Supplement D: Testosterone Models Only (With Testosterone Outliers)

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

Contents

Sensitivity Analysis Results for Sample 2

1—Internalizing~Puberty—

1.9 Model: CBCL internalizing factor ~ Testosterone

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       3.0286475  2.2347706   1.355 0.175470
## hormone_scr_ert_mean              0.0073520  0.0063170   1.164 0.244599
## hormone_sal_end_min_since_midnight 0.0010040  0.0006748   1.488 0.136887
## race.ethnicity.5levelBlack       -0.3962176  0.8914056  -0.444 0.656731
## race.ethnicity.5levelMixed        1.0783587  0.8716253   1.237 0.216141
## race.ethnicity.5levelOther        0.1354270  0.9906221   0.137 0.891272
## race.ethnicity.5levelWhite        0.9937665  0.8200099   1.212 0.225672
## interview_age                     0.0076022  0.0148571   0.512 0.608914
## bmi                               0.0393995  0.0308455   1.277 0.201614
## household.income[>=200K]         -3.2163172  0.8482523  -3.792 0.000153 ***
## household.income[100K-200K]      -2.6824816  0.7933121  -3.381 0.000733 ***
## household.income[12K-16K]        -0.2185923  1.0298298  -0.212 0.831922
## household.income[16K-25K]        -0.1261297  0.8508218  -0.148 0.882162
## household.income[25K-35K]        -0.8802096  0.8504442  -1.035 0.300774
## household.income[35K-50K]        -1.3769834  0.8068805  -1.707 0.088035 .
## household.income[50K-75K]        -1.7672975  0.7853197  -2.250 0.024513 *
```

```
## household.income[5K-12K]              -0.1976832  0.8801223  -0.225 0.822303
## household.income[75K-100K]            -2.7925461  0.8085098  -3.454 0.000562 ***
## high.educBachelor                      1.3179778  0.7937485   1.660 0.096956 .
## high.educHS Diploma/GED               -0.7161389  0.7860961  -0.911 0.362384
## high.educPost Graduate Degree          0.5556752  0.7981543   0.696 0.486371
## high.educSome College                  0.9668950  0.7550032   1.281 0.200441
## demo_race_hispanic1                   -0.0571343  0.3555355  -0.161 0.872344
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0328
## lmer.REML =  14980  Scale est. = 14.793    n = 2414
```

1.10 Model: CBCL Anxious-Depressed ~ Testosterone

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        2.4995559  1.2603303   1.983  0.04745 *
## hormone_scr_ert_mean               0.0056765  0.0035622   1.594  0.11118
## hormone_sal_end_min_since_midnight 0.0002035  0.0003808   0.534  0.59308
## race.ethnicity.5levelBlack        -0.1247674  0.4991322  -0.250  0.80263
## race.ethnicity.5levelMixed         0.5222394  0.4878512   1.070  0.28451
## race.ethnicity.5levelOther         0.2841313  0.5562119   0.511  0.60952
## race.ethnicity.5levelWhite         0.6524048  0.4588750   1.422  0.15523
## interview_age                     -0.0079380  0.0084058  -0.944  0.34509
## bmi                                0.0083336  0.0174097   0.479  0.63221
## household.income[>=200K]          -1.3075260  0.4760414  -2.747  0.00607 **
## household.income[100K-200K]       -1.0322597  0.4453648  -2.318  0.02055 *
## household.income[12K-16K]          0.0473597  0.5777839   0.082  0.93468
## household.income[16K-25K]         -0.1494426  0.4778724  -0.313  0.75452
## household.income[25K-35K]         -0.3361954  0.4776166  -0.704  0.48156
## household.income[35K-50K]         -0.4336790  0.4529384  -0.957  0.33842
## household.income[50K-75K]         -0.7848990  0.4409161  -1.780  0.07518 .
## household.income[5K-12K]           0.0173083  0.4940096   0.035  0.97205
## household.income[75K-100K]        -1.0010137  0.4537865  -2.206  0.02748 *
## high.educBachelor                  1.1181021  0.4456485   2.509  0.01218 *
## high.educHS Diploma/GED           -0.0836354  0.4414950  -0.189  0.84977
## high.educPost Graduate Degree      0.7794329  0.4480875   1.739  0.08208 .
## high.educSome College              0.7404350  0.4240404   1.746  0.08091 .
## demo_race_hispanic1                0.0851144  0.1998003   0.426  0.67015
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.016
## lmer.REML =  12249  Scale est. = 5.9561    n = 2414
```

1.11 Model: CBCL Withdrawn-Depressed ~ Testosterone

Female participants

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

Male participants

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

```
##      race.ethnicity.5level + interview_age + bmi + household.income +
##      high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       0.0459969  0.7303944   0.063 0.949791
## hormone_scr_ert_mean              0.0018329  0.0020625   0.889 0.374259
## hormone_sal_end_min_since_midnight 0.0004622 0.0002125   2.176 0.029678 *
## race.ethnicity.5levelBlack       -0.0834694  0.2896389  -0.288 0.773231
## race.ethnicity.5levelMixed        0.2955943  0.2835755   1.042 0.297340
## race.ethnicity.5levelOther        0.0558082  0.3235473   0.172 0.863068
## race.ethnicity.5levelWhite        0.1478527  0.2662216   0.555 0.578690
## interview_age                     0.0122603  0.0048817   2.511 0.012088 *
## bmi                               0.0009029  0.0101402   0.089 0.929054
## household.income[>=200K]         -1.1037411  0.2762803  -3.995 6.66e-05 ***
## household.income[100K-200K]      -0.9515054  0.2589536  -3.674 0.000244 ***
## household.income[12K-16K]         0.0198110  0.3368509   0.059 0.953106
## household.income[16K-25K]         0.0793889  0.2784135   0.285 0.775556
## household.income[25K-35K]        -0.2908662  0.2782088  -1.045 0.295900
## household.income[35K-50K]        -0.5487948  0.2639591  -2.079 0.037715 *
## household.income[50K-75K]        -0.6843144  0.2567330  -2.665 0.007740 **
## household.income[5K-12K]         -0.0661644  0.2881536  -0.230 0.818411
## household.income[75K-100K]       -1.0063100  0.2641296  -3.810 0.000143 ***
## high.educBachelor                -0.0157453  0.2589503  -0.061 0.951520
## high.educHS Diploma/GED          -0.5304292  0.2565612  -2.067 0.038799 *
## high.educPost Graduate Degree    -0.2723293  0.2605073  -1.045 0.295953
## high.educSome College            -0.0885176  0.2462329  -0.359 0.719262
## demo_race_hispanic1              -0.1449827  0.1115774  -1.299 0.193935
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0398
## lmer.REML = 9663.3  Scale est. = 2.0129    n = 2414
```

1.12 Model: CBCL Depressed DSM-5 ~ Testosterone

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     race.ethnicity.5level + interview_age + bmi + household.income +
##     high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.9606536  0.8506681   1.129 0.258887
## hormone_scr_ert_mean               0.0033324  0.0024046   1.386 0.165928
## hormone_sal_end_min_since_midnight 0.0004092  0.0002556   1.601 0.109502
## race.ethnicity.5levelBlack        -0.1028422  0.3390744  -0.303 0.761685
## race.ethnicity.5levelMixed         0.2271622  0.3316244   0.685 0.493411
## race.ethnicity.5levelOther         0.0573931  0.3771088   0.152 0.879048
## race.ethnicity.5levelWhite         0.1958322  0.3118974   0.628 0.530147
## interview_age                      0.0055632  0.0056610   0.983 0.325847
## bmi                               -0.0015029  0.0117533  -0.128 0.898260
## household.income[>=200K]          -1.1662785  0.3227185  -3.614 0.000308 ***
## household.income[100K-200K]       -1.1486449  0.3019142  -3.805 0.000146 ***
## household.income[12K-16K]          0.0965927  0.3920373   0.246 0.805404
## household.income[16K-25K]         -0.4035772  0.3239085  -1.246 0.212901
```

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```
## household.income[25K-35K]             -0.6264220  0.3237561  -1.935 0.053126 .
## household.income[35K-50K]             -0.7671069  0.3071712  -2.497 0.012580 *
## household.income[50K-75K]             -0.8111312  0.2989348  -2.713 0.006707 **
## household.income[5K-12K]              -0.2189912  0.3350897  -0.654 0.513477
## household.income[75K-100K]            -1.0073649  0.3077334  -3.273 0.001077 **
## high.educBachelor                      0.2968121  0.3020542   0.983 0.325881
## high.educHS Diploma/GED               -0.3650428  0.2991576  -1.220 0.222496
## high.educPost Graduate Degree         -0.0119893  0.3037506  -0.039 0.968518
## high.educSome College                  0.3189471  0.2872947   1.110 0.267036
## demo_race_hispanic1                   -0.1367509  0.1345800  -1.016 0.309670
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0264
## lmer.REML =  10366  Scale est. = 2.2239    n = 2414
```

1.13 Model: CBCL internalizing factor ~ Testosterone + PDS

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        3.0144311  2.2321353   1.350 0.176993
## hormone_scr_ert_mean               0.0057731  0.0063394   0.911 0.362565
## hormone_sal_end_min_since_midnight 0.0010310  0.0006739   1.530 0.126169
## PDS_score                          0.5657379  0.2198550   2.573 0.010135 *
## race.ethnicity.5levelBlack        -0.5829660  0.8934560  -0.652 0.514152
## race.ethnicity.5levelMixed         1.0818224  0.8707482   1.242 0.214209
## race.ethnicity.5levelOther         0.1620226  0.9896182   0.164 0.869964
## race.ethnicity.5levelWhite         1.0003674  0.8191795   1.221 0.222138
## interview_age                      0.0026620  0.0149650   0.178 0.858829
## bmi                                0.0286546  0.0310887   0.922 0.356776
## household.income[>=200K]          -3.0185773  0.8508746  -3.548 0.000396 ***
## household.income[100K-200K]       -2.4886664  0.7960850  -3.126 0.001793 **
## household.income[12K-16K]         -0.1187140  1.0295366  -0.115 0.908211
## household.income[16K-25K]          0.0512793  0.8527548   0.060 0.952054
## household.income[25K-35K]         -0.6784252  0.8531814  -0.795 0.426593
## household.income[35K-50K]         -1.1903898  0.8093396  -1.471 0.141472
## household.income[50K-75K]         -1.6182445  0.7866658  -2.057 0.039786 *
## household.income[5K-12K]          -0.1581088  0.8793686  -0.180 0.857326
## household.income[75K-100K]        -2.6057824  0.8109427  -3.213 0.001330 **
## high.educBachelor                  1.2413106  0.7934820   1.564 0.117860
## high.educHS Diploma/GED           -0.8001320  0.7859552  -1.018 0.308763
## high.educPost Graduate Degree      0.4851395  0.7977989   0.608 0.543181
## high.educSome College              0.8648177  0.7552586   1.145 0.252298
## demo_race_hispanic1               -0.0747158  0.3551562  -0.210 0.833393
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0343
## lmer.REML =  14975  Scale est. = 14.677    n = 2414
```

12

1.14 Model: CBCL internalizing factor ~ Testosterone + Pubertal category

Female participants

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

Male participants

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

