.690e-01  -0.593  0.55329
## high.educBachelor                        2.113e-01  8.375e-01   0.252  0.80088
## high.educHS Diploma/GED                 -1.106e+00  8.628e-01  -1.282  0.20008
## high.educPost Graduate Degree           -7.741e-02  8.480e-01  -0.091  0.92727
## high.educSome College                    2.745e-01  7.987e-01   0.344  0.73114
## hormone_scr_ert_mean:caudate_rvsn_ant_z -6.016e-03  3.817e-03  -1.576  0.11519
##
## (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) =  0.0256
## lmer.REML =  10529  Scale est. = 15.488    n = 1729
```

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)                        4.771e+00  2.536e+00   1.882  0.06006
## PDS_score                          6.339e-01  2.039e-01   3.108  0.00191
## hormone_sal_end_min_since_midnight -8.205e-04  7.728e-04  -1.062  0.28853
## hormone_scr_ert_mean               -6.138e-03  8.100e-03  -0.758  0.44867
```

```
## putamen_rvsn_ant_z                        -1.843e-01  3.322e-01  -0.555  0.57909
## race.ethnicity.5levelBlack                 -9.684e-02  9.838e-01  -0.098  0.92160
## race.ethnicity.5levelMixed                  1.905e+00  9.389e-01   2.029  0.04264
## race.ethnicity.5levelOther                  1.756e+00  1.063e+00   1.652  0.09878
## race.ethnicity.5levelWhite                  1.432e+00  8.834e-01   1.622  0.10508
## demo_race_hispanic1                         1.295e-01  3.879e-01   0.334  0.73861
## interview_age                              -9.287e-03  1.743e-02  -0.533  0.59433
## MRI_minus_hormone_date_time                -6.999e-06  1.632e-05  -0.429  0.66810
## bmi                                         6.713e-02  3.454e-02   1.944  0.05212
## household.income[>=200K]                   -2.412e+00  9.573e-01  -2.520  0.01184
## household.income[100K-200K]                -1.896e+00  9.005e-01  -2.106  0.03538
## household.income[12K-16K]                   7.134e-02  1.175e+00   0.061  0.95160
## household.income[16K-25K]                  -1.611e-01  1.007e+00  -0.160  0.87290
## household.income[25K-35K]                  -1.291e+00  9.509e-01  -1.358  0.17462
## household.income[35K-50K]                  -3.764e-01  9.089e-01  -0.414  0.67885
## household.income[50K-75K]                  -1.061e+00  9.110e-01  -1.165  0.24429
## household.income[5K-12K]                   -1.276e-01  1.054e+00  -0.121  0.90368
## household.income[75K-100K]                 -1.519e+00  9.127e-01  -1.665  0.09614
## high.educBachelor                          -2.773e-01  8.498e-01  -0.326  0.74426
## high.educHS Diploma/GED                    -1.104e+00  8.676e-01  -1.272  0.20354
## high.educPost Graduate Degree              -6.702e-03  8.584e-01  -0.008  0.99377
## high.educSome College                      -7.379e-02  8.029e-01  -0.092  0.92679
## hormone_scr_ert_mean:putamen_rvsn_ant_z     8.043e-03  8.661e-03   0.929  0.35322
##
## (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) =  0.0262
## lmer.REML =  10452  Scale est. = 11.006    n = 1708
```

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)                         2.416e+00  2.528e+00   0.956  0.33939
## PDS_score                           7.397e-01  2.597e-01   2.848  0.00446
## hormone_sal_end_min_since_midnight  4.229e-04  7.514e-04   0.563  0.57360
## hormone_scr_ert_mean               -8.172e-03  6.528e-03  -1.252  0.21079
## putamen_rvsn_ant_z                  2.539e-01  2.043e-01   1.243  0.21416
## race.ethnicity.5levelBlack         -2.943e-02  9.722e-01  -0.030  0.97585
## race.ethnicity.5levelMixed          2.261e+00  9.342e-01   2.420  0.01562
## race.ethnicity.5levelOther          1.721e+00  1.087e+00   1.584  0.11340
## race.ethnicity.5levelWhite          1.626e+00  8.798e-01   1.848  0.06472
## demo_race_hispanic1                -5.366e-01  3.740e-01  -1.435  0.15152
## interview_age                      -5.552e-03  1.672e-02  -0.332  0.73983
## MRI_minus_hormone_date_time        -1.038e-05  1.426e-05  -0.728  0.46668
## bmi                                 5.632e-02  3.685e-02   1.528  0.12662
## household.income[>=200K]           -1.287e+00  1.017e+00  -1.266  0.20556
## household.income[100K-200K]        -9.152e-01  9.635e-01  -0.950  0.34233
## household.income[12K-16K]          -3.865e-01  1.241e+00  -0.311  0.75559
## household.income[16K-25K]           1.293e+00  1.045e+00   1.237  0.21612
## household.income[25K-35K]           2.944e-01  1.017e+00   0.289  0.77239
## household.income[35K-50K]           6.947e-01  9.873e-01   0.704  0.48178
## household.income[50K-75K]          -1.302e-01  9.630e-01  -0.135  0.89247
## household.income[5K-12K]            1.805e+00  1.095e+00   1.648  0.09949
## household.income[75K-100K]         -6.055e-01  9.750e-01  -0.621  0.53465
## high.educBachelor                   1.112e-01  8.401e-01   0.132  0.89468
## high.educHS Diploma/GED            -1.204e+00  8.666e-01  -1.390  0.16475
## high.educPost Graduate Degree      -1.233e-01  8.506e-01  -0.145  0.88481
## high.educSome College               1.934e-01  8.022e-01   0.241  0.80957
## hormone_scr_ert_mean:putamen_rvsn_ant_z -9.641e-03  4.642e-03  -2.077  0.03796
##
## (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) =  0.0272
## lmer.REML =  10533  Scale est. = 15.147    n = 1731
```

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)                                4.823e+00  2.536e+00
## PDS_score                                  6.132e-01  2.035e-01
## hormone_sal_end_min_since_midnight        -9.444e-04  7.760e-04
```

```
## hormone_scr_ert_mean                                         -3.432e-03  8.078e-03
## accumbens_posvsneg_feedback_z                                 -9.782e-02  4.356e-01
## race.ethnicity.5levelBlack                                    -1.479e-01  9.867e-01
## race.ethnicity.5levelMixed                                     1.849e+00  9.419e-01
## race.ethnicity.5levelOther                                     1.714e+00  1.063e+00
## race.ethnicity.5levelWhite                                     1.441e+00  8.871e-01
## demo_race_hispanic1                                            1.031e-01  3.896e-01
## interview_age                                                 -1.028e-02  1.745e-02
## MRI_minus_hormone_date_time                                   -1.059e-05  1.617e-05
## bmi                                                            6.704e-02  3.458e-02
## household.income[>=200K]                                      -2.422e+00  9.548e-01
## household.income[100K-200K]                                   -1.829e+00  8.967e-01
## household.income[12K-16K]                                      1.957e-01  1.165e+00
## household.income[16K-25K]                                     -7.280e-03  1.001e+00
## household.income[25K-35K]                                     -1.195e+00  9.465e-01
## household.income[35K-50K]                                     -2.774e-01  9.048e-01
## household.income[50K-75K]                                     -1.104e+00  9.061e-01
## household.income[5K-12K]                                      -2.401e-02  1.050e+00
## household.income[75K-100K]                                    -1.359e+00  9.077e-01
## high.educBachelor                                             -2.335e-01  8.512e-01
## high.educHS Diploma/GED                                       -1.015e+00  8.659e-01
## high.educPost Graduate Degree                                  6.910e-02  8.597e-01
## high.educSome College                                         -3.016e-02  8.040e-01
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z             3.086e-03  1.085e-02
##                                                                t value Pr(>|t|)
## (Intercept)                                                      1.901  0.05743 .
## PDS_score                                                        3.014  0.00262 **
## hormone_sal_end_min_since_midnight                              -1.217  0.22376
## hormone_scr_ert_mean                                            -0.425  0.67098
## accumbens_posvsneg_feedback_z                                   -0.225  0.82234
## race.ethnicity.5levelBlack                                      -0.150  0.88083
## race.ethnicity.5levelMixed                                       1.963  0.04982 *
## race.ethnicity.5levelOther                                       1.612  0.10723
## race.ethnicity.5levelWhite                                       1.624  0.10451
## demo_race_hispanic1                                              0.265  0.79124
## interview_age                                                   -0.589  0.55575
## MRI_minus_hormone_date_time                                     -0.655  0.51268
## bmi                                                              1.939  0.05270 .
## household.income[>=200K]                                        -2.536  0.01130 *
## household.income[100K-200K]                                     -2.040  0.04152 *
## household.income[12K-16K]                                        0.168  0.86663
## household.income[16K-25K]                                       -0.007  0.99420
## household.income[25K-35K]                                       -1.263  0.20686
## household.income[35K-50K]                                       -0.307  0.75922
## household.income[50K-75K]                                       -1.218  0.22328
## household.income[5K-12K]                                        -0.023  0.98176
## household.income[75K-100K]                                      -1.497  0.13446
## high.educBachelor                                               -0.274  0.78384
## high.educHS Diploma/GED                                         -1.172  0.24117
## high.educPost Graduate Degree                                    0.080  0.93594
## high.educSome College                                           -0.038  0.97009
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z               0.284  0.77611
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) =  0.0257
## lmer.REML =  10513  Scale est. = 10.915     n = 1717
```

