

# Supplement D

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

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## Sensitivity Analysis Results for Sample 2

### 1—Int~Puberty—

#### 1.1 Model: CBCL internalizing factor ~ PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ 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)      0.24585    2.14625   0.115 0.908813
## PDS_score         0.63910    0.16994   3.761 0.000173 ***
## race.ethnicity.5levelBlack -0.59950    0.80357  -0.746 0.455719
## race.ethnicity.5levelMixed  1.16125    0.78203   1.485 0.137698
## race.ethnicity.5levelOther -0.07551    0.91532  -0.082 0.934261
## race.ethnicity.5levelWhite  1.16079    0.72966   1.591 0.111774
## interview_age      0.02398    0.01551   1.546 0.122175
## bmi               0.02183    0.03081   0.708 0.478737
## household.income[>=200K] -2.48695    0.84306  -2.950 0.003210 **
## household.income[100K-200K] -1.53646    0.78498  -1.957 0.050425 .
## household.income[12K-16K]  -0.16447    1.00678  -0.163 0.870247
## household.income[16K-25K]  -1.19402    0.86844  -1.375 0.169291
## household.income[25K-35K]   0.06806    0.82129   0.083 0.933964
## household.income[35K-50K]  -1.23125    0.79766  -1.544 0.122825
## household.income[50K-75K]  -1.17459    0.78183  -1.502 0.133139
## household.income[5K-12K]    0.01842    0.88108   0.021 0.983323
## household.income[75K-100K] -1.20384    0.79552  -1.513 0.130345
## high.educBachelor    0.71480    0.72727   0.983 0.325782
## high.educHS Diploma/GED  0.57208    0.72972   0.784 0.433137
## high.educPost Graduate Degree 1.07092    0.74080   1.446 0.148410
## high.educSome College   0.98398    0.67857   1.450 0.147167
## demo_race_hispanic1     0.01775    0.35033   0.051 0.959598
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0208
## lmer.REML = 14752 Scale est. = 17.681    n = 2393
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ 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)      3.044498    2.131388   1.428 0.153296
## PDS_score         0.512599    0.212901   2.408 0.016124 *
## race.ethnicity.5levelBlack -0.568285    0.870652  -0.653 0.514000
## race.ethnicity.5levelMixed  1.136350    0.851619   1.334 0.182211
## race.ethnicity.5levelOther  0.054732    0.970214   0.056 0.955017
## race.ethnicity.5levelWhite  0.882675    0.800878   1.102 0.270507
## interview_age      0.008395    0.014671   0.572 0.567222
## bmi               0.037559    0.030231   1.242 0.214196
## household.income[>=200K] -3.163233    0.817766  -3.868 0.000112 ***
```

```
## household.income[100K-200K] -2.503348 0.762024 -3.285 0.001033 **
## household.income[12K-16K] -0.378147 0.978855 -0.386 0.699295
## household.income[16K-25K] 0.014172 0.819181 0.017 0.986199
## household.income[25K-35K] -0.080763 0.820882 -0.098 0.921634
## household.income[35K-50K] -1.125521 0.777542 -1.448 0.147869
## household.income[50K-75K] -1.612009 0.754947 -2.135 0.032834 *
## household.income[5K-12K] -0.081314 0.858409 -0.095 0.924540
## household.income[75K-100K] -2.674947 0.776687 -3.444 0.000582 ***
## high.educBachelor 1.510458 0.769450 1.963 0.049750 *
## high.educHS Diploma/GED -0.861459 0.762395 -1.130 0.258608
## high.educPost Graduate Degree 0.758055 0.772636 0.981 0.326622
## high.educSome College 0.987835 0.731158 1.351 0.176797
## demo_race_hispanic1 0.139213 0.348535 0.399 0.689615
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0356
## lmer.REML = 16057 Scale est. = 16.188 n = 2582
```

## 1.2 Model: CBCL Anxious-Depressed ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ 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) 0.571226 1.208616 0.473 0.6365
## PDS_score 0.289623 0.095677 3.027 0.0025 **
## race.ethnicity.5levelBlack -0.208973 0.450502 -0.464 0.6428
## race.ethnicity.5levelMixed 0.779587 0.438563 1.778 0.0756 .
## race.ethnicity.5levelOther 0.149325 0.513557 0.291 0.7713
## race.ethnicity.5levelWhite 0.701081 0.409125 1.714 0.0867 .
## interview_age 0.009063 0.008759 1.035 0.3009
## bmi -0.010226 0.017333 -0.590 0.5552
## household.income[>=200K] -0.915799 0.472779 -1.937 0.0529 .
## household.income[100K-200K] -0.373934 0.440145 -0.850 0.3957
## household.income[12K-16K] -0.026541 0.564057 -0.047 0.9625
## household.income[16K-25K] -0.526282 0.487490 -1.080 0.2804
## household.income[25K-35K] 0.199691 0.460614 0.434 0.6647
## household.income[35K-50K] -0.325213 0.447435 -0.727 0.4674
## household.income[50K-75K] -0.226284 0.438393 -0.516 0.6058
## household.income[5K-12K] 0.123800 0.494970 0.250 0.8025
## household.income[75K-100K] -0.200656 0.446142 -0.450 0.6529
## high.educBachelor 0.149894 0.407184 0.368 0.7128
## high.educHS Diploma/GED -0.047246 0.408926 -0.116 0.9080
## high.educPost Graduate Degree 0.557669 0.414778 1.344 0.1789
## high.educSome College 0.379274 0.379997 0.998 0.3183
```

```
## demo_race_hispanic1          0.127401   0.195756   0.651   0.5152
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0156
## lmer.REML = 12037  Scale est. = 6.6943    n = 2393
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ 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)    2.265806   1.198585   1.890  0.05882 .
## PDS_score       0.266298   0.119891   2.221  0.02643 *
## race.ethnicity.5levelBlack -0.127691   0.484971  -0.263  0.79234
## race.ethnicity.5levelMixed  0.622860   0.474210   1.313  0.18914
## race.ethnicity.5levelOther  0.283154   0.542267   0.522  0.60160
## race.ethnicity.5levelWhite  0.617047   0.445773   1.384  0.16641
## interview_age  -0.006789   0.008280  -0.820  0.41234
## bmi             0.005526   0.017022   0.325  0.74548
## household.income[>=200K] -1.283218   0.457060  -2.808  0.00503 **
## household.income[100K-200K] -0.935027   0.426068  -2.195  0.02829 *
## household.income[12K-16K]  -0.096237   0.547581  -0.176  0.86050
## household.income[16K-25K]  -0.015610   0.458430  -0.034  0.97284
## household.income[25K-35K]   0.059470   0.459643   0.129  0.89706
## household.income[35K-50K]  -0.275088   0.434876  -0.633  0.52707
## household.income[50K-75K]  -0.690488   0.422258  -1.635  0.10212
## household.income[5K-12K]    0.052185   0.480316   0.109  0.91349
## household.income[75K-100K] -0.957038   0.434131  -2.204  0.02758 *
## high.educBachelor    1.193167   0.430813   2.770  0.00565 **
## high.educHS Diploma/GED -0.192115   0.427126  -0.450  0.65290
## high.educPost Graduate Degree 0.852858   0.432532   1.972  0.04874 *
## high.educSome College   0.731303   0.409636   1.785  0.07434 .
## demo_race_hispanic1    0.177569   0.194994   0.911  0.36257
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0194
## lmer.REML = 13124  Scale est. = 6.6679    n = 2582
```