```
## 
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
## 
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       3.2926909  2.2383707   1.471 0.141417
## hormone_scr_ert_mean              0.0067168  0.0063372   1.060 0.289297
## hormone_sal_end_min_since_midnight 0.0010070  0.0006745   1.493 0.135584
## pds_p_ss_categoryEarly            0.4435484  0.2780695   1.595 0.110822
## pds_p_ss_categoryLate            -0.3249702  1.6833786  -0.193 0.846939
## pds_p_ss_categoryMid              1.1009855  0.5253081   2.096 0.036197 *
## race.ethnicity.5levelBlack       -0.4967777  0.8931716  -0.556 0.578130
## race.ethnicity.5levelMixed        1.1405889  0.8718444   1.308 0.190915
## race.ethnicity.5levelOther        0.2060783  0.9906174   0.208 0.835223
## race.ethnicity.5levelWhite        1.0843823  0.8205521   1.322 0.186452
## interview_age                     0.0047249  0.0149278   0.317 0.751640
## bmi                               0.0316193  0.0310156   1.019 0.308085
## household.income[>=200K]         -3.0874223  0.8527703  -3.620 0.000300 ***
## household.income[100K-200K]      -2.5539043  0.7980549  -3.200 0.001392 **
## household.income[12K-16K]        -0.2025767  1.0325136  -0.196 0.844472
## household.income[16K-25K]        -0.0193365  0.8551826  -0.023 0.981963
## household.income[25K-35K]        -0.7414939  0.8579663  -0.864 0.387540
## household.income[35K-50K]        -1.2607814  0.8112603  -1.554 0.120293
## household.income[50K-75K]        -1.6665557  0.7884079  -2.114 0.034634 *
## household.income[5K-12K]         -0.1995030  0.8807932  -0.227 0.820829
## household.income[75K-100K]       -2.6826529  0.8125555  -3.302 0.000976 ***
## high.educBachelor                 1.2432473  0.7946093   1.565 0.117809
## high.educHS Diploma/GED          -0.8257613  0.7876244  -1.048 0.294551
## high.educPost Graduate Degree     0.4887480  0.7989134   0.612 0.540751
## high.educSome College             0.8466691  0.7567887   1.119 0.263353
## demo_race_hispanic1              -0.0949471  0.3558534  -0.267 0.789634
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## 
## R-sq.(adj) =  0.0334
## lmer.REML =  14972  Scale est. = 14.672    n = 2414
```

1.15 Model: CBCL Anxious-Depressed ~ Testosterone + PDS

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                         Estimate Std. Error  t value Pr(>|t|)
## (Intercept)                            2.4895586  1.2591253    1.977   0.0481 *
## hormone_scr_ert_mean                   0.0048540  0.0035752    1.358   0.1747
## hormone_sal_end_min_since_midnight     0.0002187  0.0003805    0.575   0.5654
## PDS_score                              0.2988139  0.1241645    2.407   0.0162 *
## race.ethnicity.5levelBlack            -0.2211984  0.5003322   -0.442   0.6585
## race.ethnicity.5levelMixed             0.5262998  0.4874749    1.080   0.2804
```

```
## race.ethnicity.5levelOther              0.3000381  0.5557819   0.540   0.5894
## race.ethnicity.5levelWhite              0.6578370  0.4585279   1.435   0.1515
## interview_age                          -0.0105535  0.0084685  -1.246   0.2128
## bmi                                     0.0026488  0.0175525   0.151   0.8801
## household.income[>=200K]               -1.2023109  0.4776253  -2.517   0.0119 *
## household.income[100K-200K]            -0.9290461  0.4470311  -2.078   0.0378 *
## household.income[12K-16K]               0.1012213  0.5777150   0.175   0.8609
## household.income[16K-25K]              -0.0560400  0.4790249  -0.117   0.9069
## household.income[25K-35K]              -0.2292046  0.4792510  -0.478   0.6325
## household.income[35K-50K]              -0.3356614  0.4543746  -0.739   0.4601
## household.income[50K-75K]              -0.7057219  0.4417528  -1.598   0.1103
## household.income[5K-12K]                0.0387277  0.4936540   0.078   0.9375
## household.income[75K-100K]             -0.9022525  0.4552327  -1.982   0.0476 *
## high.educBachelor                       1.0774342  0.4455685   2.418   0.0157 *
## high.educHS Diploma/GED                -0.1281101  0.4414843  -0.290   0.7717
## high.educPost Graduate Degree           0.7418547  0.4479600   1.656   0.0978 .
## high.educSome College                   0.6862072  0.4242569   1.617   0.1059
## demo_race_hispanic1                     0.0763354  0.1996459   0.382   0.7022
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0173
## lmer.REML =  12245  Scale est. = 5.918     n = 2414
```

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

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          2.6258122  1.2623974   2.080   0.0376 *
## hormone_scr_ert_mean                 0.0053192  0.0035739   1.488   0.1368
## hormone_sal_end_min_since_midnight   0.0002066  0.0003808   0.543   0.5874
## pds_p_ss_categoryEarly               0.2097963  0.1569948   1.336   0.1816
## pds_p_ss_categoryLate               -0.0469720  0.9463756  -0.050   0.9604
## pds_p_ss_categoryMid                 0.6518182  0.2965611   2.198   0.0281 *
## race.ethnicity.5levelBlack          -0.1823356  0.5001786  -0.365   0.7155
## race.ethnicity.5levelMixed           0.5603464  0.4880525   1.148   0.2510
## race.ethnicity.5levelOther           0.3235700  0.5563012   0.582   0.5609
## race.ethnicity.5levelWhite           0.7033155  0.4592896   1.531   0.1258
## interview_age                       -0.0094641  0.0084463  -1.120   0.2626
## bmi                                  0.0042441  0.0175092   0.242   0.8085
## household.income[>=200K]            -1.2276451  0.4786194  -2.565   0.0104 *
## household.income[100K-200K]         -0.9532634  0.4480638  -2.128   0.0335 *
## household.income[12K-16K]            0.0638220  0.5793017   0.110   0.9123
## household.income[16K-25K]           -0.0793155  0.4803360  -0.165   0.8689
## household.income[25K-35K]           -0.2444914  0.4818463  -0.507   0.6119
## household.income[35K-50K]           -0.3614788  0.4553907  -0.794   0.4274
## household.income[50K-75K]           -0.7217535  0.4426700  -1.630   0.1031
## household.income[5K-12K]             0.0221462  0.4943934   0.045   0.9643
```

```
## household.income[75K-100K]              -0.9318984  0.4560830  -2.043   0.0411 *
## high.educBachelor                        1.0805314  0.4461472   2.422   0.0155 *
## high.educHS Diploma/GED                 -0.1437072  0.4423699  -0.325   0.7453
## high.educPost Graduate Degree            0.7465410  0.4485279   1.664   0.0962 .
## high.educSome College                    0.6768556  0.4250609   1.592   0.1114
## demo_race_hispanic1                      0.0632766  0.2000246   0.316   0.7518
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0166
## lmer.REML =  12244  Scale est. = 5.9137    n = 2414
```

1.17 Model: CBCL Withdrawn-Depressed ~ Testosterone + PDS

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.0379337  0.7301845   0.052 0.958572
## hormone_scr_ert_mean               0.0014847  0.0020716   0.717 0.473645
## hormone_sal_end_min_since_midnight 0.0004684  0.0002125   2.204 0.027620 *
## PDS_score                          0.1271100  0.0724044   1.756 0.079292 .
## race.ethnicity.5levelBlack        -0.1253874  0.2905853  -0.431 0.666144
## race.ethnicity.5levelMixed         0.2967996  0.2835787   1.047 0.295380
## race.ethnicity.5levelOther         0.0632148  0.3235344   0.195 0.845106
## race.ethnicity.5levelWhite         0.1500898  0.2662371   0.564 0.572981
## interview_age                      0.0111864  0.0049198   2.274 0.023069 *
## bmi                               -0.0015220  0.0102301  -0.149 0.881744
## household.income[>=200K]          -1.0586501  0.2773895  -3.816 0.000139 ***
## household.income[100K-200K]       -0.9070960  0.2600959  -3.488 0.000496 ***
## household.income[12K-16K]          0.0428659  0.3370367   0.127 0.898805
## household.income[16K-25K]          0.1194991  0.2792832   0.428 0.668779
## household.income[25K-35K]         -0.2449158  0.2793486  -0.877 0.380716
## household.income[35K-50K]         -0.5064745  0.2649776  -1.911 0.056074 .
## household.income[50K-75K]         -0.6501051  0.2574039  -2.526 0.011614 *
## household.income[5K-12K]          -0.0568511  0.2881376  -0.197 0.843605
## household.income[75K-100K]        -0.9635807  0.2651605  -3.634 0.000285 ***
## high.educBachelor                 -0.0333327  0.2590791  -0.129 0.897639
## high.educHS Diploma/GED           -0.5491442  0.2567192  -2.139 0.032530 *
## high.educPost Graduate Degree     -0.2888860  0.2606148  -1.108 0.267767
## high.educSome College             -0.1116350  0.2465185  -0.453 0.650701
## demo_race_hispanic1               -0.1503614  0.1116355  -1.347 0.178141
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0401
## lmer.REML = 9663.7  Scale est. = 1.9942     n = 2414
```