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)                                     1.596e+00  2.502e+00
## PDS_score                                       6.436e-01  2.563e-01
## hormone_sal_end_min_since_midnight              4.846e-04  7.466e-04
## hormone_scr_ert_mean                           -5.244e-04  5.355e-03
## accumbens_posvsneg_feedback_z                   2.151e-01  3.388e-01
## race.ethnicity.5levelBlack                      2.118e-01  9.546e-01
## race.ethnicity.5levelMixed                      2.400e+00  9.169e-01
## race.ethnicity.5levelOther                      1.970e+00  1.069e+00
## race.ethnicity.5levelWhite                      1.739e+00  8.601e-01
## demo_race_hispanic1                            -4.665e-01  3.715e-01
## interview_age                                  -3.797e-03  1.655e-02
## MRI_minus_hormone_date_time                    -1.087e-05  1.416e-05
## bmi                                             4.805e-02  3.625e-02
## household.income[>=200K]                       -1.396e+00  1.002e+00
## household.income[100K-200K]                    -1.028e+00  9.469e-01
## household.income[12K-16K]                      -4.186e-01  1.226e+00
## household.income[16K-25K]                       1.296e+00  1.030e+00
## household.income[25K-35K]                       2.014e-01  1.002e+00
## household.income[35K-50K]                       4.740e-01  9.712e-01
## household.income[50K-75K]                      -2.407e-01  9.461e-01
## household.income[5K-12K]                        1.074e+00  1.082e+00
## household.income[75K-100K]                     -6.983e-01  9.583e-01
## high.educBachelor                               6.786e-01  8.378e-01
## high.educHS Diploma/GED                        -6.373e-01  8.599e-01
## high.educPost Graduate Degree                   4.305e-01  8.493e-01
## high.educSome College                           6.476e-01  7.988e-01
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z 3.273e-03  9.123e-03
##                                                 t value Pr(>|t|)
## (Intercept)                                      0.638  0.52380
## PDS_score                                        2.511  0.01213 *
## hormone_sal_end_min_since_midnight               0.649  0.51636
```

```
## hormone_scr_ert_mean                                         -0.098  0.92200
## accumbens_posvsneg_feedback_z                                  0.635  0.52552
## race.ethnicity.5levelBlack                                     0.222  0.82441
## race.ethnicity.5levelMixed                                     2.618  0.00894 **
## race.ethnicity.5levelOther                                     1.843  0.06555 .
## race.ethnicity.5levelWhite                                     2.021  0.04340 *
## demo_race_hispanic1                                           -1.256  0.20940
## interview_age                                                 -0.229  0.81859
## MRI_minus_hormone_date_time                                   -0.767  0.44293
## bmi                                                            1.325  0.18520
## household.income[>=200K]                                      -1.394  0.16351
## household.income[100K-200K]                                   -1.086  0.27764
## household.income[12K-16K]                                     -0.342  0.73275
## household.income[16K-25K]                                      1.258  0.20859
## household.income[25K-35K]                                      0.201  0.84071
## household.income[35K-50K]                                      0.488  0.62560
## household.income[50K-75K]                                     -0.254  0.79919
## household.income[5K-12K]                                       0.993  0.32087
## household.income[75K-100K]                                    -0.729  0.46632
## high.educBachelor                                              0.810  0.41803
## high.educHS Diploma/GED                                       -0.741  0.45872
## high.educPost Graduate Degree                                  0.507  0.61226
## high.educSome College                                          0.811  0.41760
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z             0.359  0.71985
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0228
## lmer.REML =  10480  Scale est. = 15.896    n = 1727
```

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)                          5.005e+00  2.550e+00   1.963
## PDS_score                            6.332e-01  2.036e-01   3.111
```

```
## hormone_sal_end_min_since_midnight                      -9.975e-04  7.767e-04  -1.284
## hormone_scr_ert_mean                                    -4.577e-03  8.071e-03  -0.567
## caudate_posvsneg_feedback_z                             -3.221e-01  3.279e-01  -0.982
## race.ethnicity.5levelBlack                              -1.162e-01  9.872e-01  -0.118
## race.ethnicity.5levelMixed                               1.819e+00  9.415e-01   1.932
## race.ethnicity.5levelOther                               1.700e+00  1.062e+00   1.600
## race.ethnicity.5levelWhite                               1.401e+00  8.863e-01   1.580
## demo_race_hispanic1                                      1.311e-01  3.917e-01   0.335
## interview_age                                           -1.177e-02  1.752e-02  -0.672
## MRI_minus_hormone_date_time                             -9.855e-06  1.610e-05  -0.612
## bmi                                                      6.844e-02  3.458e-02   1.979
## household.income[>=200K]                                -2.302e+00  9.543e-01  -2.412
## household.income[100K-200K]                             -1.798e+00  8.976e-01  -2.003
## household.income[12K-16K]                                2.103e-01  1.166e+00   0.180
## household.income[16K-25K]                                2.413e-02  1.005e+00   0.024
## household.income[25K-35K]                               -1.206e+00  9.489e-01  -1.271
## household.income[35K-50K]                               -2.525e-01  9.056e-01  -0.279
## household.income[50K-75K]                               -1.049e+00  9.084e-01  -1.154
## household.income[5K-12K]                                -6.013e-02  1.057e+00  -0.057
## household.income[75K-100K]                              -1.350e+00  9.087e-01  -1.486
## high.educBachelor                                       -2.292e-01  8.497e-01  -0.270
## high.educHS Diploma/GED                                 -1.096e+00  8.682e-01  -1.262
## high.educPost Graduate Degree                            6.331e-02  8.583e-01   0.074
## high.educSome College                                   -4.378e-02  8.037e-01  -0.054
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z         3.830e-03  8.402e-03   0.456
##                                                         Pr(>|t|)
## (Intercept)                                              0.0498 *
## PDS_score                                                0.0019 **
## hormone_sal_end_min_since_midnight                       0.1992
## hormone_scr_ert_mean                                     0.5707
## caudate_posvsneg_feedback_z                              0.3261
## race.ethnicity.5levelBlack                               0.9063
## race.ethnicity.5levelMixed                               0.0536 .
## race.ethnicity.5levelOther                               0.1097
## race.ethnicity.5levelWhite                               0.1142
## demo_race_hispanic1                                      0.7378
## interview_age                                            0.5018
## MRI_minus_hormone_date_time                              0.5404
## bmi                                                      0.0479 *
## household.income[>=200K]                                 0.0160 *
## household.income[100K-200K]                              0.0453 *
## household.income[12K-16K]                                0.8569
## household.income[16K-25K]                                0.9809
## household.income[25K-35K]                                0.2038
## household.income[35K-50K]                                0.7804
## household.income[50K-75K]                                0.2485
## household.income[5K-12K]                                 0.9546
## household.income[75K-100K]                               0.1375
## high.educBachelor                                        0.7874
## high.educHS Diploma/GED                                  0.2070
## high.educPost Graduate Degree                            0.9412
## high.educSome College                                    0.9566
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z         0.6485
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0268
## lmer.REML =  10483  Scale est. = 10.963    n = 1712
```