## 1.3 Model: CBCL Withdrawn-Depressed ~ PDS

### Females

```
##
## Family: gaussian
```



```

## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ 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)      0.597114   0.631420   0.946 0.344413
## PDS_score         0.167783   0.049930   3.360 0.000791 ***
## race.ethnicity.5levelBlack -0.405523   0.234501  -1.729 0.083884 .
## race.ethnicity.5levelMixed -0.037332   0.228166  -0.164 0.870046
## race.ethnicity.5levelOther -0.296675   0.267095  -1.111 0.266789
## race.ethnicity.5levelWhite -0.075008   0.213035  -0.352 0.724800
## interview_age      0.003785   0.004588   0.825 0.409541
## bmi               0.010756   0.009034   1.191 0.233957
## household.income[>=200K] -0.790678   0.245498  -3.221 0.001296 **
## household.income[100K-200K] -0.567993   0.228434  -2.486 0.012970 *
## household.income[12K-16K] -0.250379   0.292350  -0.856 0.391845
## household.income[16K-25K] -0.358819   0.253532  -1.415 0.157117
## household.income[25K-35K] -0.008874   0.239098  -0.037 0.970398
## household.income[35K-50K] -0.527085   0.232381  -2.268 0.023407 *
## household.income[50K-75K] -0.477302   0.227514  -2.098 0.036019 *
## household.income[5K-12K] -0.047157   0.257508  -0.183 0.854714
## household.income[75K-100K] -0.483750   0.231611  -2.089 0.036848 *
## high.educBachelor    -0.025672   0.210861  -0.122 0.903110
## high.educHS Diploma/GED  0.204823   0.212147   0.965 0.334405
## high.educPost Graduate Degree -0.006554   0.214832  -0.031 0.975666
## high.educSome College  -0.004270   0.196842  -0.022 0.982694
## demo_race_hispanic1    -0.004556   0.101595  -0.045 0.964235
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0224
## lmer.REML =  8972  Scale est. = 2.2943    n = 2393

```

## Males

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ 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)      0.368632   0.692242   0.533 0.594412
## PDS_score         0.128798   0.069425   1.855 0.063681 .
## race.ethnicity.5levelBlack -0.154051   0.281906  -0.546 0.584796
## race.ethnicity.5levelMixed  0.262650   0.276050   0.951 0.341463
## race.ethnicity.5levelOther -0.003209   0.315116  -0.010 0.991875

```

```
## race.ethnicity.5levelWhite      0.099242   0.259284   0.383 0.701935
## interview_age                   0.011062   0.004776   2.316 0.020624 *
## bmi                             0.001353   0.009858   0.137 0.890806
## household.income[>=200K]       -1.037952   0.265073  -3.916 9.25e-05 ***
## household.income[100K-200K]    -0.856957   0.247368  -3.464 0.000540 ***
## household.income[12K-16K]      0.045379   0.318278   0.143 0.886635
## household.income[16K-25K]      0.059945   0.266335   0.225 0.821941
## household.income[25K-35K]     -0.075731   0.266977  -0.284 0.776693
## household.income[35K-50K]     -0.454552   0.252790  -1.798 0.072272 .
## household.income[50K-75K]     -0.597698   0.245365  -2.436 0.014920 *
## household.income[5K-12K]       -0.031072   0.279263  -0.111 0.911414
## household.income[75K-100K]    -0.932095   0.252268  -3.695 0.000225 ***
## high.educBachelor              -0.001929   0.249863  -0.008 0.993840
## high.educHS Diploma/GED       -0.578251   0.247616  -2.335 0.019606 *
## high.educPost Graduate Degree  -0.257339   0.250943  -1.025 0.305230
## high.educSome College          -0.111793   0.237374  -0.471 0.637711
## demo_race_hispanic1           -0.066530   0.110099  -0.604 0.545712
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0378
## lmer.REML = 10320 Scale est. = 1.934      n = 2582
```

## 1.4 Model: CBCL Depressed DSM-5 ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ PDS_score + race.ethnicity.5level +
##      interview_age + bmi + household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.2070529   0.7372460   1.637   0.1017
## PDS_score       0.1130118   0.0584081   1.935   0.0531 .
## race.ethnicity.5levelBlack -0.1890686   0.2748074  -0.688   0.4915
## race.ethnicity.5levelMixed  0.1951616   0.2676648   0.729   0.4660
## race.ethnicity.5levelOther -0.2411360   0.3135123  -0.769   0.4419
## race.ethnicity.5levelWhite  0.2112751   0.2495603   0.847   0.3973
## interview_age   0.0006124   0.0053434   0.115   0.9088
## bmi             0.0034458   0.0105839   0.326   0.7448
## household.income[>=200K]    -0.7191737   0.2887547  -2.491   0.0128 *
## household.income[100K-200K] -0.5574300   0.2688546  -2.073   0.0382 *
## household.income[12K-16K]   0.0074610   0.3445896   0.022   0.9827
## household.income[16K-25K]  -0.4500986   0.2977632  -1.512   0.1308
## household.income[25K-35K]  -0.0392555   0.2813844  -0.140   0.8891
## household.income[35K-50K]  -0.3336823   0.2732968  -1.221   0.2222
## household.income[50K-75K]  -0.4432217   0.2677925  -1.655   0.0980 .
## household.income[5K-12K]    0.1637256   0.3023181   0.542   0.5882
## household.income[75K-100K] -0.4576971   0.2725190  -1.680   0.0932 .
```

```
## high.educBachelor          -0.2115200  0.2487655  -0.850   0.3953
## high.educHS Diploma/GED    -0.1026540  0.2497984  -0.411   0.6811
## high.educPost Graduate Degree -0.0302769  0.2533932  -0.119   0.9049
## high.educSome College      -0.0896484  0.2321673  -0.386   0.6994
## demo_race_hispanic1        -0.0097103  0.1192277  -0.081   0.9351
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0104
## lmer.REML = 9694.8  Scale est. = 2.4385    n = 2393
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ 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)    0.8033870  0.8131741   0.988 0.323263
## PDS_score       0.0908213  0.0813154   1.117 0.264141
## race.ethnicity.5levelBlack -0.1267356  0.3321863  -0.382 0.702849
## race.ethnicity.5levelMixed  0.2784719  0.3250375   0.857 0.391670
## race.ethnicity.5levelOther  0.0003667  0.3703911   0.001 0.999210
## race.ethnicity.5levelWhite  0.1817621  0.3055718   0.595 0.552012
## interview_age   0.0075637  0.0055997   1.351 0.176899
## bmi            0.0015252  0.0115460   0.132 0.894918
## household.income[>=200K] -1.1521616  0.3120584  -3.692 0.000227 ***
## household.income[100K-200K] -1.0612508  0.2908991  -3.648 0.000269 ***
## household.income[12K-16K]   0.0674931  0.3738249   0.181 0.856737
## household.income[16K-25K]  -0.3948729  0.3128216  -1.262 0.206958
## household.income[25K-35K]  -0.3160483  0.3134866  -1.008 0.313467
## household.income[35K-50K]  -0.6684687  0.2969372  -2.251 0.024457 *
## household.income[50K-75K]  -0.7471650  0.2882832  -2.592 0.009603 **
## household.income[5K-12K]   -0.1624691  0.3278675  -0.496 0.620267
## household.income[75K-100K] -0.9749691  0.2965469  -3.288 0.001024 **
## high.educBachelor    0.4172216  0.2937254   1.420 0.155599
## high.educHS Diploma/GED -0.3359809  0.2910287  -1.154 0.248419
## high.educPost Graduate Degree 0.0912923  0.2949600   0.310 0.756961
## high.educSome College  0.3801381  0.2790734   1.362 0.173272
## demo_race_hispanic1   -0.0621657  0.1320675  -0.471 0.637887
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0255
## lmer.REML = 11128  Scale est. = 2.376    n = 2582
```