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

Female participants

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

Male participants

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

```
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       0.1019420  0.7315091   0.139 0.889179
## hormone_scr_ert_mean              0.0018619  0.0020693   0.900 0.368333
## hormone_sal_end_min_since_midnight 0.0004622  0.0002124   2.176 0.029627 *
## pds_p_ss_categoryEarly            0.0723901  0.0913691   0.792 0.428275
## pds_p_ss_categoryLate            -0.7497152  0.5512435  -1.360 0.173944
## pds_p_ss_categoryMid              0.3214435  0.1730029   1.858 0.063289 .
## race.ethnicity.5levelBlack       -0.0944790  0.2901799  -0.326 0.744765
## race.ethnicity.5levelMixed        0.3156899  0.2836418   1.113 0.265826
## race.ethnicity.5levelOther        0.0802595  0.3235646   0.248 0.804119
## race.ethnicity.5levelWhite        0.1741381  0.2664207   0.654 0.513419
## interview_age                     0.0118813  0.0049041   2.423 0.015478 *
## bmi                              -0.0008318  0.0101987  -0.082 0.935008
## household.income[>=200K]         -1.0931724  0.2777321  -3.936 8.52e-05 ***
## household.income[100K-200K]      -0.9411849  0.2605106  -3.613 0.000309 ***
## household.income[12K-16K]        -0.0066111  0.3377250  -0.020 0.984384
## household.income[16K-25K]         0.0895591  0.2798283   0.320 0.748958
## household.income[25K-35K]        -0.2742967  0.2806819  -0.977 0.328544
## household.income[35K-50K]        -0.5394985  0.2653643  -2.033 0.042158 *
## household.income[50K-75K]        -0.6753242  0.2577486  -2.620 0.008846 **
## household.income[5K-12K]         -0.0803501  0.2883444  -0.279 0.780530
## household.income[75K-100K]       -0.9993335  0.2654680  -3.764 0.000171 ***
## high.educBachelor                -0.0495297  0.2592695  -0.191 0.848514
## high.educHS Diploma/GED          -0.5754866  0.2570814  -2.239 0.025278 *
## high.educPost Graduate Degree    -0.3035604  0.2607853  -1.164 0.244531
## high.educSome College            -0.1347680  0.2468542  -0.546 0.585157
## demo_race_hispanic1              -0.1579247  0.1116984  -1.414 0.157536
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0409
## lmer.REML = 9661.3  Scale est. = 2.0024    n = 2414
```

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

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     PDS_score + race.ethnicity.5level + interview_age + bmi +
##     household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         0.9561952  0.8504611   1.124 0.260988
## hormone_scr_ert_mean                0.0030032  0.0024154   1.243 0.213859
## hormone_sal_end_min_since_midnight  0.0004159  0.0002554   1.628 0.103620
## PDS_score                           0.1189409  0.0838652   1.418 0.156251
## race.ethnicity.5levelBlack         -0.1416791  0.3401871  -0.416 0.677101
## race.ethnicity.5levelMixed          0.2280399  0.3316215   0.688 0.491739
```

```
## race.ethnicity.5levelOther           0.0629055  0.3771007   0.167 0.867531
## race.ethnicity.5levelWhite           0.1973233  0.3118885   0.633 0.527008
## interview_age                        0.0045331  0.0057072   0.794 0.427117
## bmi                                 -0.0037668  0.0118577  -0.318 0.750767
## household.income[>=200K]            -1.1249323  0.3240337  -3.472 0.000526 ***
## household.income[100K-200K]         -1.1081691  0.3032714  -3.654 0.000264 ***
## household.income[12K-16K]            0.1171016  0.3923223   0.298 0.765360
## household.income[16K-25K]           -0.3665176  0.3249709  -1.128 0.259498
## household.income[25K-35K]           -0.5840923  0.3251256  -1.797 0.072539 .
## household.income[35K-50K]           -0.7283311  0.3084172  -2.362 0.018280 *
## household.income[50K-75K]           -0.7800787  0.2997490  -2.602 0.009313 **
## household.income[5K-12K]            -0.2108222  0.3351413  -0.629 0.529373
## household.income[75K-100K]          -0.9683479  0.3089695  -3.134 0.001745 **
## high.educBachelor                    0.2806104  0.3022482   0.928 0.353288
## high.educHS Diploma/GED             -0.3826467  0.2993949  -1.278 0.201350
## high.educPost Graduate Degree       -0.0269624  0.3039149  -0.089 0.929314
## high.educSome College                0.2975682  0.2876704   1.034 0.301051
## demo_race_hispanic1                 -0.1406733  0.1345293  -1.046 0.295819
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0264
## lmer.REML =  10367  Scale est. = 2.2081    n = 2414
```

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

Female participants

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

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

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     pds_p_ss_category + race.ethnicity.5level + interview_age +
##     bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##                                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          1.0617225  0.8524284   1.246 0.213060
## hormone_scr_ert_mean                 0.0031160  0.0024135   1.291 0.196801
## hormone_sal_end_min_since_midnight   0.0004103  0.0002554   1.606 0.108366
## pds_p_ss_categoryEarly               0.1919559  0.1060067   1.811 0.070299 .
## pds_p_ss_categoryLate                0.0006244  0.6413328   0.001 0.999223
## pds_p_ss_categoryMid                 0.1502930  0.2003166   0.750 0.453162
## race.ethnicity.5levelBlack          -0.1284356  0.3399462  -0.378 0.705604
## race.ethnicity.5levelMixed           0.2342610  0.3319201   0.706 0.480397
## race.ethnicity.5levelOther           0.0713622  0.3773381   0.189 0.850015
## race.ethnicity.5levelWhite           0.2144131  0.3122957   0.687 0.492420
## interview_age                        0.0046102  0.0056904   0.810 0.417924
## bmi                                 -0.0038642  0.0118250  -0.327 0.743862
## household.income[>=200K]            -1.1409562  0.3246284  -3.515 0.000449 ***
## household.income[100K-200K]         -1.1221167  0.3039115  -3.692 0.000227 ***
## household.income[12K-16K]            0.1016063  0.3933270   0.258 0.796178
## household.income[16K-25K]           -0.3921133  0.3257791  -1.204 0.228857
## household.income[25K-35K]           -0.6156012  0.3268359  -1.884 0.059752 .
## household.income[35K-50K]           -0.7471845  0.3090409  -2.418 0.015691 *
## household.income[50K-75K]           -0.7938414  0.3003070  -2.643 0.008261 **
## household.income[5K-12K]            -0.2228582  0.3355699  -0.664 0.506679
```

```
## household.income[75K-100K]          -0.9873713  0.3094770  -3.190 0.001439 **
## high.educBachelor                    0.2779725  0.3025752   0.919 0.358351
## high.educHS Diploma/GED              -0.3836298  0.2999269  -1.279 0.200994
## high.educPost Graduate Degree        -0.0297313  0.3042355  -0.098 0.922159
## high.educSome College                0.2922958  0.2881541   1.014 0.310507
## demo_race_hispanic1                  -0.1421270  0.1346920  -1.055 0.291441
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0258
## lmer.REML =  10365  Scale est. = 2.1999    n = 2414
```

2—Reward~Puberty—

2.11 Model: Caudate Anticipation ~ Testosterone

Female participants

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


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

Male participants

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


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

```
##
## Formula:
## caudate_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -2.363e-01  3.548e-01  -0.666   0.5055
## hormone_scr_ert_mean               -1.554e-03  1.231e-03  -1.263   0.2068
## hormone_sal_end_min_since_midnight  1.804e-04  1.251e-04   1.442   0.1494
## interview_age                       2.824e-03  2.793e-03   1.011   0.3121
## MRI_minus_hormone_date_time         3.224e-07  2.892e-06   0.111   0.9112
## bmi                                -1.018e-02  5.701e-03  -1.785   0.0744 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00182
## lmer.REML = 5086.5  Scale est. = 0.79269   n = 1889
```

2.12 Model B: Putamen Anticipation ~ Testosterone

Female participants

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

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

Male participants

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

```
## rescaling

##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##      interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -2.876e-01  3.490e-01  -0.824   0.4101
## hormone_scr_ert_mean              -1.963e-03  1.214e-03  -1.617   0.1060
## hormone_sal_end_min_since_midnight 2.184e-04  1.231e-04   1.775   0.0760 .
## interview_age                      3.242e-03  2.751e-03   1.178   0.2389
## MRI_minus_hormone_date_time        5.955e-07  2.856e-06   0.208   0.8349
## bmi                               -1.030e-02  5.629e-03  -1.830   0.0674 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00331
## lmer.REML = 5027.5  Scale est. = 0.60689   n = 1889
```

2.13 Model: Accumbens Anticipation ~ Testosterone

Female participants

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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsn_ant_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        1.672e-01  2.825e-01   0.592    0.554
## hormone_scr_ert_mean              -5.010e-04  9.837e-04  -0.509    0.611
## hormone_sal_end_min_since_midnight 1.037e-04  9.915e-05   1.046    0.296
## interview_age                     -1.335e-03  2.224e-03  -0.601    0.548
## MRI_minus_hormone_date_time       -3.340e-06  2.354e-06  -1.419    0.156
## bmi                               -2.943e-03  4.535e-03  -0.649    0.516
##
##
## R-sq.(adj) =  -0.00103
## lmer.REML = 4216.6  Scale est. = 0.43701   n = 1884
```

2.14 Model: Caudate Feedback ~ Testosterone

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       2.215e-01  3.509e-01   0.631   0.5279
## hormone_scr_ert_mean             -1.231e-03  1.208e-03  -1.018   0.3087
## hormone_sal_end_min_since_midnight -2.980e-04  1.202e-04  -2.479   0.0132 *
## interview_age                    -3.677e-04  2.761e-03  -0.133   0.8941
## MRI_minus_hormone_date_time       3.140e-06  2.837e-06   1.107   0.2685
## bmi                               4.742e-03  5.609e-03   0.846   0.3979
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00157
## lmer.REML = 5037.9  Scale est. = 0.81909   n = 1883
```

2.15 Model: Putamen Feedback ~ Testosterone

Female participants

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


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

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

Male participants

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

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##      interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          4.215e-01  3.469e-01   1.215    0.224
## hormone_scr_ert_mean                -1.675e-03  1.203e-03  -1.392    0.164
## hormone_sal_end_min_since_midnight  -1.849e-04  1.270e-04  -1.456    0.146
## interview_age                       -3.023e-03  2.731e-03  -1.107    0.268
## MRI_minus_hormone_date_time          1.906e-06  2.836e-06   0.672    0.502
## bmi                                  8.387e-03  5.558e-03   1.509    0.131
##
##
## R-sq.(adj) =  0.000875
## lmer.REML = 4986.7  Scale est. = 0.7529    n = 1887
```

2.16 Model: Accumbens Feedback ~ Testosterone

Female participants

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

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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##      interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       4.199e-02  2.836e-01   0.148    0.882
## hormone_scr_ert_mean              3.389e-06  9.874e-04   0.003    0.997
## hormone_sal_end_min_since_midnight -1.217e-04  1.033e-04  -1.178    0.239
## interview_age                     -5.243e-04  2.233e-03  -0.235    0.814
## MRI_minus_hormone_date_time       -1.968e-06  2.381e-06  -0.826    0.409
## bmi                               7.022e-03  4.583e-03   1.532    0.126
##
##
## R-sq.(adj) =  -7.56e-06
## lmer.REML = 4227.7  Scale est. = 0.41844   n = 1889
```