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)                                    2.878e+00  2.537e+00   1.135
## PDS_score                                      7.267e-01  2.594e-01   2.801
## hormone_sal_end_min_since_midnight             5.422e-04  7.553e-04   0.718
## hormone_scr_ert_mean                           2.079e-04  5.368e-03   0.039
## caudate_posvsneg_feedback_z                    4.259e-02  2.464e-01   0.173
## race.ethnicity.5levelBlack                     2.807e-02  9.725e-01   0.029
## race.ethnicity.5levelMixed                     2.284e+00  9.364e-01   2.439
## race.ethnicity.5levelOther                     1.832e+00  1.087e+00   1.685
## race.ethnicity.5levelWhite                     1.704e+00  8.799e-01   1.937
## demo_race_hispanic1                           -4.397e-01  3.733e-01  -1.178
## interview_age                                 -1.346e-02  1.667e-02  -0.807
## MRI_minus_hormone_date_time                   -1.444e-05  1.436e-05  -1.005
## bmi                                            5.267e-02  3.668e-02   1.436
## household.income[>=200K]                      -1.208e+00  1.019e+00  -1.186
## household.income[100K-200K]                   -8.239e-01  9.631e-01  -0.855
## household.income[12K-16K]                     -4.462e-01  1.253e+00  -0.356
## household.income[16K-25K]                      1.411e+00  1.045e+00   1.351
## household.income[25K-35K]                      9.804e-02  1.020e+00   0.096
## household.income[35K-50K]                      7.035e-01  9.873e-01   0.713
## household.income[50K-75K]                     -4.555e-02  9.620e-01  -0.047
## household.income[5K-12K]                       1.834e+00  1.096e+00   1.673
## household.income[75K-100K]                    -5.556e-01  9.750e-01  -0.570
## high.educBachelor                              1.755e-01  8.450e-01   0.208
## high.educHS Diploma/GED                       -1.136e+00  8.691e-01  -1.307
## high.educPost Graduate Degree                 -9.356e-02  8.564e-01  -0.109
## high.educSome College                          2.604e-01  8.054e-01   0.323
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z  2.701e-03  6.169e-03   0.438
##                                                Pr(>|t|)
## (Intercept)                                     0.25670
## PDS_score                                       0.00515 **
```

```
## hormone_sal_end_min_since_midnight            0.47298
## hormone_scr_ert_mean                          0.96911
## caudate_posvsneg_feedback_z                    0.86280
## race.ethnicity.5levelBlack                     0.97697
## race.ethnicity.5levelMixed                     0.01481 *
## race.ethnicity.5levelOther                     0.09208 .
## race.ethnicity.5levelWhite                     0.05296 .
## demo_race_hispanic1                            0.23898
## interview_age                                  0.41953
## MRI_minus_hormone_date_time                    0.31487
## bmi                                            0.15118
## household.income[>=200K]                       0.23577
## household.income[100K-200K]                    0.39241
## household.income[12K-16K]                      0.72175
## household.income[16K-25K]                      0.17697
## household.income[25K-35K]                      0.92343
## household.income[35K-50K]                      0.47621
## household.income[50K-75K]                      0.96224
## household.income[5K-12K]                       0.09444 .
## household.income[75K-100K]                     0.56884
## high.educBachelor                              0.83547
## high.educHS Diploma/GED                        0.19132
## high.educPost Graduate Degree                  0.91302
## high.educSome College                          0.74649
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.66151
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0255
## lmer.REML =  10525  Scale est. = 15.622    n = 1729
```

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)                             4.749e+00  2.543e+00   1.868
```

```
## PDS_score                                              6.180e-01  2.034e-01   3.038
## hormone_sal_end_min_since_midnight                    -1.045e-03  7.784e-04  -1.343
## hormone_scr_ert_mean                                  -3.965e-03  8.097e-03  -0.490
## putamen_posvsneg_feedback_z                           -1.922e-01  3.620e-01  -0.531
## race.ethnicity.5levelBlack                            -3.292e-02  9.888e-01  -0.033
## race.ethnicity.5levelMixed                             1.865e+00  9.411e-01   1.982
## race.ethnicity.5levelOther                             1.778e+00  1.064e+00   1.671
## race.ethnicity.5levelWhite                             1.436e+00  8.863e-01   1.620
## demo_race_hispanic1                                    1.464e-01  3.913e-01   0.374
## interview_age                                         -1.028e-02  1.748e-02  -0.588
## MRI_minus_hormone_date_time                           -7.430e-06  1.625e-05  -0.457
## bmi                                                    6.842e-02  3.462e-02   1.976
## household.income[>=200K]                              -2.290e+00  9.545e-01  -2.399
## household.income[100K-200K]                           -1.782e+00  8.982e-01  -1.984
## household.income[12K-16K]                              2.160e-01  1.166e+00   0.185
## household.income[16K-25K]                              6.140e-03  1.002e+00   0.006
## household.income[25K-35K]                             -1.150e+00  9.485e-01  -1.213
## household.income[35K-50K]                             -2.411e-01  9.055e-01  -0.266
## household.income[50K-75K]                             -1.011e+00  9.097e-01  -1.111
## household.income[5K-12K]                              -1.029e-01  1.059e+00  -0.097
## household.income[75K-100K]                            -1.328e+00  9.091e-01  -1.461
## high.educBachelor                                     -1.843e-01  8.506e-01  -0.217
## high.educHS Diploma/GED                               -1.001e+00  8.697e-01  -1.151
## high.educPost Graduate Degree                          1.134e-01  8.588e-01   0.132
## high.educSome College                                  1.176e-02  8.041e-01   0.015
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z       6.324e-04  9.209e-03   0.069
##                                                       Pr(>|t|)
## (Intercept)                                            0.06197 .
## PDS_score                                              0.00242 **
## hormone_sal_end_min_since_midnight                     0.17940
## hormone_scr_ert_mean                                   0.62438
## putamen_posvsneg_feedback_z                            0.59549
## race.ethnicity.5levelBlack                             0.97344
## race.ethnicity.5levelMixed                             0.04769 *
## race.ethnicity.5levelOther                             0.09491 .
## race.ethnicity.5levelWhite                             0.10533
## demo_race_hispanic1                                    0.70837
## interview_age                                          0.55667
## MRI_minus_hormone_date_time                            0.64762
## bmi                                                    0.04828 *
## household.income[>=200K]                               0.01655 *
## household.income[100K-200K]                            0.04746 *
## household.income[12K-16K]                              0.85299
## household.income[16K-25K]                              0.99511
## household.income[25K-35K]                              0.22548
## household.income[35K-50K]                              0.79004
## household.income[50K-75K]                              0.26666
## household.income[5K-12K]                               0.92260
## household.income[75K-100K]                             0.14430
## high.educBachelor                                      0.82845
## high.educHS Diploma/GED                                0.24998
## high.educPost Graduate Degree                          0.89493
## high.educSome College                                  0.98833
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z       0.94526
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0261
## lmer.REML =  10476  Scale est. = 10.959    n = 1711
```

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)                                      2.311e+00  2.531e+00   0.913
## PDS_score                                        7.031e-01  2.591e-01   2.713
## hormone_sal_end_min_since_midnight               4.356e-04  7.553e-04   0.577
## hormone_scr_ert_mean                            -2.739e-04  5.471e-03  -0.050
## putamen_posvsneg_feedback_z                      3.323e-01  3.000e-01   1.108
## race.ethnicity.5levelBlack                       7.579e-02  9.652e-01   0.079
## race.ethnicity.5levelMixed                       2.353e+00  9.279e-01   2.536
## race.ethnicity.5levelOther                       1.898e+00  1.081e+00   1.756
## race.ethnicity.5levelWhite                       1.781e+00  8.712e-01   2.044
## demo_race_hispanic1                             -5.043e-01  3.759e-01  -1.342
## interview_age                                   -9.150e-03  1.672e-02  -0.547
## MRI_minus_hormone_date_time                     -1.148e-05  1.440e-05  -0.798
## bmi                                              5.805e-02  3.674e-02   1.580
## household.income[>=200K]                        -1.324e+00  1.011e+00  -1.309
## household.income[100K-200K]                     -9.226e-01  9.573e-01  -0.964
## household.income[12K-16K]                       -3.278e-01  1.244e+00  -0.264
## household.income[16K-25K]                        1.310e+00  1.038e+00   1.262
## household.income[25K-35K]                        2.735e-01  1.015e+00   0.270
## household.income[35K-50K]                        5.695e-01  9.829e-01   0.579
## household.income[50K-75K]                       -1.458e-01  9.566e-01  -0.152
## household.income[5K-12K]                         1.720e+00  1.088e+00   1.582
## household.income[75K-100K]                      -6.489e-01  9.694e-01  -0.669
## high.educBachelor                                2.902e-01  8.331e-01   0.348
## high.educHS Diploma/GED                         -1.055e+00  8.604e-01  -1.227
## high.educPost Graduate Degree                    2.584e-02  8.439e-01   0.031
## high.educSome College                            2.948e-01  7.943e-01   0.371
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -5.664e-03  8.071e-03  -0.702
##                                                  Pr(>|t|)
## (Intercept)                                       0.36116
```