## 1.5 Model: CBCL internalizing factor ~ Pubertal category

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ 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)      0.515354   2.220846   0.232  0.81652
## pds_p_ss_categoryEarly  0.181819   0.304480   0.597  0.55047
## pds_p_ss_categoryLate  0.690550   0.770801   0.896  0.37040
## pds_p_ss_categoryMid   0.756328   0.295630   2.558  0.01058 *
## race.ethnicity.5levelBlack -0.489177   0.804046  -0.608  0.54298
## race.ethnicity.5levelMixed  1.186664   0.783467   1.515  0.13000
## race.ethnicity.5levelOther -0.048921   0.916861  -0.053  0.95745
## race.ethnicity.5levelWhite  1.170397   0.730940   1.601  0.10946
## interview_age         0.028234   0.015801   1.787  0.07409 .
## bmi                   0.018041   0.032035   0.563  0.57337
## household.income[>=200K] -2.484994   0.845716  -2.938  0.00333 **
## household.income[100K-200K] -1.530520   0.787420  -1.944  0.05205 .
## household.income[12K-16K]  -0.296461   1.008385  -0.294  0.76879
## household.income[16K-25K]  -1.203397   0.870334  -1.383  0.16689
## household.income[25K-35K]  -0.007737   0.823128  -0.009  0.99250
## household.income[35K-50K]  -1.280262   0.799148  -1.602  0.10928
## household.income[50K-75K]  -1.178881   0.783712  -1.504  0.13266
## household.income[5K-12K]    0.022507   0.883395   0.025  0.97968
## household.income[75K-100K] -1.221179   0.797590  -1.531  0.12588
## high.educBachelor         0.660875   0.729065   0.906  0.36478
## high.educHS Diploma/GED   0.577993   0.731066   0.791  0.42925
## high.educPost Graduate Degree 1.021730   0.742951   1.375  0.16919
## high.educSome College     1.003400   0.680385   1.475  0.14041
## demo_race_hispanic1       -0.030365   0.350722  -0.087  0.93101
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0177
## lmer.REML = 14757 Scale est. = 17.826    n = 2393
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ 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)	3.23422	2.13597	1.514	0.130107
## pds_p_ss_categoryEarly	0.33770	0.26926	1.254	0.209885
## pds_p_ss_categoryLate	-0.44364	1.61853	-0.274	0.784031
## pds_p_ss_categoryMid	1.31557	0.51843	2.538	0.011220 *
## race.ethnicity.5levelBlack	-0.49782	0.86991	-0.572	0.567195
## race.ethnicity.5levelMixed	1.21348	0.85226	1.424	0.154613
## race.ethnicity.5levelOther	0.10434	0.97069	0.107	0.914407
## race.ethnicity.5levelWhite	0.97679	0.80167	1.218	0.223166
## interview_age	0.01060	0.01462	0.725	0.468610
## bmi	0.04052	0.03013	1.345	0.178905
## household.income[>=200K]	-3.20444	0.81904	-3.912	9.38e-05 ***
## household.income[100K-200K]	-2.54245	0.76336	-3.331	0.000879 ***
## household.income[12K-16K]	-0.45756	0.98107	-0.466	0.640976
## household.income[16K-25K]	-0.01813	0.82062	-0.022	0.982371
## household.income[25K-35K]	-0.09341	0.82400	-0.113	0.909752
## household.income[35K-50K]	-1.15846	0.77888	-1.487	0.137046
## household.income[50K-75K]	-1.63401	0.75577	-2.162	0.030708 *
## household.income[5K-12K]	-0.11402	0.85923	-0.133	0.894443
## household.income[75K-100K]	-2.72057	0.77773	-3.498	0.000477 ***
## high.educBachelor	1.50797	0.76994	1.959	0.050275 .
## high.educHS Diploma/GED	-0.90169	0.76348	-1.181	0.237700
## high.educPost Graduate Degree	0.75665	0.77310	0.979	0.327813
## high.educSome College	0.96114	0.73205	1.313	0.189319
## demo_race_hispanic1	0.10935	0.34898	0.313	0.754046

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0357
## lmer.REML = 16052 Scale est. = 16.164    n = 2582
```

## 1.6 Model: CBCL Anxious-Depressed ~ Pubertal category

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ 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)	0.712308	1.249598	0.570	0.5687
## pds_p_ss_categoryEarly	0.205193	0.171892	1.194	0.2327
## pds_p_ss_categoryLate	0.262515	0.434926	0.604	0.5462
## pds_p_ss_categoryMid	0.375537	0.166525	2.255	0.0242 *
## race.ethnicity.5levelBlack	-0.154278	0.450501	-0.342	0.7320
## race.ethnicity.5levelMixed	0.789507	0.439111	1.798	0.0723 .
## race.ethnicity.5levelOther	0.159298	0.514129	0.310	0.7567
## race.ethnicity.5levelWhite	0.704038	0.409586	1.719	0.0858 .

```
## interview_age          0.010598    0.008914    1.189    0.2346
## bmi                    -0.012694    0.018014   -0.705    0.4811
## household.income[>=200K] -0.918478    0.473990   -1.938    0.0528 .
## household.income[100K-200K] -0.374602    0.441262   -0.849    0.3960
## household.income[12K-16K]  -0.101662    0.564628   -0.180    0.8571
## household.income[16K-25K]  -0.521964    0.488287   -1.069    0.2852
## household.income[25K-35K]   0.161469    0.461399    0.350    0.7264
## household.income[35K-50K]  -0.344987    0.448011   -0.770    0.4414
## household.income[50K-75K]  -0.230054    0.439195   -0.524    0.6005
## household.income[5K-12K]   0.129438    0.495970    0.261    0.7941
## household.income[75K-100K] -0.209103    0.447042   -0.468    0.6400
## high.educBachelor         0.128066    0.407970    0.314    0.7536
## high.educHS Diploma/GED   -0.040225    0.409457   -0.098    0.9218
## high.educPost Graduate Degree 0.537975    0.415769    1.294    0.1958
## high.educSome College      0.392179    0.380811    1.030    0.3032
## demo_race_hispanic1       0.103386    0.195826    0.528    0.5976
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0136
## lmer.REML = 12042  Scale est. = 6.7337    n = 2393
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ 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)    2.357399   1.200971   1.963  0.04976 *
## pds_p_ss_categoryEarly  0.144144   0.151578   0.951  0.34171
## pds_p_ss_categoryLate -0.074924   0.907919  -0.083  0.93424
## pds_p_ss_categoryMid   0.731739   0.291891   2.507  0.01224 *
## race.ethnicity.5levelBlack -0.096647   0.484563  -0.199  0.84193
## race.ethnicity.5levelMixed  0.663912   0.474508   1.399  0.16189
## race.ethnicity.5levelOther  0.307215   0.542483   0.566  0.57123
## race.ethnicity.5levelWhite  0.664502   0.446195   1.489  0.13654
## interview_age    -0.005646   0.008250  -0.684  0.49381
## bmi              0.007222   0.016967   0.426  0.67041
## household.income[>=200K] -1.296652   0.457700  -2.833  0.00465 **
## household.income[100K-200K] -0.948226   0.426746  -2.222  0.02637 *
## household.income[12K-16K]  -0.131881   0.548745  -0.240  0.81009
## household.income[16K-25K]  -0.021660   0.459182  -0.047  0.96238
## household.income[25K-35K]   0.065697   0.461284   0.142  0.88676
## household.income[35K-50K]  -0.284118   0.435571  -0.652  0.51427
## household.income[50K-75K]  -0.696215   0.422665  -1.647  0.09964 .
## household.income[5K-12K]   0.039472   0.480723   0.082  0.93457
## household.income[75K-100K] -0.972538   0.434663  -2.237  0.02534 *
```