2.17 Model: OFC Anticipation ~ Testosterone

Female participants

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


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

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


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


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

Male participants

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


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

```
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -4.607e-01  2.429e-01  -1.896   0.0581 .
## hormone_scr_ert_mean              -1.373e-03  8.432e-04  -1.629   0.1035
## hormone_sal_end_min_since_midnight 1.581e-04  8.657e-05   1.826   0.0679 .
## interview_age                      3.275e-03  1.915e-03   1.711   0.0873 .
## MRI_minus_hormone_date_time       -1.611e-06  2.041e-06  -0.789   0.4300
## bmi                               -2.130e-03  3.905e-03  -0.545   0.5856
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00177
## lmer.REML = 3627.5  Scale est. = 0.33853   n = 1877


## 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)                        -2.069e-01  2.759e-01  -0.750    0.453
## hormone_scr_ert_mean              -4.981e-04  9.540e-04  -0.522    0.602
## hormone_sal_end_min_since_midnight 1.401e-04  9.491e-05   1.476    0.140
## interview_age                      9.465e-04  2.173e-03   0.436    0.663
## MRI_minus_hormone_date_time       -2.126e-06  2.293e-06  -0.927    0.354
## bmi                               -9.764e-04  4.407e-03  -0.222    0.825
##
##
## R-sq.(adj) =  -0.00118
## lmer.REML = 4118.6  Scale est. = 0.44242   n = 1881
```

2.18 Model: OFC Feedback ~ Testosterone

Female participants

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


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

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


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


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

Male participants

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


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

```
## (Intercept)                                  1.239e-02  2.116e-01   0.059   0.9533
## hormone_scr_ert_mean                         -1.144e-04  7.316e-04  -0.156   0.8758
## hormone_sal_end_min_since_midnight -1.377e-04  7.302e-05  -1.885   0.0595 .
## interview_age                                2.871e-04  1.665e-03   0.172   0.8632
## MRI_minus_hormone_date_time                  2.667e-06  1.720e-06   1.550   0.1212
## bmi                                          3.220e-03  3.399e-03   0.947   0.3436
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000805
## lmer.REML = 3108.6  Scale est. = 0.23216   n = 1874


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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##      interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##                                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      1.277e-01  2.488e-01   0.513   0.6080
## hormone_scr_ert_mean            -1.250e-04  8.616e-04  -0.145   0.8846
## hormone_sal_end_min_since_midnight -1.731e-04  8.598e-05  -2.013   0.0443 *
## interview_age                   -3.012e-05  1.959e-03  -0.015   0.9877
## MRI_minus_hormone_date_time      3.439e-07  2.079e-06   0.165   0.8686
## bmi                              2.085e-03  3.998e-03   0.522   0.6021
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000347
## lmer.REML = 3734.4  Scale est. = 0.33175   n = 1880
```

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)                             -6.205e-01  3.569e-01  -1.739   0.0822 .
## hormone_scr_ert_mean                     -1.181e-03  1.152e-03  -1.024   0.3057
## hormone_sal_end_min_since_midnight -9.634e-05  1.178e-04  -0.818   0.4135
## interview_age                            6.194e-03  2.829e-03   2.189   0.0287 *
## bmi                                      1.657e-03  5.428e-03   0.305   0.7602
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000917
## lmer.REML =    5645  Scale est. = 0.741     n = 2072


##
## 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)                       -6.050e-01  3.697e-01  -1.637    0.102
## hormone_scr_ert_mean              -1.068e-03  1.195e-03  -0.894    0.372
## hormone_sal_end_min_since_midnight 2.545e-05  1.244e-04   0.205    0.838
## interview_age                      4.128e-03  2.931e-03   1.408    0.159
## bmi                                7.731e-03  5.614e-03   1.377    0.169
##
##
## R-sq.(adj) =  8.65e-05
## lmer.REML =    5780  Scale est. = 0.84119   n = 2072
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -0.6892395  0.3339240  -2.064   0.0391 *
## hormone_scr_ert_mean              -0.0015019  0.0011698  -1.284   0.1993
## hormone_sal_end_min_since_midnight 0.0001139  0.0001150   0.990   0.3224
## interview_age                      0.0051086  0.0026527   1.926   0.0543 .
## bmi                                0.0010979  0.0053570   0.205   0.8376
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) =  0.000851
## lmer.REML = 5826.9  Scale est. = 0.74702   n = 2159


##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -5.402e-02  3.299e-01  -0.164    0.870
## hormone_scr_ert_mean              -4.219e-04  1.148e-03  -0.367    0.713
## hormone_sal_end_min_since_midnight 1.965e-05  1.100e-04   0.179    0.858
## interview_age                     -6.533e-05  2.621e-03  -0.025    0.980
## bmi                                2.310e-03  5.279e-03   0.438    0.662
##
##
## R-sq.(adj) =  -0.0017
## lmer.REML = 5792.7  Scale est. = 0.8378    n = 2159
```

2.20 Model: BIS-BAS-RR ~ Testosterone

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       -0.3390691  0.3496885  -0.970 0.332325
## hormone_scr_ert_mean              -0.0007175  0.0011445  -0.627 0.530757
## hormone_sal_end_min_since_midnight 0.0004151  0.0001218   3.408 0.000665 ***
## interview_age                     -0.0030135  0.0027677  -1.089 0.276352
## bmi                                0.0189104  0.0053095   3.562 0.000376 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0124
## lmer.REML = 7006.8  Scale est. = 0.79307   n = 2467
```

Male participants

```
##
```

```
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##     interview_age + bmi
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        -0.0454415  0.3149612  -0.144   0.8853
## hormone_scr_ert_mean               -0.0024521  0.0010759  -2.279   0.0227 *
## hormone_sal_end_min_since_midnight  0.0001388  0.0001124   1.235   0.2169
## interview_age                       0.0002110  0.0025073   0.084   0.9329
## bmi                                 0.0032485  0.0049567   0.655   0.5123
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000771
## lmer.REML = 7494.6  Scale est. = 0.78784   n = 2696
```

4—Internalizing~Puberty x Reward—

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * accumbens_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                       Estimate Std. Error t value
## (Intercept)                          2.771e+00  2.676e+00   1.036
## PDS_score                            7.323e-01  2.745e-01   2.667
## hormone_sal_end_min_since_midnight   6.389e-04  8.027e-04   0.796
## hormone_scr_ert_mean                 2.196e-03  7.631e-03   0.288
## accumbens_rvsn_ant_z                -1.427e-01  3.943e-01  -0.362
## race.ethnicity.5levelBlack           8.486e-02  1.123e+00   0.076
## race.ethnicity.5levelMixed           1.240e+00  1.093e+00   1.134
## race.ethnicity.5levelOther           5.485e-01  1.229e+00   0.446
## race.ethnicity.5levelWhite           1.439e+00  1.031e+00   1.396
## demo_race_hispanic1                 -3.152e-02  4.217e-01  -0.075
## interview_age                        7.803e-03  1.740e-02   0.448
## MRI_minus_hormone_date_time          2.141e-05  1.859e-05   1.152
## bmi                                  7.566e-03  3.750e-02   0.202
## household.income[>=200K]            -3.091e+00  1.026e+00  -3.011
## household.income[100K-200K]         -2.657e+00  9.707e-01  -2.738
## household.income[12K-16K]           -5.601e-01  1.255e+00  -0.446
## household.income[16K-25K]            3.426e-01  1.068e+00   0.321
## household.income[25K-35K]           -8.239e-01  1.048e+00  -0.787
## household.income[35K-50K]           -7.859e-01  1.016e+00  -0.773
## household.income[50K-75K]           -2.109e+00  9.677e-01  -2.179
## household.income[5K-12K]             1.993e-01  1.111e+00   0.179
## household.income[75K-100K]          -2.772e+00  9.884e-01  -2.804
## high.educBachelor                    1.065e+00  9.783e-01   1.088
## high.educHS Diploma/GED             -1.211e+00  1.003e+00  -1.207
## high.educPost Graduate Degree        2.045e-01  9.805e-01   0.209
## high.educSome College                6.338e-01  9.348e-01   0.678
## hormone_scr_ert_mean:accumbens_rvsn_ant_z  2.334e-03  1.120e-02   0.208
##                                      Pr(>|t|)
## (Intercept)                           0.30054
## PDS_score                             0.00772 **
## hormone_sal_end_min_since_midnight    0.42618
## hormone_scr_ert_mean                  0.77354
## accumbens_rvsn_ant_z                  0.71738
## race.ethnicity.5levelBlack            0.93979
## race.ethnicity.5levelMixed            0.25683
## race.ethnicity.5levelOther            0.65551
## race.ethnicity.5levelWhite            0.16290
```

```
## demo_race_hispanic1                               0.94043
## interview_age                                      0.65390
## MRI_minus_hormone_date_time                        0.24949
## bmi                                                0.84011
## household.income[>=200K]                           0.00264 **
## household.income[100K-200K]                        0.00625 **
## household.income[12K-16K]                          0.65558
## household.income[16K-25K]                          0.74852
## household.income[25K-35K]                          0.43166
## household.income[35K-50K]                          0.43939
## household.income[50K-75K]                          0.02948 *
## household.income[5K-12K]                           0.85760
## household.income[75K-100K]                         0.00510 **
## high.educBachelor                                  0.27666
## high.educHS Diploma/GED                            0.22763
## high.educPost Graduate Degree                      0.83483
## high.educSome College                              0.49787
## hormone_scr_ert_mean:accumbens_rvsn_ant_z          0.83490
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.037
## lmer.REML =  10545  Scale est. = 11.842    n = 1701
```

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##       hormone_scr_ert_mean * caudate_rvsn_ant_z + race.ethnicity.5level +
##       demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##       bmi + household.income + high.educ
##
## Parametric coefficients:
##                                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)                             2.502e+00  2.671e+00   0.937  0.34900
## PDS_score                               7.198e-01  2.767e-01   2.602  0.00936
## hormone_sal_end_min_since_midnight      5.801e-04  8.022e-04   0.723  0.46969
## hormone_scr_ert_mean                    7.263e-04  7.839e-03   0.093  0.92619
## caudate_rvsn_ant_z                      1.763e-01  2.913e-01   0.605  0.54526
## race.ethnicity.5levelBlack              1.206e-01  1.122e+00   0.107  0.91443
## race.ethnicity.5levelMixed              1.317e+00  1.093e+00   1.205  0.22841
## race.ethnicity.5levelOther              4.776e-01  1.229e+00   0.389  0.69756
## race.ethnicity.5levelWhite              1.474e+00  1.032e+00   1.428  0.15339
## demo_race_hispanic1                     5.246e-02  4.245e-01   0.124  0.90166
## interview_age                           8.489e-03  1.745e-02   0.486  0.62673
## MRI_minus_hormone_date_time             1.929e-05  1.814e-05   1.063  0.28776
## bmi                                     1.143e-02  3.770e-02   0.303  0.76181
## household.income[>=200K]               -2.958e+00  1.017e+00  -2.909  0.00367
## household.income[100K-200K]            -2.452e+00  9.602e-01  -2.554  0.01074
## household.income[12K-16K]               1.362e-02  1.258e+00   0.011  0.99136
## household.income[16K-25K]               6.614e-01  1.058e+00   0.625  0.53178
## household.income[25K-35K]              -5.718e-01  1.041e+00  -0.549  0.58290
## household.income[35K-50K]              -6.460e-01  1.007e+00  -0.642  0.52125
## household.income[50K-75K]              -1.824e+00  9.573e-01  -1.905  0.05690
## household.income[5K-12K]                5.436e-01  1.106e+00   0.492  0.62310
## household.income[75K-100K]             -2.500e+00  9.766e-01  -2.560  0.01056
## high.educBachelor                       1.062e+00  9.631e-01   1.103  0.27026
## high.educHS Diploma/GED                -1.268e+00  9.885e-01  -1.283  0.19964
## high.educPost Graduate Degree           2.299e-01  9.663e-01   0.238  0.81197
## high.educSome College                   6.075e-01  9.208e-01   0.660  0.50950
## hormone_scr_ert_mean:caudate_rvsn_ant_z -2.689e-03  7.909e-03  -0.340  0.73393
##
## (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) =  0.0378
## lmer.REML =  10581  Scale est. = 11.83     n = 1706
```