```
## PDS_score                                          0.00673 **
## hormone_sal_end_min_since_midnight                 0.56424
## hormone_scr_ert_mean                               0.96007
## putamen_posvsneg_feedback_z                        0.26811
## race.ethnicity.5levelBlack                         0.93742
## race.ethnicity.5levelMixed                         0.01130 *
## race.ethnicity.5levelOther                         0.07930 .
## race.ethnicity.5levelWhite                         0.04109 *
## demo_race_hispanic1                                0.17989
## interview_age                                      0.58429
## MRI_minus_hormone_date_time                        0.42524
## bmi                                                0.11428
## household.income[>=200K]                           0.19077
## household.income[100K-200K]                        0.33526
## household.income[12K-16K]                          0.79214
## household.income[16K-25K]                          0.20705
## household.income[25K-35K]                          0.78753
## household.income[35K-50K]                          0.56239
## household.income[50K-75K]                          0.87884
## household.income[5K-12K]                           0.11391
## household.income[75K-100K]                         0.50334
## high.educBachelor                                  0.72761
## high.educHS Diploma/GED                            0.22009
## high.educPost Graduate Degree                      0.97558
## high.educSome College                              0.71060
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z   0.48291
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0245
## lmer.REML =  10585  Scale est. = 15.715    n = 1737
```

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)                               4.969e+00  2.556e+00   1.944  0.05206 .
## PDS_score                                 6.129e-01  2.044e-01   2.999  0.00275 **
## hormone_sal_end_min_since_midnight       -8.807e-04  7.790e-04  -1.131  0.25843
## hormone_scr_ert_mean                     -4.087e-03  8.122e-03  -0.503  0.61492
## lOFC_rvsn_ant_z                           1.667e-01  4.886e-01   0.341  0.73300
## race.ethnicity.5levelBlack               -2.471e-01  9.993e-01  -0.247  0.80472
## race.ethnicity.5levelMixed                1.750e+00  9.566e-01   1.829  0.06757 .
## race.ethnicity.5levelOther                1.623e+00  1.079e+00   1.504  0.13287
## race.ethnicity.5levelWhite                1.330e+00  9.000e-01   1.478  0.13960
## demo_race_hispanic1                       8.829e-02  3.906e-01   0.226  0.82120
## interview_age                            -1.193e-02  1.761e-02  -0.677  0.49821
## MRI_minus_hormone_date_time              -9.169e-06  1.622e-05  -0.565  0.57205
## bmi                                       6.980e-02  3.481e-02   2.005  0.04510 *
## household.income[>=200K]                 -2.332e+00  9.562e-01  -2.439  0.01484 *
## household.income[100K-200K]              -1.790e+00  9.001e-01  -1.989  0.04691 *
## household.income[12K-16K]                 1.713e-01  1.167e+00   0.147  0.88335
## household.income[16K-25K]                 3.211e-02  1.004e+00   0.032  0.97450
## household.income[25K-35K]                -1.140e+00  9.527e-01  -1.197  0.23147
## household.income[35K-50K]                -1.862e-01  9.104e-01  -0.205  0.83796
## household.income[50K-75K]                -1.029e+00  9.089e-01  -1.133  0.25752
## household.income[5K-12K]                  2.007e-02  1.056e+00   0.019  0.98484
## household.income[75K-100K]               -1.322e+00  9.107e-01  -1.452  0.14680
## high.educBachelor                        -1.998e-01  8.508e-01  -0.235  0.81436
## high.educHS Diploma/GED                  -1.020e+00  8.672e-01  -1.176  0.23985
## high.educPost Graduate Degree             9.708e-02  8.591e-01   0.113  0.91004
## high.educSome College                     3.962e-02  8.046e-01   0.049  0.96073
## hormone_scr_ert_mean:lOFC_rvsn_ant_z      7.246e-04  1.268e-02   0.057  0.95443
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0264
## lmer.REML =  10473  Scale est. = 11.449    n = 1709
```

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)                    9.932e-01  2.511e+00   0.396   0.6925
## PDS_score                      6.040e-01  2.587e-01   2.335   0.0197 *
```

```
## hormone_sal_end_min_since_midnight     4.363e-04  7.423e-04   0.588   0.5568
## hormone_scr_ert_mean                   -4.438e-03  5.844e-03  -0.759   0.4477
## lOFC_rvsn_ant_z                         4.024e-01  3.467e-01   1.161   0.2460
## race.ethnicity.5levelBlack              1.136e-01  9.517e-01   0.119   0.9050
## race.ethnicity.5levelMixed              2.258e+00  9.148e-01   2.469   0.0137 *
## race.ethnicity.5levelOther              1.844e+00  1.065e+00   1.731   0.0836 .
## race.ethnicity.5levelWhite              1.633e+00  8.575e-01   1.904   0.0570 .
## demo_race_hispanic1                    -5.500e-01  3.693e-01  -1.489   0.1366
## interview_age                           3.098e-03  1.655e-02   0.187   0.8516
## MRI_minus_hormone_date_time            -7.383e-06  1.408e-05  -0.524   0.6002
## bmi                                     4.595e-02  3.638e-02   1.263   0.2067
## household.income[>=200K]               -1.524e+00  1.006e+00  -1.515   0.1301
## household.income[100K-200K]            -1.118e+00  9.542e-01  -1.171   0.2416
## household.income[12K-16K]              -5.061e-01  1.230e+00  -0.411   0.6808
## household.income[16K-25K]               1.089e+00  1.039e+00   1.048   0.2948
## household.income[25K-35K]               4.184e-02  1.009e+00   0.041   0.9669
## household.income[35K-50K]               3.850e-01  9.769e-01   0.394   0.6936
## household.income[50K-75K]              -4.019e-01  9.535e-01  -0.422   0.6734
## household.income[5K-12K]                1.198e+00  1.093e+00   1.096   0.2734
## household.income[75K-100K]             -7.777e-01  9.658e-01  -0.805   0.4208
## high.educBachelor                       9.440e-01  8.402e-01   1.124   0.2613
## high.educHS Diploma/GED                -4.647e-01  8.646e-01  -0.538   0.5910
## high.educPost Graduate Degree           6.517e-01  8.503e-01   0.766   0.4435
## high.educSome College                   9.722e-01  8.029e-01   1.211   0.2261
## hormone_scr_ert_mean:lOFC_rvsn_ant_z -1.511e-02  9.292e-03  -1.626   0.1041
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0223
## lmer.REML =  10476  Scale est. = 15.093    n = 1728
```

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)                    5.006e+00  2.553e+00   1.961  0.05008 .
```

```
## PDS_score                                6.365e-01  2.044e-01   3.113  0.00188 **
## hormone_sal_end_min_since_midnight      -9.251e-04  7.767e-04  -1.191  0.23378
## hormone_scr_ert_mean                    -4.706e-03  8.121e-03  -0.579  0.56237
## mOFC_rvsn_ant_z                          3.729e-02  4.173e-01   0.089  0.92881
## race.ethnicity.5levelBlack              -2.490e-01  1.000e+00  -0.249  0.80341
## race.ethnicity.5levelMixed               1.778e+00  9.571e-01   1.858  0.06338 .
## race.ethnicity.5levelOther               1.615e+00  1.080e+00   1.495  0.13502
## race.ethnicity.5levelWhite               1.364e+00  9.007e-01   1.515  0.13008
## demo_race_hispanic1                      9.395e-02  3.909e-01   0.240  0.81008
## interview_age                           -1.056e-02  1.756e-02  -0.601  0.54772
## MRI_minus_hormone_date_time             -9.195e-06  1.622e-05  -0.567  0.57085
## bmi                                      6.396e-02  3.468e-02   1.844  0.06533 .
## household.income[>=200K]                -2.357e+00  9.579e-01  -2.460  0.01399 *
## household.income[100K-200K]             -1.832e+00  9.010e-01  -2.034  0.04214 *
## household.income[12K-16K]                1.672e-01  1.169e+00   0.143  0.88626
## household.income[16K-25K]                6.040e-03  1.006e+00   0.006  0.99521
## household.income[25K-35K]               -1.118e+00  9.541e-01  -1.172  0.24136
## household.income[35K-50K]               -2.241e-01  9.111e-01  -0.246  0.80574
## household.income[50K-75K]               -1.052e+00  9.097e-01  -1.157  0.24753
## household.income[5K-12K]                 1.374e-02  1.057e+00   0.013  0.98963
## household.income[75K-100K]              -1.344e+00  9.120e-01  -1.474  0.14060
## high.educBachelor                       -2.516e-01  8.583e-01  -0.293  0.76947
## high.educHS Diploma/GED                 -1.063e+00  8.727e-01  -1.218  0.22358
## high.educPost Graduate Degree            3.145e-02  8.667e-01   0.036  0.97106
## high.educSome College                   -4.493e-02  8.119e-01  -0.055  0.95587
## hormone_scr_ert_mean:mOFC_rvsn_ant_z     1.210e-03  1.061e-02   0.114  0.90921
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.026
## lmer.REML =  10468   Scale est. = 10.99      n = 1708
```