```
## high.educBachelor      1.194912    0.431053    2.772  0.00561 **
## high.educHS Diploma/GED -0.213100    0.427690   -0.498  0.61835
## high.educPost Graduate Degree 0.855498    0.432751    1.977  0.04816 *
## high.educSome College   0.719937    0.410099    1.756  0.07929 .
## demo_race_hispanic1     0.160561    0.195228    0.822  0.41091
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0196
## lmer.REML = 13121 Scale est. = 6.672      n = 2582
```

## 1.7 Model: CBCL Withdrawn-Depressed ~ Pubertal category

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ 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)    0.685287   0.652785    1.050  0.29392
## pds_p_ss_categoryEarly -0.014723   0.089968   -0.164  0.87002
## pds_p_ss_categoryLate  0.348598   0.227289    1.534  0.12523
## pds_p_ss_categoryMid   0.171908   0.086948    1.977  0.04814 *
## race.ethnicity.5levelBlack -0.379039   0.234582   -1.616  0.10627
## race.ethnicity.5levelMixed -0.027092   0.228506   -0.119  0.90563
## race.ethnicity.5levelOther -0.288256   0.267454   -1.078  0.28124
## race.ethnicity.5levelWhite -0.069125   0.213328   -0.324  0.74594
## interview_age      0.004899   0.004668    1.049  0.29413
## bmi                0.009912   0.009392    1.055  0.29134
## household.income[>=200K] -0.796185   0.246163   -3.234  0.00124 **
## household.income[100K-200K] -0.570113   0.229054   -2.489  0.01288 *
## household.income[12K-16K] -0.281132   0.292691   -0.961  0.33690
## household.income[16K-25K] -0.368348   0.253986   -1.450  0.14712
## household.income[25K-35K] -0.033463   0.239558   -0.140  0.88892
## household.income[35K-50K] -0.545609   0.232715   -2.345  0.01913 *
## household.income[50K-75K] -0.483238   0.227967   -2.120  0.03413 *
## household.income[5K-12K] -0.054763   0.258043   -0.212  0.83195
## household.income[75K-100K] -0.494470   0.232114   -2.130  0.03325 *
## high.educBachelor    -0.035306   0.211327   -0.167  0.86733
## high.educHS Diploma/GED  0.205500   0.212471    0.967  0.33355
## high.educPost Graduate Degree -0.012979   0.215409   -0.060  0.95196
## high.educSome College   0.004969   0.197313    0.025  0.97991
## demo_race_hispanic1    -0.018204   0.101669   -0.179  0.85791
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0201
```

```
## lmer.REML = 8979.8  Scale est. = 2.2981    n = 2393
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ 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)    0.407182   0.693136   0.587 0.556955
## pds_p_ss_categoryEarly    0.055312   0.087693   0.631 0.528263
## pds_p_ss_categoryLate   -0.737010   0.526296  -1.400 0.161523
## pds_p_ss_categoryMid     0.404176   0.169036   2.391 0.016871 *
## race.ethnicity.5levelBlack -0.124736   0.281366  -0.443 0.657569
## race.ethnicity.5levelMixed  0.288589   0.275972   1.046 0.295790
## race.ethnicity.5levelOther  0.015394   0.314979   0.049 0.961023
## race.ethnicity.5levelWhite  0.128912   0.259272   0.497 0.619085
## interview_age     0.011901   0.004756   2.502 0.012399 *
## bmi               0.002317   0.009820   0.236 0.813516
## household.income[>=200K] -1.066349   0.265225  -4.021 5.97e-05 ***
## household.income[100K-200K] -0.885045   0.247582  -3.575 0.000357 ***
## household.income[12K-16K]  -0.001812   0.318720  -0.006 0.995464
## household.income[16K-25K]   0.039187   0.266569   0.147 0.883140
## household.income[25K-35K]  -0.092237   0.267760  -0.344 0.730517
## household.income[35K-50K]  -0.478167   0.253002  -1.890 0.058874 .
## household.income[50K-75K]  -0.615194   0.245417  -2.507 0.012247 *
## household.income[5K-12K]   -0.051611   0.279285  -0.185 0.853403
## household.income[75K-100K] -0.960501   0.252389  -3.806 0.000145 ***
## high.educBachelor    -0.015881   0.249829  -0.064 0.949318
## high.educHS Diploma/GED -0.606079   0.247775  -2.446 0.014508 *
## high.educPost Graduate Degree -0.269326   0.250891  -1.073 0.283159
## high.educSome College  -0.134534   0.237488  -0.566 0.571111
## demo_race_hispanic1    -0.075538   0.110057  -0.686 0.492552
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0394
## lmer.REML = 10316  Scale est. = 1.9432    n = 2582
```

## 1.8 Model: CBCL Depressed DSM-5 ~ Pubertal category

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ 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)      1.254271   0.761815   1.646  0.0998 .
## pds_p_ss_categoryEarly -0.031469   0.104843  -0.300  0.7641
## pds_p_ss_categoryLate  0.127442   0.265291   0.480  0.6310
## pds_p_ss_categoryMid   0.127942   0.101585   1.259  0.2080
## race.ethnicity.5levelBlack -0.175222   0.274631  -0.638  0.5235
## race.ethnicity.5levelMixed  0.198858   0.267809   0.743  0.4578
## race.ethnicity.5levelOther -0.235300   0.313628  -0.750  0.4532
## race.ethnicity.5levelWhite  0.213269   0.249686   0.854  0.3931
## interview_age        0.001470   0.005435   0.271  0.7868
## bmi                  0.003036   0.010991   0.276  0.7824
## household.income[>=200K] -0.713207   0.289257  -2.466  0.0137 *
## household.income[100K-200K] -0.551048   0.269311  -2.046  0.0409 *
## household.income[12K-16K] -0.005753   0.344647  -0.017  0.9867
## household.income[16K-25K] -0.453692   0.298004  -1.522  0.1280
## household.income[25K-35K] -0.047835   0.281624  -0.170  0.8651
## household.income[35K-50K] -0.341577   0.273423  -1.249  0.2117
## household.income[50K-75K] -0.440780   0.268058  -1.644  0.1002
## household.income[5K-12K]   0.164917   0.302684   0.545  0.5859
## household.income[75K-100K] -0.457504   0.272841  -1.677  0.0937 .
## high.educBachelor      -0.224131   0.249030  -0.900  0.3682
## high.educHS Diploma/GED -0.104752   0.249911  -0.419  0.6751
## high.educPost Graduate Degree -0.042354   0.253781  -0.167  0.8675
## high.educSome College   -0.090303   0.232462  -0.388  0.6977
## demo_race_hispanic1     -0.016516   0.119227  -0.139  0.8898
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00935
## lmer.REML = 9698.5  Scale est. = 2.4591    n = 2393
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ 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)      0.871849   0.814931   1.070  0.284791
## pds_p_ss_categoryEarly  0.132906   0.102833   1.292  0.196319
## pds_p_ss_categoryLate -0.053353   0.618118  -0.086  0.931223
## pds_p_ss_categoryMid   0.224861   0.198051   1.135  0.256326
## race.ethnicity.5levelBlack -0.122261   0.331888  -0.368  0.712621
## race.ethnicity.5levelMixed  0.289637   0.325272   0.890  0.373311
## race.ethnicity.5levelOther  0.009502   0.370571   0.026  0.979545
```