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * putamen_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)                             2.680e+00  2.675e+00   1.002  0.31650
## PDS_score                               7.446e-01  2.781e-01   2.677  0.00749
## hormone_sal_end_min_since_midnight      6.084e-04  8.046e-04   0.756  0.44960
## hormone_scr_ert_mean                    1.160e-03  7.759e-03   0.149  0.88119
## putamen_rvsn_ant_z                     -1.276e-01  3.133e-01  -0.407  0.68390
## race.ethnicity.5levelBlack              1.794e-01  1.124e+00   0.160  0.87317
## race.ethnicity.5levelMixed              1.291e+00  1.096e+00   1.178  0.23881
## race.ethnicity.5levelOther              5.017e-01  1.231e+00   0.407  0.68372
## race.ethnicity.5levelWhite              1.443e+00  1.034e+00   1.396  0.16300
## demo_race_hispanic1                     3.289e-02  4.234e-01   0.078  0.93809
## interview_age                           6.110e-03  1.749e-02   0.349  0.72689
## MRI_minus_hormone_date_time             2.170e-05  1.821e-05   1.191  0.23373
## bmi                                     9.646e-03  3.782e-02   0.255  0.79870
## household.income[>=200K]               -2.969e+00  1.017e+00  -2.920  0.00355
## household.income[100K-200K]            -2.517e+00  9.599e-01  -2.622  0.00881
## household.income[12K-16K]              -2.476e-01  1.249e+00  -0.198  0.84296
## household.income[16K-25K]               5.579e-01  1.055e+00   0.529  0.59705
## household.income[25K-35K]              -6.589e-01  1.040e+00  -0.634  0.52624
## household.income[35K-50K]              -7.106e-01  1.007e+00  -0.705  0.48066
## household.income[50K-75K]              -1.873e+00  9.571e-01  -1.957  0.05049
## household.income[5K-12K]                2.463e-01  1.098e+00   0.224  0.82257
## household.income[75K-100K]             -2.534e+00  9.773e-01  -2.592  0.00961
## high.educBachelor                       1.215e+00  9.568e-01   1.270  0.20422
## high.educHS Diploma/GED                -1.171e+00  9.822e-01  -1.193  0.23317
## high.educPost Graduate Degree           3.808e-01  9.604e-01   0.397  0.69177
## high.educSome College                   7.237e-01  9.130e-01   0.793  0.42808
## hormone_scr_ert_mean:putamen_rvsn_ant_z 1.625e-03  8.808e-03   0.185  0.85360
##
## (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) =  0.036
## lmer.REML =  10593  Scale est. = 11.972    n = 1707
```

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

Female participants

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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * accumbens_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                                        Estimate Std. Error
## (Intercept)                                           3.174e+00  2.689e+00
## PDS_score                                             7.382e-01  2.753e-01
## hormone_sal_end_min_since_midnight                    4.993e-04  8.025e-04
## hormone_scr_ert_mean                                  5.866e-04  8.006e-03
## accumbens_posvsneg_feedback_z                        -1.804e-01  3.308e-01
## race.ethnicity.5levelBlack                           -4.153e-03  1.139e+00
## race.ethnicity.5levelMixed                            1.282e+00  1.111e+00
## race.ethnicity.5levelOther                            4.083e-01  1.243e+00
## race.ethnicity.5levelWhite                            1.450e+00  1.050e+00
## demo_race_hispanic1                                   3.986e-02  4.207e-01
## interview_age                                         3.515e-03  1.745e-02
## MRI_minus_hormone_date_time                           1.977e-05  1.861e-05
## bmi                                                   3.019e-02  3.771e-02
## household.income[>=200K]                             -3.371e+00  1.038e+00
## household.income[100K-200K]                          -3.003e+00  9.820e-01
## household.income[12K-16K]                            -7.143e-01  1.254e+00
## household.income[16K-25K]                             1.379e-01  1.076e+00
## household.income[25K-35K]                            -1.045e+00  1.061e+00
## household.income[35K-50K]                            -1.073e+00  1.027e+00
## household.income[50K-75K]                            -2.340e+00  9.801e-01
## household.income[5K-12K]                             -7.126e-02  1.132e+00
## household.income[75K-100K]                           -3.018e+00  1.000e+00
## high.educBachelor                                     1.232e+00  9.615e-01
## high.educHS Diploma/GED                              -1.163e+00  9.878e-01
## high.educPost Graduate Degree                         4.177e-01  9.643e-01
## high.educSome College                                 7.703e-01  9.177e-01
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z   -1.820e-03  8.908e-03
##                                                       t value Pr(>|t|)
## (Intercept)                                             1.180  0.23806
## PDS_score                                               2.682  0.00739 **
## hormone_sal_end_min_since_midnight                      0.622  0.53396
## hormone_scr_ert_mean                                    0.073  0.94160
## accumbens_posvsneg_feedback_z                          -0.545  0.58569
## race.ethnicity.5levelBlack                             -0.004  0.99709
## race.ethnicity.5levelMixed                              1.154  0.24853
## race.ethnicity.5levelOther                              0.329  0.74255
## race.ethnicity.5levelWhite                              1.381  0.16740
```

```
## demo_race_hispanic1                                           0.095  0.92452
## interview_age                                                 0.201  0.84037
## MRI_minus_hormone_date_time                                   1.062  0.28838
## bmi                                                           0.801  0.42339
## household.income[>=200K]                                     -3.246  0.00119 **
## household.income[100K-200K]                                  -3.058  0.00226 **
## household.income[12K-16K]                                    -0.570  0.56905
## household.income[16K-25K]                                     0.128  0.89797
## household.income[25K-35K]                                    -0.985  0.32472
## household.income[35K-50K]                                    -1.045  0.29614
## household.income[50K-75K]                                    -2.387  0.01708 *
## household.income[5K-12K]                                     -0.063  0.94981
## household.income[75K-100K]                                   -3.017  0.00259 **
## high.educBachelor                                            1.282  0.20012
## high.educHS Diploma/GED                                     -1.177  0.23920
## high.educPost Graduate Degree                                0.433  0.66495
## high.educSome College                                        0.839  0.40136
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z  -0.204  0.83813
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0386
## lmer.REML =  10574  Scale est. = 11.66      n = 1705
```

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

Female participants

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


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

50

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * caudate_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                                Estimate Std. Error t value
## (Intercept)                                   2.994e+00  2.685e+00   1.115
## PDS_score                                     7.195e-01  2.752e-01   2.614
## hormone_sal_end_min_since_midnight            8.474e-04  8.035e-04   1.055
## hormone_scr_ert_mean                          1.389e-05  7.642e-03   0.002
## caudate_posvsneg_feedback_z                  -6.034e-02  3.194e-01  -0.189
## race.ethnicity.5levelBlack                    7.936e-02  1.126e+00   0.071
## race.ethnicity.5levelMixed                    1.245e+00  1.094e+00   1.138
## race.ethnicity.5levelOther                    4.106e-01  1.231e+00   0.334
## race.ethnicity.5levelWhite                    1.379e+00  1.034e+00   1.334
## demo_race_hispanic1                           4.431e-02  4.210e-01   0.105
## interview_age                                 3.637e-03  1.751e-02   0.208
## MRI_minus_hormone_date_time                   1.950e-05  1.814e-05   1.075
## bmi                                           1.241e-02  3.764e-02   0.330
## household.income[>=200K]                     -3.017e+00  1.023e+00  -2.949
## household.income[100K-200K]                  -2.606e+00  9.667e-01  -2.695
## household.income[12K-16K]                    -3.927e-01  1.245e+00  -0.315
## household.income[16K-25K]                     4.505e-01  1.065e+00   0.423
## household.income[25K-35K]                    -6.686e-01  1.046e+00  -0.639
## household.income[35K-50K]                    -7.112e-01  1.013e+00  -0.702
## household.income[50K-75K]                    -1.975e+00  9.644e-01  -2.048
## household.income[5K-12K]                     -5.294e-02  1.116e+00  -0.047
## household.income[75K-100K]                   -2.643e+00  9.839e-01  -2.687
## high.educBachelor                             1.189e+00  9.637e-01   1.233
## high.educHS Diploma/GED                      -1.148e+00  9.940e-01  -1.155
## high.educPost Graduate Degree                 3.332e-01  9.666e-01   0.345
## high.educSome College                         6.866e-01  9.191e-01   0.747
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z -8.766e-04  9.066e-03  -0.097
##                                               Pr(>|t|)
## (Intercept)                                    0.26509
## PDS_score                                      0.00903 **
## hormone_sal_end_min_since_midnight             0.29172
## hormone_scr_ert_mean                           0.99855
## caudate_posvsneg_feedback_z                    0.85020
## race.ethnicity.5levelBlack                     0.94380
## race.ethnicity.5levelMixed                     0.25537
## race.ethnicity.5levelOther                     0.73876
## race.ethnicity.5levelWhite                     0.18237
```