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)                        1.031e+00  2.507e+00   0.411   0.6808
## PDS_score                          6.016e-01  2.592e-01   2.321   0.0204 *
## hormone_sal_end_min_since_midnight 3.805e-04  7.505e-04   0.507   0.6122
```

```
## hormone_scr_ert_mean                      -2.926e-03  5.815e-03  -0.503   0.6149
## mOFC_rvsn_ant_z                           -5.050e-02  3.143e-01  -0.161   0.8724
## race.ethnicity.5levelBlack                 1.257e-01  9.576e-01   0.131   0.8956
## race.ethnicity.5levelMixed                 2.225e+00  9.193e-01   2.420   0.0156 *
## race.ethnicity.5levelOther                 1.802e+00  1.070e+00   1.684   0.0923 .
## race.ethnicity.5levelWhite                 1.674e+00  8.622e-01   1.942   0.0523 .
## demo_race_hispanic1                       -4.737e-01  3.717e-01  -1.274   0.2028
## interview_age                              9.558e-04  1.663e-02   0.057   0.9542
## MRI_minus_hormone_date_time               -7.830e-06  1.456e-05  -0.538   0.5907
## bmi                                        5.545e-02  3.649e-02   1.520   0.1288
## household.income[>=200K]                  -1.653e+00  1.004e+00  -1.647   0.0998 .
## household.income[100K-200K]               -1.270e+00  9.500e-01  -1.337   0.1814
## household.income[12K-16K]                 -5.616e-01  1.229e+00  -0.457   0.6477
## household.income[16K-25K]                  9.761e-01  1.034e+00   0.944   0.3455
## household.income[25K-35K]                 -2.943e-02  1.008e+00  -0.029   0.9767
## household.income[35K-50K]                  2.574e-01  9.733e-01   0.264   0.7914
## household.income[50K-75K]                 -4.641e-01  9.501e-01  -0.488   0.6253
## household.income[5K-12K]                   1.289e+00  1.099e+00   1.174   0.2406
## household.income[75K-100K]                -9.695e-01  9.637e-01  -1.006   0.3146
## high.educBachelor                          1.093e+00  8.403e-01   1.300   0.1938
## high.educHS Diploma/GED                   -3.809e-01  8.664e-01  -0.440   0.6603
## high.educPost Graduate Degree              8.225e-01  8.509e-01   0.967   0.3339
## high.educSome College                      1.071e+00  8.037e-01   1.332   0.1830
## hormone_scr_ert_mean:mOFC_rvsn_ant_z       5.514e-03  7.900e-03   0.698   0.4853
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0222
## lmer.REML =  10448  Scale est. = 15.099    n = 1721
```

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)                         4.513e+00  2.540e+00   1.777
## PDS_score                           6.399e-01  2.031e-01   3.150
```

```
## hormone_sal_end_min_since_midnight         -8.113e-04  7.747e-04  -1.047
## hormone_scr_ert_mean                        -5.338e-03  8.057e-03  -0.663
## lOFC_posvsneg_feedback_z                    -1.231e-01  5.975e-01  -0.206
## race.ethnicity.5levelBlack                  -1.009e-01  9.856e-01  -0.102
## race.ethnicity.5levelMixed                   1.818e+00  9.407e-01   1.933
## race.ethnicity.5levelOther                   1.980e+00  1.070e+00   1.851
## race.ethnicity.5levelWhite                   1.445e+00  8.848e-01   1.633
## demo_race_hispanic1                         -2.219e-02  3.893e-01  -0.057
## interview_age                               -1.067e-02  1.746e-02  -0.611
## MRI_minus_hormone_date_time                 -9.423e-06  1.612e-05  -0.585
## bmi                                          6.748e-02  3.450e-02   1.956
## household.income[>=200K]                    -2.015e+00  9.689e-01  -2.080
## household.income[100K-200K]                 -1.474e+00  9.132e-01  -1.614
## household.income[12K-16K]                    4.982e-01  1.178e+00   0.423
## household.income[16K-25K]                    3.437e-01  1.019e+00   0.337
## household.income[25K-35K]                   -7.925e-01  9.669e-01  -0.820
## household.income[35K-50K]                    5.397e-02  9.219e-01   0.059
## household.income[50K-75K]                   -7.198e-01  9.239e-01  -0.779
## household.income[5K-12K]                     3.629e-01  1.072e+00   0.339
## household.income[75K-100K]                  -9.882e-01  9.250e-01  -1.068
## high.educBachelor                           -3.289e-01  8.524e-01  -0.386
## high.educHS Diploma/GED                     -1.282e+00  8.715e-01  -1.471
## high.educPost Graduate Degree               -8.961e-03  8.595e-01  -0.010
## high.educSome College                       -6.675e-02  8.059e-01  -0.083
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z  6.665e-04  1.623e-02   0.041
##                                              Pr(>|t|)
## (Intercept)                                  0.07582 .
## PDS_score                                    0.00166 **
## hormone_sal_end_min_since_midnight           0.29515
## hormone_scr_ert_mean                         0.50771
## lOFC_posvsneg_feedback_z                     0.83675
## race.ethnicity.5levelBlack                   0.91844
## race.ethnicity.5levelMixed                   0.05341 .
## race.ethnicity.5levelOther                   0.06438 .
## race.ethnicity.5levelWhite                   0.10262
## demo_race_hispanic1                          0.95454
## interview_age                                0.54130
## MRI_minus_hormone_date_time                  0.55890
## bmi                                          0.05063 .
## household.income[>=200K]                     0.03766 *
## household.income[100K-200K]                  0.10663
## household.income[12K-16K]                    0.67251
## household.income[16K-25K]                    0.73588
## household.income[25K-35K]                    0.41256
## household.income[35K-50K]                    0.95333
## household.income[50K-75K]                    0.43602
## household.income[5K-12K]                     0.73493
## household.income[75K-100K]                   0.28551
## high.educBachelor                            0.69967
## high.educHS Diploma/GED                      0.14135
## high.educPost Graduate Degree                0.99168
## high.educSome College                        0.93399
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z  0.96724
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0261
## lmer.REML =  10460  Scale est. = 10.983    n = 1709
```

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)                                1.429e+00  2.498e+00   0.572
## PDS_score                                  6.393e-01  2.566e-01   2.491
## hormone_sal_end_min_since_midnight         4.335e-04  7.453e-04   0.582
## hormone_scr_ert_mean                      -1.673e-03  5.691e-03  -0.294
## lOFC_posvsneg_feedback_z                   2.683e-02  3.213e-01   0.084
## race.ethnicity.5levelBlack                 1.631e-01  9.554e-01   0.171
## race.ethnicity.5levelMixed                 2.384e+00  9.173e-01   2.599
## race.ethnicity.5levelOther                 1.834e+00  1.072e+00   1.711
## race.ethnicity.5levelWhite                 1.704e+00  8.609e-01   1.979
## demo_race_hispanic1                       -5.224e-01  3.715e-01  -1.406
## interview_age                             -4.881e-03  1.650e-02  -0.296
## MRI_minus_hormone_date_time               -8.000e-06  1.415e-05  -0.565
## bmi                                        6.124e-02  3.643e-02   1.681
## household.income[>=200K]                  -1.528e+00  1.001e+00  -1.527
## household.income[100K-200K]               -1.159e+00  9.478e-01  -1.223
## household.income[12K-16K]                 -5.370e-01  1.228e+00  -0.437
## household.income[16K-25K]                  1.195e+00  1.038e+00   1.151
## household.income[25K-35K]                  1.196e-01  1.006e+00   0.119
## household.income[35K-50K]                  3.628e-01  9.720e-01   0.373
## household.income[50K-75K]                 -3.188e-01  9.473e-01  -0.337
## household.income[5K-12K]                   1.102e+00  1.081e+00   1.019
## household.income[75K-100K]                -8.195e-01  9.597e-01  -0.854
## high.educBachelor                          1.030e+00  8.331e-01   1.236
## high.educHS Diploma/GED                   -3.609e-01  8.600e-01  -0.420
## high.educPost Graduate Degree              7.418e-01  8.442e-01   0.879
## high.educSome College                      9.670e-01  7.963e-01   1.214
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z  2.468e-03  7.155e-03   0.345
##                                           Pr(>|t|)
## (Intercept)                                0.56748
## PDS_score                                  0.01283 *
```