```
## race.ethnicity.5levelWhite      0.200115   0.305865   0.654 0.513004
## interview_age                   0.007626   0.005580   1.367 0.171857
## bmi                             0.001369   0.011510   0.119 0.905337
## household.income[>=200K]       -1.154950   0.312539  -3.695 0.000224 ***
## household.income[100K-200K]    -1.062598   0.291411  -3.646 0.000271 ***
## household.income[12K-16K]      0.056001   0.374670   0.149 0.881197
## household.income[16K-25K]     -0.400816   0.313370  -1.279 0.200995
## household.income[25K-35K]     -0.320948   0.314680  -1.020 0.307863
## household.income[35K-50K]     -0.671560   0.297447  -2.258 0.024045 *
## household.income[50K-75K]     -0.747285   0.288599  -2.589 0.009670 **
## household.income[5K-12K]      -0.169623   0.328180  -0.517 0.605300
## household.income[75K-100K]    -0.979784   0.296948  -3.300 0.000982 ***
## high.educBachelor              0.413478   0.293922   1.407 0.159619
## high.educHS Diploma/GED       -0.343192   0.291450  -1.178 0.239093
## high.educPost Graduate Degree  0.087732   0.295142   0.297 0.766298
## high.educSome College          0.370855   0.279424   1.327 0.184557
## demo_race_hispanic1           -0.067165   0.132218  -0.508 0.611505
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0252
## lmer.REML = 11127  Scale est. = 2.3763    n = 2582
```

## 1.9 Model: CBCL internalizing factor ~ Testosterone

### Females

```
##
## 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)                  -2.202149   2.280520  -0.966 0.334335
## hormone_scr_ert_mean           0.001591   0.007417   0.215 0.830155
## hormone_sal_end_min_since_midnight 0.000333   0.000704   0.473 0.636225
## race.ethnicity.5levelBlack    -0.564439   0.816203  -0.692 0.489299
## race.ethnicity.5levelMixed     1.216996   0.796092   1.529 0.126481
## race.ethnicity.5levelOther    -0.257284   0.939620  -0.274 0.784251
## race.ethnicity.5levelWhite     1.214960   0.740255   1.641 0.100886
## interview_age                  0.044621   0.015797   2.825 0.004778 **
## bmi                           0.061797   0.032227   1.918 0.055302 .
## household.income[>=200K]      -2.985044   0.872121  -3.423 0.000631 ***
## household.income[100K-200K]   -2.097440   0.809473  -2.591 0.009630 **
## household.income[12K-16K]     -0.727069   1.048155  -0.694 0.487966
## household.income[16K-25K]     -1.411506   0.901101  -1.566 0.117395
## household.income[25K-35K]     -0.571138   0.846422  -0.675 0.499895
## household.income[35K-50K]     -1.576855   0.823333  -1.915 0.055597 .
## household.income[50K-75K]     -1.595383   0.809216  -1.972 0.048792 *
```

```
## household.income[5K-12K]          -0.556654    0.927818   -0.600  0.548595
## household.income[75K-100K]        -1.766294    0.820500   -2.153  0.031452 *
## high.educBachelor                  1.083622    0.760606    1.425  0.154393
## high.educHS Diploma/GED           1.135117    0.762582    1.489  0.136759
## high.educPost Graduate Degree      1.521768    0.774672    1.964  0.049611 *
## high.educSome College              1.495050    0.709347    2.108  0.035176 *
## demo_race_hispanic1               -0.097395    0.364022   -0.268  0.789069
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0182
## lmer.REML = 13547  Scale est. = 17.516    n = 2194
```

## Males

```
##
## 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)    3.3805002   2.2422418   1.508  0.131779
## hormone_scr_ert_mean    0.0048902   0.0078223   0.625  0.531920
## hormone_sal_end_min_since_midnight  0.0010682   0.0006797   1.571  0.116201
## race.ethnicity.5levelBlack   -0.3905890   0.8915577  -0.438  0.661356
## race.ethnicity.5levelMixed    1.0664243   0.8715831   1.224  0.221244
## race.ethnicity.5levelOther    0.1315377   0.9908942   0.133  0.894405
## race.ethnicity.5levelWhite    0.9982003   0.8192768   1.218  0.223196
## interview_age      0.0077550   0.0149298   0.519  0.603509
## bmi                0.0294019   0.0310430   0.947  0.343667
## household.income[>=200K]    -3.2993791   0.8497547  -3.883  0.000106 ***
## household.income[100K-200K] -2.7505412   0.7949687  -3.460  0.000550 ***
## household.income[12K-16K]   -0.2712899   1.0305554  -0.263  0.792384
## household.income[16K-25K]   -0.2957324   0.8540034  -0.346  0.729156
## household.income[25K-35K]   -0.9298497   0.8532212  -1.090  0.275907
## household.income[35K-50K]   -1.4396566   0.8107853  -1.776  0.075922 .
## household.income[50K-75K]   -1.9121216   0.7874051  -2.428  0.015240 *
## household.income[5K-12K]    -0.2386447   0.8838600  -0.270  0.787182
## household.income[75K-100K]  -2.8686350   0.8101562  -3.541  0.000407 ***
## high.educBachelor          1.2412073   0.7964565   1.558  0.119269
## high.educHS Diploma/GED    -0.7449949   0.7903784  -0.943  0.345992
## high.educPost Graduate Degree  0.4536646   0.8010613   0.566  0.571223
## high.educSome College       0.8549347   0.7581064   1.128  0.259551
## demo_race_hispanic1        -0.0429705   0.3570446  -0.120  0.904216
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) = 0.0314
## lmer.REML = 14838 Scale est. = 14.802 n = 2392
```

## 1.10 Model: CBCL Anxious-Depressed ~ Testosterone

### Females