```
## demo_race_hispanic1                                   0.91620
## interview_age                                          0.83544
## MRI_minus_hormone_date_time                            0.28246
## bmi                                                    0.74168
## household.income[>=200K]                               0.00323 **
## household.income[100K-200K]                            0.00710 **
## household.income[12K-16K]                              0.75255
## household.income[16K-25K]                              0.67241
## household.income[25K-35K]                              0.52278
## household.income[35K-50K]                              0.48261
## household.income[50K-75K]                              0.04074 *
## household.income[5K-12K]                               0.96218
## household.income[75K-100K]                             0.00729 **
## high.educBachelor                                      0.21759
## high.educHS Diploma/GED                                0.24830
## high.educPost Graduate Degree                          0.73039
## high.educSome College                                  0.45516
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z       0.92298
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0342
## lmer.REML =  10546  Scale est. = 12.343    n = 1698
```

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * putamen_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                              Estimate Std. Error t value
## (Intercept)                                 3.032e+00  2.699e+00   1.124
## PDS_score                                   6.996e-01  2.758e-01   2.537
## hormone_sal_end_min_since_midnight          7.772e-04  8.031e-04   0.968
## hormone_scr_ert_mean                        5.389e-04  7.726e-03   0.070
## putamen_posvsneg_feedback_z                 1.785e-01  3.180e-01   0.561
## race.ethnicity.5levelBlack                  1.162e-01  1.127e+00   0.103
## race.ethnicity.5levelMixed                  1.301e+00  1.096e+00   1.187
## race.ethnicity.5levelOther                  4.693e-01  1.233e+00   0.381
## race.ethnicity.5levelWhite                  1.440e+00  1.035e+00   1.392
## demo_race_hispanic1                        -4.501e-03  4.203e-01  -0.011
## interview_age                               4.147e-03  1.752e-02   0.237
## MRI_minus_hormone_date_time                 1.876e-05  1.817e-05   1.033
## bmi                                         1.778e-02  3.756e-02   0.473
## household.income[>=200K]                   -3.106e+00  1.030e+00  -3.015
## household.income[100K-200K]                -2.715e+00  9.735e-01  -2.789
## household.income[12K-16K]                  -4.731e-01  1.251e+00  -0.378
## household.income[16K-25K]                   3.467e-01  1.075e+00   0.322
## household.income[25K-35K]                  -7.576e-01  1.053e+00  -0.719
## household.income[35K-50K]                  -7.992e-01  1.019e+00  -0.784
## household.income[50K-75K]                  -2.029e+00  9.715e-01  -2.088
## household.income[5K-12K]                   -1.697e-01  1.124e+00  -0.151
## household.income[75K-100K]                 -2.718e+00  9.910e-01  -2.743
## high.educBachelor                           1.066e+00  9.700e-01   1.099
## high.educHS Diploma/GED                    -1.265e+00  1.000e+00  -1.264
## high.educPost Graduate Degree               2.606e-01  9.727e-01   0.268
## high.educSome College                       6.040e-01  9.259e-01   0.652
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -3.084e-03  9.172e-03  -0.336
##                                              Pr(>|t|)
## (Intercept)                                   0.26136
## PDS_score                                     0.01129 *
## hormone_sal_end_min_since_midnight            0.33328
## hormone_scr_ert_mean                          0.94439
## putamen_posvsneg_feedback_z                   0.57455
## race.ethnicity.5levelBlack                    0.91784
## race.ethnicity.5levelMixed                    0.23556
## race.ethnicity.5levelOther                    0.70353
## race.ethnicity.5levelWhite                    0.16424
```

```
## demo_race_hispanic1                              0.99146
## interview_age                                    0.81292
## MRI_minus_hormone_date_time                      0.30197
## bmi                                              0.63613
## household.income[>=200K]                         0.00261 **
## household.income[100K-200K]                      0.00534 **
## household.income[12K-16K]                        0.70525
## household.income[16K-25K]                        0.74718
## household.income[25K-35K]                        0.47199
## household.income[35K-50K]                        0.43306
## household.income[50K-75K]                        0.03694 *
## household.income[5K-12K]                         0.88004
## household.income[75K-100K]                       0.00616 **
## high.educBachelor                               0.27178
## high.educHS Diploma/GED                         0.20627
## high.educPost Graduate Degree                   0.78881
## high.educSome College                           0.51427
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z 0.73672
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0336
## lmer.REML =  10575  Scale est. = 12.653    n = 1702
```

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * lOFC_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          2.271e+00  2.672e+00   0.850   0.3955
## PDS_score                            6.489e-01  2.777e-01   2.337   0.0196 *
## hormone_sal_end_min_since_midnight   5.069e-04  8.034e-04   0.631   0.5282
## hormone_scr_ert_mean                 9.709e-04  7.713e-03   0.126   0.8998
## lOFC_rvsn_ant_z                      2.439e-01  4.607e-01   0.529   0.5966
## race.ethnicity.5levelBlack           3.867e-02  1.135e+00   0.034   0.9728
## race.ethnicity.5levelMixed           1.251e+00  1.102e+00   1.135   0.2567
## race.ethnicity.5levelOther           5.114e-01  1.234e+00   0.414   0.6786
## race.ethnicity.5levelWhite           1.421e+00  1.040e+00   1.365   0.1723
## demo_race_hispanic1                  -1.434e-02  4.224e-01  -0.034   0.9729
```

```
## interview_age                           9.298e-03  1.735e-02   0.536   0.5920
## MRI_minus_hormone_date_time             2.188e-05  1.860e-05   1.176   0.2396
## bmi                                     9.056e-03  3.732e-02   0.243   0.8083
## household.income[>=200K]               -2.457e+00  1.040e+00  -2.363   0.0182 *
## household.income[100K-200K]            -2.029e+00  9.855e-01  -2.059   0.0396 *
## household.income[12K-16K]               1.581e-01  1.275e+00   0.124   0.9013
## household.income[16K-25K]               1.090e+00  1.082e+00   1.007   0.3139
## household.income[25K-35K]              -1.917e-01  1.060e+00  -0.181   0.8565
## household.income[35K-50K]              -1.958e-01  1.028e+00  -0.190   0.8490
## household.income[50K-75K]              -1.471e+00  9.838e-01  -1.496   0.1350
## household.income[5K-12K]                5.744e-01  1.127e+00   0.510   0.6104
## household.income[75K-100K]             -2.122e+00  1.002e+00  -2.117   0.0344 *
## high.educBachelor                       1.029e+00  9.498e-01   1.083   0.2787
## high.educHS Diploma/GED                -1.152e+00  9.855e-01  -1.168   0.2428
## high.educPost Graduate Degree           1.630e-01  9.525e-01   0.171   0.8642
## high.educSome College                   5.182e-01  9.074e-01   0.571   0.5680
## hormone_scr_ert_mean:lOFC_rvsn_ant_z   -1.215e-02  1.242e-02  -0.979   0.3278
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0361
## lmer.REML =  10481  Scale est. = 11.809    n = 1695
```

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * mOFC_rvsn_ant_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       2.639e+00  2.681e+00   0.984  0.32501
## PDS_score                         7.230e-01  2.780e-01   2.601  0.00938 **
## hormone_sal_end_min_since_midnight 3.668e-04  8.042e-04   0.456  0.64837
## hormone_scr_ert_mean              1.697e-03  7.690e-03   0.221  0.82541
## mOFC_rvsn_ant_z                  -1.071e-01  3.958e-01  -0.271  0.78667
## race.ethnicity.5levelBlack        1.460e-01  1.142e+00   0.128  0.89822
## race.ethnicity.5levelMixed        1.230e+00  1.107e+00   1.111  0.26677
## race.ethnicity.5levelOther        5.499e-01  1.243e+00   0.442  0.65820
## race.ethnicity.5levelWhite        1.440e+00  1.047e+00   1.375  0.16920
## demo_race_hispanic1              -3.358e-02  4.233e-01  -0.079  0.93678
## interview_age                     9.823e-03  1.743e-02   0.564  0.57310
```

```
## MRI_minus_hormone_date_time            2.077e-05  1.861e-05   1.116  0.26461
## bmi                                     9.990e-03  3.746e-02   0.267  0.78971
## household.income[>=200K]               -3.073e+00  1.032e+00  -2.978  0.00295 **
## household.income[100K-200K]            -2.687e+00  9.767e-01  -2.751  0.00601 **
## household.income[12K-16K]              -4.988e-01  1.251e+00  -0.399  0.69008
## household.income[16K-25K]               3.713e-01  1.072e+00   0.346  0.72921
## household.income[25K-35K]              -9.452e-01  1.054e+00  -0.897  0.36986
## household.income[35K-50K]              -7.970e-01  1.021e+00  -0.781  0.43497
## household.income[50K-75K]              -2.133e+00  9.734e-01  -2.192  0.02854 *
## household.income[5K-12K]               -5.331e-02  1.122e+00  -0.048  0.96209
## household.income[75K-100K]             -2.734e+00  9.937e-01  -2.752  0.00600 **
## high.educBachelor                       1.159e+00  9.537e-01   1.215  0.22437
## high.educHS Diploma/GED                -1.142e+00  9.870e-01  -1.157  0.24757
## high.educPost Graduate Degree           3.346e-01  9.564e-01   0.350  0.72650
## high.educSome College                   7.304e-01  9.095e-01   0.803  0.42205
## hormone_scr_ert_mean:mOFC_rvsn_ant_z  -2.937e-03  1.093e-02  -0.269  0.78827
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.035
## lmer.REML =  10540  Scale est. = 11.745    n = 1701
```

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * lOFC_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                                Estimate Std. Error t value
## (Intercept)                                   2.750e+00  2.678e+00   1.027
## PDS_score                                     6.804e-01  2.776e-01   2.451
## hormone_sal_end_min_since_midnight            6.034e-04  8.045e-04   0.750
## hormone_scr_ert_mean                          1.266e-03  7.576e-03   0.167
## lOFC_posvsneg_feedback_z                      1.482e-01  5.246e-01   0.283
## race.ethnicity.5levelBlack                    7.055e-02  1.136e+00   0.062
## race.ethnicity.5levelMixed                    1.286e+00  1.107e+00   1.162
## race.ethnicity.5levelOther                    4.346e-01  1.239e+00   0.351
## race.ethnicity.5levelWhite                    1.457e+00  1.046e+00   1.393
## demo_race_hispanic1                           4.469e-02  4.238e-01   0.105
## interview_age                                 4.758e-03  1.741e-02   0.273
## MRI_minus_hormone_date_time                   2.167e-05  1.815e-05   1.194
## bmi                                           1.782e-02  3.758e-02   0.474
## household.income[>=200K]                     -2.862e+00  1.067e+00  -2.682
## household.income[100K-200K]                  -2.462e+00  1.013e+00  -2.429
## household.income[12K-16K]                    -3.845e-01  1.286e+00  -0.299
## household.income[16K-25K]                     7.554e-01  1.117e+00   0.676
## household.income[25K-35K]                    -8.355e-01  1.093e+00  -0.764
## household.income[35K-50K]                    -6.432e-01  1.056e+00  -0.609
## household.income[50K-75K]                    -1.840e+00  1.012e+00  -1.818
## household.income[5K-12K]                      3.997e-01  1.146e+00   0.349
## household.income[75K-100K]                   -2.524e+00  1.030e+00  -2.450
## high.educBachelor                             1.165e+00  9.656e-01   1.206
## high.educHS Diploma/GED                      -9.218e-01  9.950e-01  -0.926
## high.educPost Graduate Degree                 3.419e-01  9.680e-01   0.353
## high.educSome College                         7.374e-01  9.224e-01   0.800
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z -2.146e-03  1.458e-02  -0.147
##                                               Pr(>|t|)
## (Intercept)                                    0.30459
## PDS_score                                      0.01435 *
## hormone_sal_end_min_since_midnight             0.45332
## hormone_scr_ert_mean                           0.86728
## lOFC_posvsneg_feedback_z                       0.77752
## race.ethnicity.5levelBlack                     0.95051
## race.ethnicity.5levelMixed                     0.24542
## race.ethnicity.5levelOther                     0.72584
## race.ethnicity.5levelWhite                     0.16380
```