```
## hormone_sal_end_min_since_midnight          0.56091
## hormone_scr_ert_mean                        0.76877
## lOFC_posvsneg_feedback_z                    0.93345
## race.ethnicity.5levelBlack                  0.86445
## race.ethnicity.5levelMixed                  0.00942 **
## race.ethnicity.5levelOther                  0.08724 .
## race.ethnicity.5levelWhite                  0.04797 *
## demo_race_hispanic1                         0.15979
## interview_age                               0.76743
## MRI_minus_hormone_date_time                 0.57190
## bmi                                         0.09289 .
## household.income[>=200K]                    0.12689
## household.income[100K-200K]                 0.22160
## household.income[12K-16K]                   0.66193
## household.income[16K-25K]                   0.24993
## household.income[25K-35K]                   0.90540
## household.income[35K-50K]                   0.70902
## household.income[50K-75K]                   0.73651
## household.income[5K-12K]                    0.30815
## household.income[75K-100K]                  0.39329
## high.educBachelor                           0.21652
## high.educHS Diploma/GED                     0.67476
## high.educPost Graduate Degree               0.37968
## high.educSome College                       0.22477
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z  0.73016
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0217
## lmer.REML =  10532  Scale est. = 15.096    n = 1735
```

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)                        5.095e+00  2.539e+00   2.007
```

```
## PDS_score                                          6.597e-01  2.036e-01   3.240
## hormone_sal_end_min_since_midnight               -9.882e-04  7.752e-04  -1.275
## hormone_scr_ert_mean                             -4.499e-03  8.082e-03  -0.557
## mOFC_posvsneg_feedback_z                          3.820e-03  4.477e-01   0.009
## race.ethnicity.5levelBlack                       -1.471e-01  9.876e-01  -0.149
## race.ethnicity.5levelMixed                        1.822e+00  9.417e-01   1.935
## race.ethnicity.5levelOther                        1.799e+00  1.064e+00   1.691
## race.ethnicity.5levelWhite                        1.421e+00  8.860e-01   1.604
## demo_race_hispanic1                               5.931e-02  3.896e-01   0.152
## interview_age                                    -1.320e-02  1.749e-02  -0.755
## MRI_minus_hormone_date_time                      -9.406e-06  1.612e-05  -0.584
## bmi                                               6.541e-02  3.463e-02   1.889
## household.income[>=200K]                         -2.321e+00  9.582e-01  -2.422
## household.income[100K-200K]                      -1.778e+00  9.021e-01  -1.971
## household.income[12K-16K]                        -1.094e-01  1.177e+00  -0.093
## household.income[16K-25K]                         3.844e-02  1.007e+00   0.038
## household.income[25K-35K]                        -1.042e+00  9.586e-01  -1.087
## household.income[35K-50K]                        -2.238e-01  9.102e-01  -0.246
## household.income[50K-75K]                        -1.066e+00  9.119e-01  -1.169
## household.income[5K-12K]                          7.003e-02  1.061e+00   0.066
## household.income[75K-100K]                       -1.306e+00  9.127e-01  -1.430
## high.educBachelor                                -1.655e-01  8.509e-01  -0.194
## high.educHS Diploma/GED                          -1.024e+00  8.661e-01  -1.183
## high.educPost Graduate Degree                     1.436e-01  8.577e-01   0.167
## high.educSome College                             3.079e-02  8.035e-01   0.038
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z    -3.797e-03  1.146e-02  -0.331
##                                                   Pr(>|t|)
## (Intercept)                                       0.04489 *
## PDS_score                                         0.00122 **
## hormone_sal_end_min_since_midnight                0.20256
## hormone_scr_ert_mean                              0.57783
## mOFC_posvsneg_feedback_z                          0.99319
## race.ethnicity.5levelBlack                        0.88162
## race.ethnicity.5levelMixed                        0.05321 .
## race.ethnicity.5levelOther                        0.09101 .
## race.ethnicity.5levelWhite                        0.10886
## demo_race_hispanic1                               0.87903
## interview_age                                     0.45057
## MRI_minus_hormone_date_time                       0.55957
## bmi                                               0.05908 .
## household.income[>=200K]                          0.01554 *
## household.income[100K-200K]                       0.04883 *
## household.income[12K-16K]                         0.92596
## household.income[16K-25K]                         0.96957
## household.income[25K-35K]                         0.27715
## household.income[35K-50K]                         0.80576
## household.income[50K-75K]                         0.24270
## household.income[5K-12K]                          0.94738
## household.income[75K-100K]                        0.15279
## high.educBachelor                                 0.84585
## high.educHS Diploma/GED                           0.23711
## high.educPost Graduate Degree                     0.86701
## high.educSome College                             0.96943
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z     0.74042
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0255
## lmer.REML =  10471  Scale est. = 11.111    n = 1710
```

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)                                    1.380e+00  2.499e+00   0.552
## PDS_score                                      6.404e-01  2.567e-01   2.494
## hormone_sal_end_min_since_midnight             4.423e-04  7.467e-04   0.592
## hormone_scr_ert_mean                          -1.033e-03  5.306e-03  -0.195
## mOFC_posvsneg_feedback_z                       4.675e-01  3.489e-01   1.340
## race.ethnicity.5levelBlack                     1.180e-01  9.552e-01   0.124
## race.ethnicity.5levelMixed                     2.408e+00  9.176e-01   2.625
## race.ethnicity.5levelOther                     1.818e+00  1.072e+00   1.696
## race.ethnicity.5levelWhite                     1.694e+00  8.611e-01   1.967
## demo_race_hispanic1                           -5.296e-01  3.715e-01  -1.426
## interview_age                                 -4.454e-03  1.651e-02  -0.270
## MRI_minus_hormone_date_time                   -8.752e-06  1.414e-05  -0.619
## bmi                                            6.120e-02  3.641e-02   1.681
## household.income[>=200K]                      -1.512e+00  1.001e+00  -1.510
## household.income[100K-200K]                   -1.150e+00  9.479e-01  -1.213
## household.income[12K-16K]                     -5.364e-01  1.228e+00  -0.437
## household.income[16K-25K]                      1.195e+00  1.038e+00   1.151
## household.income[25K-35K]                      1.001e-01  1.006e+00   0.100
## household.income[35K-50K]                      3.483e-01  9.721e-01   0.358
## household.income[50K-75K]                     -3.362e-01  9.472e-01  -0.355
## household.income[5K-12K]                       1.109e+00  1.080e+00   1.026
## household.income[75K-100K]                    -8.084e-01  9.598e-01  -0.842
## high.educBachelor                              1.004e+00  8.329e-01   1.205
## high.educHS Diploma/GED                       -3.839e-01  8.594e-01  -0.447
## high.educPost Graduate Degree                  7.165e-01  8.435e-01   0.850
## high.educSome College                          9.365e-01  7.960e-01   1.177
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z -5.851e-03  9.224e-03  -0.634
##                                                Pr(>|t|)
## (Intercept)                                     0.58084
```

```
## PDS_score                                          0.01272 *
## hormone_sal_end_min_since_midnight                 0.55368
## hormone_scr_ert_mean                               0.84572
## mOFC_posvsneg_feedback_z                           0.18044
## race.ethnicity.5levelBlack                         0.90172
## race.ethnicity.5levelMixed                         0.00875 **
## race.ethnicity.5levelOther                         0.09015 .
## race.ethnicity.5levelWhite                         0.04932 *
## demo_race_hispanic1                                0.15419
## interview_age                                      0.78739
## MRI_minus_hormone_date_time                        0.53603
## bmi                                                0.09295 .
## household.income[>=200K]                           0.13113
## household.income[100K-200K]                        0.22541
## household.income[12K-16K]                          0.66244
## household.income[16K-25K]                          0.24976
## household.income[25K-35K]                          0.92074
## household.income[35K-50K]                          0.72019
## household.income[50K-75K]                          0.72264
## household.income[5K-12K]                           0.30497
## household.income[75K-100K]                         0.39974
## high.educBachelor                                  0.22833
## high.educHS Diploma/GED                            0.65513
## high.educPost Graduate Degree                      0.39571
## high.educSome College                              0.23952
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z  0.52597
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0228
## lmer.REML =  10514  Scale est. = 15.127    n = 1732
```

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)                       2.2264244  2.4339330   0.915  0.36043
## PDS_score                         0.5539624  0.1793457   3.089  0.00203
## hormone_sal_end_min_since_midnight -0.0001635  0.0006833  -0.239  0.81092
## hormone_scr_ert_mean              0.0073019  0.0237668   0.307  0.75870
```

```
## bisbas_ss_basm_rr                        -0.0255792  0.1062607  -0.241  0.80979
## race.ethnicity.5levelBlack               -0.7548756  0.8729042  -0.865  0.38725
## race.ethnicity.5levelMixed                1.0067983  0.8480583   1.187  0.23528
## race.ethnicity.5levelOther                1.8781342  0.9699894   1.936  0.05296
## race.ethnicity.5levelWhite                1.2270470  0.7990595   1.536  0.12478
## demo_race_hispanic1                       -0.2713306  0.3521194  -0.771  0.44105
## interview_age                              0.0024266  0.0156020   0.156  0.87642
## bmi                                        0.0855403  0.0306578   2.790  0.00531
## household.income[>=200K]                  -1.9728013  0.8147796  -2.421  0.01555
## household.income[100K-200K]               -1.3610014  0.7598844  -1.791  0.07342
## household.income[12K-16K]                  0.4998814  1.0205516   0.490  0.62431
## household.income[16K-25K]                  1.0019979  0.8497870   1.179  0.23848
## household.income[25K-35K]                 -0.2863394  0.7984689  -0.359  0.71992
## household.income[35K-50K]                 -0.0237054  0.7682588  -0.031  0.97539
## household.income[50K-75K]                 -0.3097474  0.7655995  -0.405  0.68582
## household.income[5K-12K]                   0.4126267  0.8855226   0.466  0.64128
## household.income[75K-100K]                -0.7801572  0.7683307  -1.015  0.31003
## high.educBachelor                          0.3410992  0.7541694   0.452  0.65111
## high.educHS Diploma/GED                   -0.5986513  0.7551969  -0.793  0.42803
## high.educPost Graduate Degree              0.5715050  0.7611838   0.751  0.45285
## high.educSome College                      0.5677548  0.7109852   0.799  0.42464
## hormone_scr_ert_mean:bisbas_ss_basm_rr    -0.0016948  0.0026146  -0.648  0.51690
##
## (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) =  0.0301
```

```
## lmer.REML =  13857  Scale est. = 13.522    n = 2247
```