```
##
## 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_hispanic1
##
## Parametric coefficients:
##
```

	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	-0.6772703	1.2914696	-0.524	0.6000
## hormone_scr_ert_mean	0.0004716	0.0042039	0.112	0.9107
## hormone_sal_end_min_since_midnight	0.0003276	0.0003970	0.825	0.4093
## race.ethnicity.5levelBlack	-0.1368519	0.4594753	-0.298	0.7659
## race.ethnicity.5levelMixed	0.8384900	0.4484098	1.870	0.0616 .
## race.ethnicity.5levelOther	0.1023564	0.5295352	0.193	0.8467
## race.ethnicity.5levelWhite	0.7245162	0.4167716	1.738	0.0823 .
## interview_age	0.0192288	0.0089747	2.143	0.0323 *
## bmi	0.0059966	0.0182163	0.329	0.7420
## household.income[>=200K]	-1.0963527	0.4912061	-2.232	0.0257 *
## household.income[100K-200K]	-0.5902143	0.4558312	-1.295	0.1955
## household.income[12K-16K]	-0.1953279	0.5895983	-0.331	0.7405
## household.income[16K-25K]	-0.6022378	0.5082887	-1.185	0.2362
## household.income[25K-35K]	-0.0412148	0.4767757	-0.086	0.9311
## household.income[35K-50K]	-0.4586758	0.4638686	-0.989	0.3229
## household.income[50K-75K]	-0.3492380	0.4556672	-0.766	0.4435
## household.income[5K-12K]	-0.1950754	0.5241195	-0.372	0.7098
## household.income[75K-100K]	-0.4164295	0.4621374	-0.901	0.3676
## high.educBachelor	0.1977527	0.4281320	0.462	0.6442
## high.educHS Diploma/GED	0.1323975	0.4297721	0.308	0.7581
## high.educPost Graduate Degree	0.6574649	0.4361054	1.508	0.1318
## high.educSome College	0.4952835	0.3994622	1.240	0.2152
## demo_race_hispanic1	0.0680369	0.2042909	0.333	0.7391

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0129
## lmer.REML = 11083 Scale est. = 6.8399 n = 2194
```

### Males

```
##
## 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)      2.7051814   1.2631914    2.142  0.03233 *
## hormone_scr_ert_mean      0.0035098   0.0044094    0.796  0.42612
## hormone_sal_end_min_since_midnight  0.0002172   0.0003830    0.567  0.57072
## race.ethnicity.5levelBlack      -0.1091037   0.4986411   -0.219  0.82682
## race.ethnicity.5levelMixed      0.5093862   0.4873293    1.045  0.29601
## race.ethnicity.5levelOther      0.2905096   0.5558033    0.523  0.60124
## race.ethnicity.5levelWhite      0.6490454   0.4579377    1.417  0.15652
## interview_age      -0.0075488   0.0084397   -0.894  0.37118
## bmi      0.0014931   0.0175061    0.085  0.93204
## household.income[>=200K]      -1.3496427   0.4764029   -2.833  0.00465 **
## household.income[100K-200K]      -1.0648583   0.4458635   -2.388  0.01700 *
## household.income[12K-16K]      0.0294426   0.5776482    0.051  0.95935
## household.income[16K-25K]      -0.2426899   0.4792974   -0.506  0.61266
## household.income[25K-35K]      -0.3537938   0.4787290   -0.739  0.45996
## household.income[35K-50K]      -0.4504315   0.4546905   -0.991  0.32197
## household.income[50K-75K]      -0.8535088   0.4416677   -1.932  0.05342 .
## household.income[5K-12K]      0.0016688   0.4956448    0.003  0.99731
## household.income[75K-100K]      -1.0511528   0.4542723   -2.314  0.02076 *
## high.educBachelor      1.0842458   0.4467321    2.427  0.01530 *
## high.educHS Diploma/GED      -0.0843212   0.4434692   -0.190  0.84922
## high.educPost Graduate Degree      0.7382547   0.4492819    1.643  0.10048
## high.educSome College      0.6915840   0.4253707    1.626  0.10412
## demo_race_hispanic1      0.0969560   0.2003195    0.484  0.62843
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0149
## lmer.REML = 12127  Scale est. = 5.9662    n = 2392

```

## 1.11 Model: CBCL Withdrawn-Depressed ~ Testosterone

### Females

```

##
## 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)      2.037e-01   6.726e-01    0.303  0.76200
## hormone_scr_ert_mean      4.124e-03   2.189e-03    1.884  0.05974 .
## hormone_sal_end_min_since_midnight -7.106e-05   2.069e-04   -0.343  0.73136
## race.ethnicity.5levelBlack      -4.212e-01   2.384e-01   -1.766  0.07745 .

```

```

## race.ethnicity.5levelMixed      -8.803e-04  2.326e-01  -0.004  0.99698
## race.ethnicity.5levelOther      -3.356e-01  2.745e-01  -1.222  0.22169
## race.ethnicity.5levelWhite      -2.897e-02  2.163e-01  -0.134  0.89345
## interview_age                   6.707e-03  4.685e-03   1.432  0.15241
## bmi                             1.811e-02  9.463e-03   1.914  0.05579 .
## household.income[>=200K]        -9.507e-01  2.543e-01  -3.738  0.00019 ***
## household.income[100K-200K]     -7.053e-01  2.359e-01  -2.990  0.00282 **
## household.income[12K-16K]       -4.337e-01  3.047e-01  -1.423  0.15477
## household.income[16K-25K]       -3.490e-01  2.637e-01  -1.324  0.18571
## household.income[25K-35K]       -1.819e-01  2.468e-01  -0.737  0.46114
## household.income[35K-50K]       -6.173e-01  2.402e-01  -2.570  0.01024 *
## household.income[50K-75K]       -5.894e-01  2.358e-01  -2.500  0.01251 *
## household.income[5K-12K]        -1.436e-01  2.721e-01  -0.528  0.59789
## household.income[75K-100K]      -6.301e-01  2.392e-01  -2.634  0.00850 **
## high.educBachelor               1.357e-01  2.215e-01   0.613  0.54025
## high.educHS Diploma/GED         4.185e-01  2.228e-01   1.878  0.06050 .
## high.educPost Graduate Degree    1.955e-01  2.257e-01   0.866  0.38656
## high.educSome College            2.308e-01  2.068e-01   1.116  0.26454
## demo_race_hispanic1             -1.692e-02  1.058e-01  -0.160  0.87297
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0203
## lmer.REML = 8259.1  Scale est. = 2.2518    n = 2194

```

## Males

```

##
## 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)    0.1299469   0.7318285   0.178 0.859080
## hormone_scr_ert_mean  0.0034224   0.0025461   1.344 0.179022
## hormone_sal_end_min_since_midnight 0.0004998   0.0002140   2.336 0.019585 *
## race.ethnicity.5levelBlack -0.1106784   0.2897457  -0.382 0.702507
## race.ethnicity.5levelMixed  0.2910055   0.2836290   1.026 0.304993
## race.ethnicity.5levelOther  0.0538053   0.3235524   0.166 0.867939
## race.ethnicity.5levelWhite  0.1483680   0.2660515   0.558 0.577125
## interview_age      0.0117943   0.0048977   2.408 0.016110 *
## bmi               -0.0015056   0.0101905  -0.148 0.882556
## household.income[>=200K] -1.1103698   0.2766330  -4.014 6.16e-05 ***
## household.income[100K-200K] -0.9580569   0.2593356  -3.694 0.000226 ***
## household.income[12K-16K] -0.0037480   0.3368989  -0.011 0.991125
## household.income[16K-25K] -0.0025972   0.2792502  -0.009 0.992580
## household.income[25K-35K] -0.3072663   0.2789262  -1.102 0.270746
## household.income[35K-50K] -0.5514530   0.2650600  -2.080 0.037588 *