```
## demo_race_hispanic1                              0.91602
## interview_age                                    0.78463
## MRI_minus_hormone_date_time                      0.23264
## bmi                                              0.63543
## household.income[>=200K]                         0.00738 **
## household.income[100K-200K]                      0.01524 *
## household.income[12K-16K]                        0.76497
## household.income[16K-25K]                        0.49886
## household.income[25K-35K]                        0.44482
## household.income[35K-50K]                        0.54238
## household.income[50K-75K]                        0.06927 .
## household.income[5K-12K]                         0.72722
## household.income[75K-100K]                       0.01437 *
## high.educBachelor                                0.22799
## high.educHS Diploma/GED                          0.35436
## high.educPost Graduate Degree                    0.72397
## high.educSome College                            0.42411
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z    0.88300
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0349
## lmer.REML =  10478  Scale est. = 11.784    n = 1692
```

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

Female participants

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


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

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

Male participants

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


##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * mOFC_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##                                                  Estimate Std. Error t value
## (Intercept)                                      2.644e+00  2.667e+00   0.991
## PDS_score                                        6.847e-01  2.766e-01   2.475
## hormone_sal_end_min_since_midnight               6.088e-04  8.016e-04   0.759
## hormone_scr_ert_mean                             1.278e-03  7.563e-03   0.169
## mOFC_posvsneg_feedback_z                        -4.042e-01  4.300e-01  -0.940
## race.ethnicity.5levelBlack                      -8.472e-03  1.133e+00  -0.007
## race.ethnicity.5levelMixed                       1.289e+00  1.103e+00   1.168
## race.ethnicity.5levelOther                       4.337e-01  1.235e+00   0.351
## race.ethnicity.5levelWhite                       1.448e+00  1.043e+00   1.388
## demo_race_hispanic1                              2.327e-02  4.206e-01   0.055
## interview_age                                    5.961e-03  1.736e-02   0.343
## MRI_minus_hormone_date_time                      2.147e-05  1.862e-05   1.153
## bmi                                              1.956e-02  3.741e-02   0.523
## household.income[>=200K]                        -2.930e+00  1.058e+00  -2.770
## household.income[100K-200K]                     -2.518e+00  1.004e+00  -2.508
## household.income[12K-16K]                       -3.341e-01  1.268e+00  -0.264
## household.income[16K-25K]                        6.849e-01  1.096e+00   0.625
## household.income[25K-35K]                       -8.919e-01  1.084e+00  -0.823
## household.income[35K-50K]                       -6.815e-01  1.046e+00  -0.651
## household.income[50K-75K]                       -1.874e+00  1.001e+00  -1.871
## household.income[5K-12K]                         3.533e-01  1.136e+00   0.311
## household.income[75K-100K]                      -2.570e+00  1.020e+00  -2.519
## high.educBachelor                                1.147e+00  9.552e-01   1.201
## high.educHS Diploma/GED                         -9.530e-01  9.830e-01  -0.969
## high.educPost Graduate Degree                    3.448e-01  9.577e-01   0.360
## high.educSome College                            7.311e-01  9.110e-01   0.803
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z    8.773e-03  1.190e-02   0.737
##                                                  Pr(>|t|)
## (Intercept)                                       0.32171
## PDS_score                                         0.01343 *
## hormone_sal_end_min_since_midnight                0.44769
## hormone_scr_ert_mean                              0.86583
## mOFC_posvsneg_feedback_z                          0.34739
## race.ethnicity.5levelBlack                        0.99403
## race.ethnicity.5levelMixed                        0.24305
## race.ethnicity.5levelOther                        0.72546
## race.ethnicity.5levelWhite                        0.16521
```

```
## demo_race_hispanic1                              0.95589
## interview_age                                     0.73131
## MRI_minus_hormone_date_time                       0.24905
## bmi                                               0.60115
## household.income[>=200K]                          0.00567 **
## household.income[100K-200K]                       0.01223 *
## household.income[12K-16K]                         0.79215
## household.income[16K-25K]                         0.53203
## household.income[25K-35K]                         0.41077
## household.income[35K-50K]                         0.51493
## household.income[50K-75K]                         0.06148 .
## household.income[5K-12K]                          0.75594
## household.income[75K-100K]                        0.01185 *
## high.educBachelor                                 0.22995
## high.educHS Diploma/GED                           0.33244
## high.educPost Graduate Degree                     0.71885
## high.educSome College                             0.42237
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z     0.46117
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0355
## lmer.REML =  10511  Scale est. = 11.805    n = 1698
```

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

Female participants

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

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

Male participants

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

```
## 
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * bisbas_ss_basm_rr + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
## 
## Parametric coefficients:
##                                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          2.8823745  2.4125872   1.195 0.232314
## PDS_score                            0.5981364  0.2200156   2.719 0.006603
## hormone_sal_end_min_since_midnight   0.0011601  0.0006766   1.715 0.086545
## hormone_scr_ert_mean                 0.0240143  0.0260448   0.922 0.356602
## bisbas_ss_basm_rr                   -0.0190152  0.1047508  -0.182 0.855969
## race.ethnicity.5levelBlack          -0.6656325  0.8938779  -0.745 0.456553
## race.ethnicity.5levelMixed           1.0748968  0.8695751   1.236 0.216537
## race.ethnicity.5levelOther           0.1447526  0.9883103   0.146 0.883567
## race.ethnicity.5levelWhite           1.0226429  0.8181142   1.250 0.211422
## demo_race_hispanic1                 -0.0632104  0.3563479  -0.177 0.859222
## interview_age                        0.0037385  0.0149618   0.250 0.802709
## bmi                                  0.0316200  0.0310723   1.018 0.308959
## household.income[>=200K]            -3.1130959  0.8498876  -3.663 0.000255
## household.income[100K-200K]         -2.5637453  0.7950812  -3.225 0.001279
## household.income[12K-16K]           -0.1593036  1.0342127  -0.154 0.877596
## household.income[16K-25K]            0.0392931  0.8510919   0.046 0.963180
## household.income[25K-35K]           -0.6775536  0.8515271  -0.796 0.426290
## household.income[35K-50K]           -1.2422863  0.8093078  -1.535 0.124917
## household.income[50K-75K]           -1.6656363  0.7855496  -2.120 0.034080
## household.income[5K-12K]            -0.1289753  0.8776657  -0.147 0.883182
## household.income[75K-100K]          -2.6859656  0.8097189  -3.317 0.000923
## high.educBachelor                    1.2845739  0.7930897   1.620 0.105428
## high.educHS Diploma/GED             -0.7563517  0.7848559  -0.964 0.335303
## high.educPost Graduate Degree        0.5271355  0.7968473   0.662 0.508339
## high.educSome College                0.8915772  0.7549226   1.181 0.237714
## hormone_scr_ert_mean:bisbas_ss_basm_rr -0.0021454  0.0028848  -0.744 0.457146
## 
## (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) =  0.0361
## lmer.REML =  14916  Scale est. = 14.67     n = 2404
```

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

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * rt_diff_large_neutral_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                    Estimate Std. Error t value
## (Intercept)                       -5.919e-01  2.465e+00  -0.240
## PDS_score                          8.775e-01  1.968e-01   4.458
## hormone_sal_end_min_since_midnight -7.511e-05  7.541e-04  -0.100
## hormone_scr_ert_mean              -5.404e-03  6.966e-03  -0.776
## rt_diff_large_neutral_z           -7.710e-02  2.932e-01  -0.263
## race.ethnicity.5levelBlack        -1.085e+00  8.677e-01  -1.250
## race.ethnicity.5levelMixed         5.716e-01  8.367e-01   0.683
## race.ethnicity.5levelOther        -6.458e-01  9.805e-01  -0.659
## race.ethnicity.5levelWhite         1.131e+00  7.756e-01   1.458
## demo_race_hispanic1               -9.153e-02  3.875e-01  -0.236
## interview_age                      2.889e-02  1.747e-02   1.654
## bmi                                3.682e-02  3.439e-02   1.071
## household.income[>=200K]          -2.293e+00  9.328e-01  -2.459
## household.income[100K-200K]       -1.395e+00  8.659e-01  -1.610
## household.income[12K-16K]         -2.539e-01  1.110e+00  -0.229
## household.income[16K-25K]         -1.221e+00  9.695e-01  -1.259
## household.income[25K-35K]          2.391e-01  9.051e-01   0.264
## household.income[35K-50K]         -8.198e-01  8.802e-01  -0.931
## household.income[50K-75K]         -1.205e+00  8.657e-01  -1.392
## household.income[5K-12K]           2.034e-01  1.033e+00   0.197
## household.income[75K-100K]        -1.199e+00  8.799e-01  -1.363
```

```
## high.educBachelor                              3.935e-01  8.149e-01   0.483
## high.educHS Diploma/GED                         4.196e-01  8.267e-01   0.508
## high.educPost Graduate Degree                   8.326e-01  8.301e-01   1.003
## high.educSome College                           9.340e-01  7.654e-01   1.220
## hormone_scr_ert_mean:rt_diff_large_neutral_z    7.728e-03  7.340e-03   1.053
##                                               Pr(>|t|)
## (Intercept)                                     0.8103
## PDS_score                                     8.76e-06 ***
## hormone_sal_end_min_since_midnight              0.9207
## hormone_scr_ert_mean                            0.4380
## rt_diff_large_neutral_z                         0.7926
## race.ethnicity.5levelBlack                      0.2113
## race.ethnicity.5levelMixed                      0.4946
## race.ethnicity.5levelOther                      0.5102
## race.ethnicity.5levelWhite                      0.1450
## demo_race_hispanic1                             0.8133
## interview_age                                   0.0984 .
## bmi                                             0.2845
## household.income[>=200K]                        0.0140 *
## household.income[100K-200K]                     0.1075
## household.income[12K-16K]                       0.8190
## household.income[16K-25K]                       0.2081
## household.income[25K-35K]                       0.7917
## household.income[35K-50K]                       0.3517
## household.income[50K-75K]                       0.1640
## household.income[5K-12K]                        0.8440
## household.income[75K-100K]                      0.1730
## high.educBachelor                               0.6293
## high.educHS Diploma/GED                         0.6118
## high.educPost Graduate Degree                   0.3160
## high.educSome College                           0.2225
## hormone_scr_ert_mean:rt_diff_large_neutral_z    0.2926
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =   0.03
## lmer.REML =  11483  Scale est. = 16.534    n = 1868
```

Male participants

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