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)                        3.3094454  2.3464511   1.410 0.158549
## PDS_score                          0.8259002  0.2193961   3.764 0.000171
## hormone_sal_end_min_since_midnight 0.0006384  0.0006553   0.974 0.330087
## hormone_scr_ert_mean               0.0110992  0.0219035   0.507 0.612390
## bisbas_ss_basm_rr                 -0.0010839  0.0908782  -0.012 0.990485
## race.ethnicity.5levelBlack         0.3085002  0.8105438   0.381 0.703527
## race.ethnicity.5levelMixed         1.8612945  0.7888613   2.359 0.018380
## race.ethnicity.5levelOther         1.3321464  0.9333878   1.427 0.153646
## race.ethnicity.5levelWhite         1.5883854  0.7362296   2.157 0.031068
## demo_race_hispanic1               -0.4591791  0.3334788  -1.377 0.168659
## interview_age                     -0.0129147  0.0148631  -0.869 0.384982
## bmi                                0.0679764  0.0317180   2.143 0.032200
## household.income[>=200K]          -2.3574783  0.7941995  -2.968 0.003023
## household.income[100K-200K]       -2.2732935  0.7369638  -3.085 0.002061
## household.income[12K-16K]         -0.8698563  0.9951826  -0.874 0.382168
## household.income[16K-25K]          0.0038336  0.8191298   0.005 0.996266
## household.income[25K-35K]         -1.0175062  0.7981791  -1.275 0.202508
## household.income[35K-50K]         -0.6647569  0.7670617  -0.867 0.386232
## household.income[50K-75K]         -1.3572357  0.7357627  -1.845 0.065208
## household.income[5K-12K]           1.0269464  0.8610259   1.193 0.233103
## household.income[75K-100K]        -1.9139089  0.7493245  -2.554 0.010705
## high.educBachelor                  0.8169967  0.7246429   1.127 0.259665
## high.educHS Diploma/GED           -0.1983341  0.7350075  -0.270 0.787307
## high.educPost Graduate Degree      0.6888875  0.7354725   0.937 0.349027
## high.educSome College              0.8673882  0.6894447   1.258 0.208478
## hormone_scr_ert_mean:bisbas_ss_basm_rr -0.0014153  0.0024534  -0.577 0.564070
##
## (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) =  0.0242
## lmer.REML =  15148  Scale est. = 13.598    n = 2449
```

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)                           6.3885636  2.4335394   2.625
## PDS_score                             0.6546397  0.1956263   3.346
## hormone_sal_end_min_since_midnight   -0.0008651  0.0007348  -1.177
## hormone_scr_ert_mean                 -0.0075369  0.0077039  -0.978
## rt_diff_large_neutral_z               0.0588490  0.2886048   0.204
## race.ethnicity.5levelBlack           -0.1311188  0.9334778  -0.140
## race.ethnicity.5levelMixed            1.5430221  0.8993742   1.716
## race.ethnicity.5levelOther            2.0543598  1.0148839   2.024
## race.ethnicity.5levelWhite            1.4107734  0.8439755   1.672
## demo_race_hispanic1                   0.0695369  0.3767256   0.185
## interview_age                        -0.0253679  0.0167054  -1.519
## bmi                                   0.0764990  0.0332157   2.303
## household.income[>=200K]             -1.9102339  0.9059772  -2.108
```

```
## household.income[100K-200K]                             -1.3576285  0.8507826  -1.596
## household.income[12K-16K]                               -0.1317972  1.1023873  -0.120
## household.income[16K-25K]                                0.5668119  0.9565144   0.593
## household.income[25K-35K]                               -0.7514409  0.8993785  -0.836
## household.income[35K-50K]                               -0.2975048  0.8565106  -0.347
## household.income[50K-75K]                               -0.7304032  0.8614889  -0.848
## household.income[5K-12K]                                 0.1393972  1.0056429   0.139
## household.income[75K-100K]                              -0.9843606  0.8586407  -1.146
## high.educBachelor                                       -0.3998800  0.8214365  -0.487
## high.educHS Diploma/GED                                 -1.2972695  0.8388025  -1.547
## high.educPost Graduate Degree                           -0.2638125  0.8281084  -0.319
## high.educSome College                                   -0.4401415  0.7740969  -0.569
## hormone_scr_ert_mean:rt_diff_large_neutral_z             0.0011130  0.0072417   0.154
##                                                         Pr(>|t|)
## (Intercept)                                             0.008732 **
## PDS_score                                               0.000835 ***
## hormone_sal_end_min_since_midnight                      0.239207
## hormone_scr_ert_mean                                    0.328048
## rt_diff_large_neutral_z                                 0.838448
## race.ethnicity.5levelBlack                              0.888310
## race.ethnicity.5levelMixed                              0.086393 .
## race.ethnicity.5levelOther                              0.043091 *
## race.ethnicity.5levelWhite                              0.094778 .
## demo_race_hispanic1                                     0.853577
## interview_age                                           0.129049
## bmi                                                     0.021385 *
## household.income[>=200K]                                0.035125 *
## household.income[100K-200K]                             0.110719
## household.income[12K-16K]                               0.904848
## household.income[16K-25K]                               0.553535
## household.income[25K-35K]                               0.403539
## household.income[35K-50K]                               0.728372
## household.income[50K-75K]                               0.396639
## household.income[5K-12K]                                0.889770
## household.income[75K-100K]                              0.251772
## high.educBachelor                                       0.626454
## high.educHS Diploma/GED                                 0.122139
## high.educPost Graduate Degree                           0.750087
## high.educSome College                                   0.569706
## hormone_scr_ert_mean:rt_diff_large_neutral_z            0.877866
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0224
## lmer.REML =  11326  Scale est. = 11.487    n = 1856
```