```

```
## household.income[50K-75K]          -0.7152422  0.2572210  -2.781  0.005468 **
## household.income[5K-12K]           -0.0757049  0.2891869  -0.262  0.793510
## household.income[75K-100K]         -1.0095935  0.2644996  -3.817  0.000139 ***
## high.educBachelor                  -0.0563274  0.2596880  -0.217  0.828302
## high.educHS Diploma/GED            -0.5501548  0.2577726  -2.134  0.032924 *
## high.educPost Graduate Degree       -0.3278045  0.2613063  -1.254  0.209790
## high.educSome College               -0.1289879  0.2470983  -0.522  0.601712
## demo_race_hispanic1                -0.1483359  0.1121480  -1.323  0.186070
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0396
## lmer.REML =  9561  Scale est. = 1.9242    n = 2392
```

## 1.12 Model: CBCL Depressed DSM-5 ~ Testosterone

### Females

```
##
## 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)    0.5448231  0.7855508   0.694  0.48804
## hormone_scr_ert_mean    0.0002492  0.0025575   0.097  0.92238
## hormone_sal_end_min_since_midnight  0.0001340  0.0002405   0.557  0.57748
## race.ethnicity.5levelBlack -0.1485679  0.2793271  -0.532  0.59487
## race.ethnicity.5levelMixed  0.2228049  0.2728009   0.817  0.41417
## race.ethnicity.5levelOther -0.2463580  0.3222510  -0.764  0.44466
## race.ethnicity.5levelWhite  0.2689667  0.2533752   1.062  0.28856
## interview_age    0.0050960  0.0054599   0.933  0.35074
## bmi              0.0136328  0.0110909   1.229  0.21914
## household.income[>=200K]    -0.8399652  0.2990620  -2.809  0.00502 **
## household.income[100K-200K] -0.6906508  0.2775604  -2.488  0.01291 *
## household.income[12K-16K]   -0.1248396  0.3590775  -0.348  0.72812
## household.income[16K-25K]   -0.4488379  0.3095188  -1.450  0.14717
## household.income[25K-35K]   -0.1706572  0.2903564  -0.588  0.55676
## household.income[35K-50K]   -0.4208837  0.2824487  -1.490  0.13634
## household.income[50K-75K]   -0.5418391  0.2774752  -1.953  0.05098 .
## household.income[5K-12K]    -0.0400520  0.3191595  -0.125  0.90015
## household.income[75K-100K]  -0.5672067  0.2814055  -2.016  0.04396 *
## high.educBachelor          -0.1290761  0.2607057  -0.495  0.62058
## high.educHS Diploma/GED    -0.0003630  0.2616818  -0.001  0.99889
## high.educPost Graduate Degree  0.0669397  0.2655463   0.252  0.80100
## high.educSome College       0.0006746  0.2432671   0.003  0.99779
## demo_race_hispanic1        -0.0492478  0.1239892  -0.397  0.69126
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.0086
## lmer.REML = 8927 Scale est. = 2.504 n = 2194

Males

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

	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	1.1089210	0.8528185	1.300	0.193624
## hormone_scr_ert_mean	0.0025473	0.0029744	0.856	0.391856
## hormone_sal_end_min_since_midnight	0.0004028	0.0002568	1.568	0.116947
## race.ethnicity.5levelBlack	-0.1048659	0.3389517	-0.309	0.757057
## race.ethnicity.5levelMixed	0.2323189	0.3314597	0.701	0.483437
## race.ethnicity.5levelOther	0.0553055	0.3770389	0.147	0.883394
## race.ethnicity.5levelWhite	0.1963183	0.3114462	0.630	0.528530
## interview_age	0.0054812	0.0056847	0.964	0.335038
## bmi	-0.0041071	0.0118219	-0.347	0.728313
## household.income[>=200K]	-1.2041317	0.3231176	-3.727	0.000199 ***
## household.income[100K-200K]	-1.1848778	0.3024065	-3.918	9.18e-05 ***
## household.income[12K-16K]	0.0684012	0.3921856	0.174	0.861558
## household.income[16K-25K]	-0.4522390	0.3249924	-1.392	0.164193
## household.income[25K-35K]	-0.6489931	0.3246895	-1.999	0.045743 *
## household.income[35K-50K]	-0.8104691	0.3085476	-2.627	0.008677 **
## household.income[50K-75K]	-0.8808591	0.2996055	-2.940	0.003313 **
## household.income[5K-12K]	-0.2348057	0.3364084	-0.698	0.485259
## household.income[75K-100K]	-1.0337418	0.3082316	-3.354	0.000810 ***
## high.educBachelor	0.2793866	0.3029385	0.922	0.356489
## high.educHS Diploma/GED	-0.3735840	0.3006348	-1.243	0.214120
## high.educPost Graduate Degree	-0.0428537	0.3047169	-0.141	0.888171
## high.educSome College	0.2771872	0.2883268	0.961	0.336467
## demo_race_hispanic1	-0.1314448	0.1348643	-0.975	0.329836

```
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0257
## lmer.REML = 10263 Scale est. = 2.2078 n = 2392
```

### 1.13 Model: CBCL internalizing factor ~ Testosterone + PDS

#### Females

```
##
## 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)	-1.0235183	2.2937529	-0.446	0.655483
## hormone_scr_ert_mean	-0.0039075	0.0075274	-0.519	0.603738
## hormone_sal_end_min_since_midnight	0.0003904	0.0007025	0.556	0.578475
## PDS_score	0.6968211	0.1813164	3.843	0.000125 ***
## race.ethnicity.5levelBlack	-0.8738375	0.8173791	-1.069	0.285156
## race.ethnicity.5levelMixed	1.0856218	0.7939893	1.367	0.171673
## race.ethnicity.5levelOther	-0.3238110	0.9364448	-0.346	0.729536
## race.ethnicity.5levelWhite	1.1398878	0.7379822	1.545	0.122589
## interview_age	0.0293430	0.0162433	1.806	0.070984 .
## bmi	0.0418235	0.0325327	1.286	0.198726
## household.income[>=200K]	-2.7947142	0.8702052	-3.212	0.001339 **
## household.income[100K-200K]	-1.9360962	0.8074842	-2.398	0.016583 *
## household.income[12K-16K]	-0.5222649	1.0454545	-0.500	0.617437
## household.income[16K-25K]	-1.3051584	0.8981967	-1.453	0.146344
## household.income[25K-35K]	-0.4354260	0.8439344	-0.516	0.605943
## household.income[35K-50K]	-1.4569271	0.8208460	-1.775	0.076053 .
## household.income[50K-75K]	-1.4951269	0.8065764	-1.854	0.063922 .
## household.income[5K-12K]	-0.4912888	0.9246786	-0.531	0.595260
## household.income[75K-100K]	-1.5973797	0.8185850	-1.951	0.051139 .
## high.educBachelor	1.0797204	0.7577160	1.425	0.154310
## high.educHS Diploma/GED	1.0730662	0.7599078	1.412	0.158064
## high.educPost Graduate Degree	1.5024283	0.7717551	1.947	0.051691 .
## high.educSome College	1.3854747	0.7072093	1.959	0.050232 .
## demo_race_hispanic1	-0.0519846	0.3630728	-0.143	0.886162

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0237
## lmer.REML = 13534 Scale est. = 17.697    n = 2194
```

## Males