```
## (Intercept)                                    1.0296368  2.5233365   0.408
## PDS_score                                      0.7768281  0.2517609   3.086
## hormone_sal_end_min_since_midnight             0.0011680  0.0007448   1.568
## hormone_scr_ert_mean                           0.0037854  0.0072520   0.522
## rt_diff_large_neutral_z                       -0.1588345  0.2836580  -0.560
## race.ethnicity.5levelBlack                    -0.6601995  1.0838737  -0.609
## race.ethnicity.5levelMixed                     0.7543348  1.0588690   0.712
## race.ethnicity.5levelOther                    -0.0688494  1.1734097  -0.059
## race.ethnicity.5levelWhite                     0.9037856  1.0019024   0.902
## demo_race_hispanic1                           -0.0254350  0.3957240  -0.064
## interview_age                                  0.0065581  0.0163922   0.400
## bmi                                            0.0278896  0.0351054   0.794
## household.income[>=200K]                      -1.9514376  0.9711297  -2.009
## household.income[100K-200K]                   -1.5986046  0.9171859  -1.743
## household.income[12K-16K]                      1.0775088  1.1622717   0.927
## household.income[16K-25K]                      1.5504465  1.0025044   1.547
## household.income[25K-35K]                      0.3592813  0.9854575   0.365
## household.income[35K-50K]                      0.3296332  0.9379599   0.351
## household.income[50K-75K]                     -0.7920720  0.9102151  -0.870
## household.income[5K-12K]                       0.9229868  1.0333661   0.893
## household.income[75K-100K]                    -1.5744817  0.9328065  -1.688
## high.educBachelor                              1.5303968  0.9087816   1.684
## high.educHS Diploma/GED                       -0.0731975  0.9182883  -0.080
## high.educPost Graduate Degree                  0.7915414  0.9098354   0.870
## high.educSome College                          0.9892388  0.8639197   1.145
## hormone_scr_ert_mean:rt_diff_large_neutral_z   0.0032903  0.0076821   0.428
##                                               Pr(>|t|)
## (Intercept)                                    0.68329
## PDS_score                                      0.00206 **
## hormone_sal_end_min_since_midnight             0.11699
## hormone_scr_ert_mean                           0.60175
## rt_diff_large_neutral_z                        0.57558
## race.ethnicity.5levelBlack                     0.54252
## race.ethnicity.5levelMixed                     0.47631
## race.ethnicity.5levelOther                     0.95322
## race.ethnicity.5levelWhite                     0.36713
## demo_race_hispanic1                            0.94876
## interview_age                                  0.68914
## bmi                                            0.42703
## household.income[>=200K]                       0.04463 *
## household.income[100K-200K]                    0.08150 .
## household.income[12K-16K]                      0.35401
## household.income[16K-25K]                      0.12213
## household.income[25K-35K]                      0.71546
## household.income[35K-50K]                      0.72530
## household.income[50K-75K]                      0.38430
## household.income[5K-12K]                       0.37187
## household.income[75K-100K]                     0.09159 .
## high.educBachelor                              0.09234 .
## high.educHS Diploma/GED                        0.93648
## high.educPost Graduate Degree                  0.38442
## high.educSome College                          0.25233
## hormone_scr_ert_mean:rt_diff_large_neutral_z   0.66848
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0347
## lmer.REML =  11967  Scale est. = 11.146    n = 1934
```

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

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * rt_diff_large_small_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##                                         Estimate Std. Error t value
## (Intercept)                           -0.5751339  2.4658391  -0.233
## PDS_score                              0.8886604  0.1967627   4.516
## hormone_sal_end_min_since_midnight    -0.0001197  0.0007540  -0.159
## hormone_scr_ert_mean                  -0.0050217  0.0069569  -0.722
## rt_diff_large_small_z                  0.2312833  0.2718637   0.851
## race.ethnicity.5levelBlack            -1.0443732  0.8682944  -1.203
## race.ethnicity.5levelMixed             0.6180054  0.8372683   0.738
## race.ethnicity.5levelOther            -0.5995807  0.9808293  -0.611
## race.ethnicity.5levelWhite             1.1741796  0.7757453   1.514
## demo_race_hispanic1                   -0.1000577  0.3877051  -0.258
## interview_age                          0.0291308  0.0174651   1.668
## bmi                                    0.0344820  0.0344263   1.002
## household.income[>=200K]              -2.3520327  0.9333746  -2.520
## household.income[100K-200K]           -1.4703571  0.8658445  -1.698
## household.income[12K-16K]             -0.2809195  1.1095318  -0.253
## household.income[16K-25K]             -1.3068949  0.9698954  -1.347
## household.income[25K-35K]              0.2152456  0.9051866   0.238
## household.income[35K-50K]             -0.9001209  0.8805251  -1.022
## household.income[50K-75K]             -1.2791778  0.8660380  -1.477
## household.income[5K-12K]               0.1596565  1.0340240   0.154
## household.income[75K-100K]            -1.2804102  0.8799877  -1.455
## high.educBachelor                      0.4266245  0.8153470   0.523
## high.educHS Diploma/GED                0.4279947  0.8274260   0.517
## high.educPost Graduate Degree          0.8708899  0.8316583   1.047
## high.educSome College                  0.9809652  0.7664068   1.280
## hormone_scr_ert_mean:rt_diff_large_small_z -0.0005874  0.0070154  -0.084
##                                         Pr(>|t|)
## (Intercept)                               0.8156
## PDS_score                               6.69e-06 ***
## hormone_sal_end_min_since_midnight        0.8739
```

```
## hormone_scr_ert_mean                              0.4705
## rt_diff_large_small_z                             0.3950
## race.ethnicity.5levelBlack                        0.2292
## race.ethnicity.5levelMixed                        0.4605
## race.ethnicity.5levelOther                        0.5411
## race.ethnicity.5levelWhite                        0.1303
## demo_race_hispanic1                               0.7964
## interview_age                                     0.0955 .
## bmi                                               0.3167
## household.income[>=200K]                          0.0118 *
## household.income[100K-200K]                       0.0896 .
## household.income[12K-16K]                         0.8002
## household.income[16K-25K]                         0.1780
## household.income[25K-35K]                         0.8121
## household.income[35K-50K]                         0.3068
## household.income[50K-75K]                         0.1398
## household.income[5K-12K]                          0.8773
## household.income[75K-100K]                        0.1458
## high.educBachelor                                 0.6009
## high.educHS Diploma/GED                           0.6050
## high.educPost Graduate Degree                     0.2952
## high.educSome College                             0.2007
## hormone_scr_ert_mean:rt_diff_large_small_z        0.9333
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0299
## lmer.REML =  11484  Scale est. = 16.493    n = 1868
```

Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##      hormone_scr_ert_mean * rt_diff_large_small_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age + bmi + household.income +
##      high.educ
##
## Parametric coefficients:
##                                    Estimate Std. Error t value
## (Intercept)                        1.0919753  2.5210611   0.433
## PDS_score                          0.7826728  0.2517088   3.109
## hormone_sal_end_min_since_midnight 0.0011584  0.0007444   1.556
## hormone_scr_ert_mean               0.0040498  0.0072580   0.558
## rt_diff_large_small_z              0.1255700  0.2760729   0.455
## race.ethnicity.5levelBlack        -0.6555003  1.0838203  -0.605
## race.ethnicity.5levelMixed         0.7591876  1.0584793   0.717
## race.ethnicity.5levelOther        -0.0635590  1.1735717  -0.054
## race.ethnicity.5levelWhite         0.9179138  1.0011942   0.917
```

```
## demo_race_hispanic1                            -0.0219746  0.3961459  -0.055
## interview_age                                   0.0061515  0.0163773   0.376
## bmi                                             0.0274678  0.0351082   0.782
## household.income[>=200K]                       -1.9819009  0.9710110  -2.041
## household.income[100K-200K]                    -1.6248224  0.9176668  -1.771
## household.income[12K-16K]                       1.0697508  1.1625064   0.920
## household.income[16K-25K]                       1.5028274  1.0046815   1.496
## household.income[25K-35K]                       0.3366520  0.9865632   0.341
## household.income[35K-50K]                       0.2875563  0.9380762   0.307
## household.income[50K-75K]                      -0.8192698  0.9101862  -0.900
## household.income[5K-12K]                        0.9157995  1.0336012   0.886
## household.income[75K-100K]                     -1.6061643  0.9333514  -1.721
## high.educBachelor                               1.5263036  0.9088612   1.679
## high.educHS Diploma/GED                        -0.0566649  0.9174417  -0.062
## high.educPost Graduate Degree                   0.7926171  0.9098236   0.871
## high.educSome College                           0.9915042  0.8637032   1.148
## hormone_scr_ert_mean:rt_diff_large_small_z -0.0045577  0.0075563  -0.603
##                                            Pr(>|t|)
## (Intercept)                                  0.6650
## PDS_score                                    0.0019 **
## hormone_sal_end_min_since_midnight           0.1198
## hormone_scr_ert_mean                         0.5769
## rt_diff_large_small_z                        0.6493
## race.ethnicity.5levelBlack                   0.5454
## race.ethnicity.5levelMixed                   0.4733
## race.ethnicity.5levelOther                   0.9568
## race.ethnicity.5levelWhite                   0.3594
## demo_race_hispanic1                          0.9558
## interview_age                                0.7072
## bmi                                          0.4341
## household.income[>=200K]                     0.0414 *
## household.income[100K-200K]                  0.0768 .
## household.income[12K-16K]                    0.3576
## household.income[16K-25K]                    0.1349
## household.income[25K-35K]                    0.7330
## household.income[35K-50K]                    0.7592
## household.income[50K-75K]                    0.3682
## household.income[5K-12K]                     0.3757
## household.income[75K-100K]                   0.0854 .
## high.educBachelor                            0.0932 .
## high.educHS Diploma/GED                      0.9508
## high.educPost Graduate Degree                0.3838
## high.educSome College                        0.2511
## hormone_scr_ert_mean:rt_diff_large_small_z  0.5465
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0345
## lmer.REML =  11967  Scale est. = 11.082    n = 1934
```