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)                                 2.3358763  2.3853060   0.979
## PDS_score                                   0.5622242  0.2442638   2.302
## hormone_sal_end_min_since_midnight          0.0003113  0.0007035   0.442
## hormone_scr_ert_mean                       -0.0033381  0.0055397  -0.603
## rt_diff_large_neutral_z                     0.5405083  0.2352366   2.298
## race.ethnicity.5levelBlack                 -0.0344391  0.9173633  -0.038
## race.ethnicity.5levelMixed                  1.9818917  0.8844950   2.241
## race.ethnicity.5levelOther                  1.3174392  1.0381103   1.269
## race.ethnicity.5levelWhite                  1.4690437  0.8317064   1.766
## demo_race_hispanic1                        -0.4930883  0.3575260  -1.379
## interview_age                              -0.0039557  0.0159139  -0.249
## bmi                                         0.0838773  0.0346540   2.420
## household.income[>=200K]                   -2.3193833  0.9483327  -2.446
## household.income[100K-200K]                -1.8467413  0.8931267  -2.068
## household.income[12K-16K]                  -1.4196292  1.1712234  -1.212
## household.income[16K-25K]                   0.1707846  0.9712591   0.176
## household.income[25K-35K]                  -0.5593276  0.9422207  -0.594
## household.income[35K-50K]                  -0.1797967  0.9164576  -0.196
## household.income[50K-75K]                  -1.2934649  0.8902348  -1.453
## household.income[5K-12K]                    1.0658757  1.0288116   1.036
## household.income[75K-100K]                 -1.6783374  0.9037485  -1.857
## high.educBachelor                           0.7850603  0.7887649   0.995
## high.educHS Diploma/GED                    -0.7591479  0.8177593  -0.928
## high.educPost Graduate Degree               0.5256598  0.8026670   0.655
## high.educSome College                       0.8545964  0.7525903   1.136
## hormone_scr_ert_mean:rt_diff_large_neutral_z -0.0102096  0.0057915  -1.763
##                                            Pr(>|t|)
## (Intercept)                                  0.3276
## PDS_score                                    0.0215 *
## hormone_sal_end_min_since_midnight           0.6582
## hormone_scr_ert_mean                         0.5469
## rt_diff_large_neutral_z                      0.0217 *
## race.ethnicity.5levelBlack                   0.9701
## race.ethnicity.5levelMixed                   0.0252 *
## race.ethnicity.5levelOther                   0.2046
## race.ethnicity.5levelWhite                   0.0775 .
## demo_race_hispanic1                          0.1680
## interview_age                                0.8037
## bmi                                          0.0156 *
## household.income[>=200K]                     0.0145 *
## household.income[100K-200K]                  0.0388 *
## household.income[12K-16K]                    0.2256
## household.income[16K-25K]                    0.8604
## household.income[25K-35K]                    0.5528
## household.income[35K-50K]                    0.8445
## household.income[50K-75K]                    0.1464
```

```
## household.income[5K-12K]                    0.3003
## household.income[75K-100K]                   0.0635 .
## high.educBachelor                           0.3197
## high.educHS Diploma/GED                      0.3534
## high.educPost Graduate Degree               0.5126
## high.educSome College                       0.2563
## hormone_scr_ert_mean:rt_diff_large_neutral_z  0.0781 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0268
## lmer.REML =  11968  Scale est. = 15.042    n = 1960
```

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)                       6.3499534  2.4327455   2.610
## PDS_score                         0.6552757  0.1957904   3.347
## hormone_sal_end_min_since_midnight -0.0008401 0.0007343 -1.144
## hormone_scr_ert_mean             -0.0075569  0.0077544  -0.975
## rt_diff_large_small_z            -0.2627412  0.2849022  -0.922
## race.ethnicity.5levelBlack       -0.1301074  0.9329195  -0.139
## race.ethnicity.5levelMixed        1.5477935  0.8989518   1.722
## race.ethnicity.5levelOther        2.0181724  1.0145621   1.989
## race.ethnicity.5levelWhite        1.4113196  0.8436794   1.673
## demo_race_hispanic1               0.0393746  0.3766843   0.105
## interview_age                    -0.0247378  0.0166887  -1.482
## bmi                               0.0750706  0.0332078   2.261
## household.income[>=200K]         -1.8817260  0.9059359  -2.077
## household.income[100K-200K]      -1.3261222  0.8510178  -1.558
## household.income[12K-16K]        -0.1274722  1.1018354  -0.116
## household.income[16K-25K]         0.6014232  0.9560722   0.629
## household.income[25K-35K]        -0.7174231  0.8990075  -0.798
## household.income[35K-50K]        -0.2647043  0.8565661  -0.309
## household.income[50K-75K]        -0.6838949  0.8617822  -0.794
## household.income[5K-12K]          0.1506778  1.0052920   0.150
## household.income[75K-100K]       -0.9664933  0.8587333  -1.125
## high.educBachelor                -0.4531883  0.8209450  -0.552
```

```
## high.educHS Diploma/GED                     -1.3238767  0.8386840  -1.579
## high.educPost Graduate Degree               -0.3183888  0.8270804  -0.385
## high.educSome College                       -0.4731392  0.7739579  -0.611
## hormone_scr_ert_mean:rt_diff_large_small_z   0.0021802  0.0073014   0.299
##                                             Pr(>|t|)
## (Intercept)                                 0.009123 **
## PDS_score                                   0.000834 ***
## hormone_sal_end_min_since_midnight          0.252786
## hormone_scr_ert_mean                        0.329920
## rt_diff_large_small_z                       0.356538
## race.ethnicity.5levelBlack                  0.889100
## race.ethnicity.5levelMixed                  0.085279 .
## race.ethnicity.5levelOther                  0.046827 *
## race.ethnicity.5levelWhite                  0.094535 .
## demo_race_hispanic1                         0.916761
## interview_age                               0.138430
## bmi                                         0.023899 *
## household.income[>=200K]                    0.037931 *
## household.income[100K-200K]                 0.119340
## household.income[12K-16K]                   0.907910
## household.income[16K-25K]                   0.529391
## household.income[25K-35K]                   0.424964
## household.income[35K-50K]                   0.757334
## household.income[50K-75K]                   0.427542
## household.income[5K-12K]                    0.880872
## household.income[75K-100K]                  0.260530
## high.educBachelor                           0.580993
## high.educHS Diploma/GED                     0.114620
## high.educPost Graduate Degree               0.700315
## high.educSome College                       0.541061
## hormone_scr_ert_mean:rt_diff_large_small_z  0.765283
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0232
## lmer.REML =  11324  Scale est. = 11.418    n = 1856
```

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)                                2.4074685  2.3873976   1.008
```

```
## PDS_score                                      0.5405574  0.2442719   2.213
## hormone_sal_end_min_since_midnight            0.0003204  0.0007038   0.455
## hormone_scr_ert_mean                          -0.0010487  0.0052992  -0.198
## rt_diff_large_small_z                          0.1274881  0.2414661   0.528
## race.ethnicity.5levelBlack                    -0.0579034  0.9181415  -0.063
## race.ethnicity.5levelMixed                     1.9374157  0.8851899   2.189
## race.ethnicity.5levelOther                     1.2624765  1.0393507   1.215
## race.ethnicity.5levelWhite                     1.4413561  0.8323635   1.732
## demo_race_hispanic1                           -0.5034986  0.3578136  -1.407
## interview_age                                 -0.0044821  0.0159291  -0.281
## bmi                                            0.0837135  0.0346944   2.413
## household.income[>=200K]                      -2.3191180  0.9488517  -2.444
## household.income[100K-200K]                   -1.8846707  0.8938113  -2.109
## household.income[12K-16K]                     -1.4449275  1.1720474  -1.233
## household.income[16K-25K]                      0.1509386  0.9722532   0.155
## household.income[25K-35K]                     -0.5935739  0.9432983  -0.629
## household.income[35K-50K]                     -0.1884527  0.9172210  -0.205
## household.income[50K-75K]                     -1.2989350  0.8910183  -1.458
## household.income[5K-12K]                       1.0048797  1.0296805   0.976
## household.income[75K-100K]                    -1.7083790  0.9047138  -1.888
## high.educBachelor                              0.7856305  0.7928614   0.991
## high.educHS Diploma/GED                       -0.7251275  0.8206868  -0.884
## high.educPost Graduate Degree                  0.5327715  0.8063091   0.661
## high.educSome College                          0.8469704  0.7552131   1.121
## hormone_scr_ert_mean:rt_diff_large_small_z    -0.0057446  0.0062765  -0.915
##                                               Pr(>|t|)
## (Intercept)                                    0.3134
## PDS_score                                      0.0270 *
## hormone_sal_end_min_since_midnight             0.6490
## hormone_scr_ert_mean                           0.8431
## rt_diff_large_small_z                          0.5976
## race.ethnicity.5levelBlack                     0.9497
## race.ethnicity.5levelMixed                     0.0287 *
## race.ethnicity.5levelOther                     0.2246
## race.ethnicity.5levelWhite                     0.0835 .
## demo_race_hispanic1                            0.1595
## interview_age                                  0.7785
## bmi                                            0.0159 *
## household.income[>=200K]                       0.0146 *
## household.income[100K-200K]                    0.0351 *
## household.income[12K-16K]                      0.2178
## household.income[16K-25K]                      0.8766
## household.income[25K-35K]                      0.5293
## household.income[35K-50K]                      0.8372
## household.income[50K-75K]                      0.1451
## household.income[5K-12K]                       0.3292
## household.income[75K-100K]                     0.0591 .
## high.educBachelor                              0.3219
## high.educHS Diploma/GED                        0.3770
## high.educPost Graduate Degree                  0.5088
## high.educSome College                          0.2622
## hormone_scr_ert_mean:rt_diff_large_small_z     0.3602
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## 
## 
## R-sq.(adj) =  0.0246
## lmer.REML =  11972  Scale est. = 15.09     n = 1960
```