```
##
## 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)	3.3555049	2.2393249	1.498	0.134151
## hormone_scr_ert_mean	0.0030847	0.0078412	0.393	0.694061

```

## hormone_sal_end_min_since_midnight 0.0010918 0.0006787 1.609 0.107844
## PDS_score 0.5964451 0.2235365 2.668 0.007677 **
## race.ethnicity.5levelBlack -0.5787815 0.8933340 -0.648 0.517119
## race.ethnicity.5levelMixed 1.0652490 0.8705881 1.224 0.221226
## race.ethnicity.5levelOther 0.1536256 0.9897469 0.155 0.876663
## race.ethnicity.5levelWhite 1.0080296 0.8183389 1.232 0.218146
## interview_age 0.0028944 0.0150225 0.193 0.847232
## bmi 0.0178667 0.0313010 0.571 0.568188
## household.income[>=200K] -3.1021961 0.8520024 -3.641 0.000277 ***
## household.income[100K-200K] -2.5588013 0.7973164 -3.209 0.001349 **
## household.income[12K-16K] -0.1776146 1.0299995 -0.172 0.863105
## household.income[16K-25K] -0.1222170 0.8555048 -0.143 0.886413
## household.income[25K-35K] -0.7270881 0.8556224 -0.850 0.395535
## household.income[35K-50K] -1.2542279 0.8128651 -1.543 0.122971
## household.income[50K-75K] -1.7630756 0.7884980 -2.236 0.025445 *
## household.income[5K-12K] -0.2034881 0.8829576 -0.230 0.817753
## household.income[75K-100K] -2.6779137 0.8123872 -3.296 0.000994 ***
## high.educBachelor 1.1500976 0.7962569 1.444 0.148764
## high.educHS Diploma/GED -0.8435550 0.7903163 -1.067 0.285916
## high.educPost Graduate Degree 0.3672177 0.8007837 0.459 0.646583
## high.educSome College 0.7355487 0.7585390 0.970 0.332299
## demo_race_hispanic1 -0.0565550 0.3565637 -0.159 0.873989
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0331
## lmer.REML = 14832 Scale est. = 14.69 n = 2392

```

## 1.14 Model: CBCL internalizing factor ~ Testosterone + Pubertal category

### Females

```

##
## 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)   -0.4791156   2.3737499  -0.202  0.84006
## hormone_scr_ert_mean -0.0018296   0.0075063  -0.244  0.80745
## hormone_sal_end_min_since_midnight 0.0003195   0.0007049   0.453  0.65037
## pds_p_ss_categoryEarly 0.3199518   0.3157908   1.013  0.31109
## pds_p_ss_categoryLate 0.7413169   0.8198696   0.904  0.36600
## pds_p_ss_categoryMid 0.8521830   0.3109844   2.740  0.00619 **
## race.ethnicity.5levelBlack -0.7575458   0.8179247  -0.926  0.35446
## race.ethnicity.5levelMixed 1.1289051   0.7953866   1.419  0.15595
## race.ethnicity.5levelOther -0.2785297   0.9380016  -0.297  0.76654
## race.ethnicity.5levelWhite 1.1648902   0.7392110   1.576  0.11520
## interview_age 0.0314119   0.0166281   1.889  0.05901 .

```

```
## bmi 0.0361033 0.0337279 1.070 0.28455
## household.income[>=200K] -2.8229835 0.8727427 -3.235 0.00124 **
## household.income[100K-200K] -1.9541412 0.8100575 -2.412 0.01593 *
## household.income[12K-16K] -0.6780736 1.0467838 -0.648 0.51720
## household.income[16K-25K] -1.3046423 0.9003999 -1.449 0.14749
## household.income[25K-35K] -0.5202213 0.8459213 -0.615 0.53864
## household.income[35K-50K] -1.5206784 0.8221872 -1.850 0.06451 .
## household.income[50K-75K] -1.5254036 0.8084430 -1.887 0.05932 .
## household.income[5K-12K] -0.5169751 0.9266703 -0.558 0.57698
## household.income[75K-100K] -1.6452994 0.8204060 -2.005 0.04504 *
## high.educBachelor 1.0535667 0.7602749 1.386 0.16596
## high.educHS Diploma/GED 1.0940361 0.7613975 1.437 0.15090
## high.educPost Graduate Degree 1.4814336 0.7745445 1.913 0.05592 .
## high.educSome College 1.4376086 0.7093335 2.027 0.04281 *
## demo_race_hispanic1 -0.1029159 0.3635832 -0.283 0.77716
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0204
## lmer.REML = 13540 Scale est. = 17.955 n = 2194
```

## Males

```
##
## 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) 3.5811749 2.2456007 1.595 0.110901
## hormone_scr_ert_mean 0.0039347 0.0078309 0.502 0.615396
## hormone_sal_end_min_since_midnight 0.0010882 0.0006794 1.602 0.109323
## pds_p_ss_categoryEarly 0.4034434 0.2793663 1.444 0.148833
## pds_p_ss_categoryLate 1.4982688 1.9532895 0.767 0.443129
## pds_p_ss_categoryMid 1.1662689 0.5312009 2.196 0.028222 *
## race.ethnicity.5levelBlack -0.5281809 0.8931675 -0.591 0.554338
## race.ethnicity.5levelMixed 1.1256653 0.8716952 1.291 0.196708
## race.ethnicity.5levelOther 0.1801788 0.9908638 0.182 0.855724
## race.ethnicity.5levelWhite 1.0874633 0.8197727 1.327 0.184788
## interview_age 0.0046756 0.0149915 0.312 0.755157
## bmi 0.0214360 0.0312173 0.687 0.492357
## household.income[>=200K] -3.1076288 0.8538593 -3.640 0.000279 ***
## household.income[100K-200K] -2.5610841 0.7992413 -3.204 0.001371 **
## household.income[12K-16K] -0.1799988 1.0327250 -0.174 0.861649
## household.income[16K-25K] -0.1284680 0.8575024 -0.150 0.880922
## household.income[25K-35K] -0.7083791 0.8601272 -0.824 0.410264
## household.income[35K-50K] -1.2590822 0.8151572 -1.545 0.122580
## household.income[50K-75K] -1.7624825 0.7899045 -2.231 0.025757 *
```

```
## household.income[5K-12K] -0.1929420 0.8848564 -0.218 0.827410
## household.income[75K-100K] -2.6915897 0.8139773 -3.307 0.000958 ***
## high.educBachelor 1.2022349 0.7968383 1.509 0.131495
## high.educHS Diploma/GED -0.8214976 0.7916041 -1.038 0.299486
## high.educPost Graduate Degree 0.4184123 0.8013957 0.522 0.601646
## high.educSome College 0.7681790 0.7594912 1.011 0.311910
## demo_race_hispanic1 -0.0732975 0.3571391 -0.205 0.837406
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0323
## lmer.REML = 14829 Scale est. = 14.704 n = 2392
```

## 1.15 Model: CBCL Anxious-Depressed ~ Testosterone + PDS

### Females

```
##
## 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) -0.1474743 1.3006223 -0.113 0.90973
## hormone_scr_ert_mean -0.0020267 0.0042730 -0.474 0.63532
## hormone_sal_end_min_since_midnight 0.0003520 0.0003967 0.887 0.37504
## PDS_score 0.3139131 0.1027613 3.055 0.00228 **
## race.ethnicity.5levelBlack -0.2742696 0.4607915 -0.595 0.55176
## race.ethnicity.5levelMixed 0.7800913 0.4478394 1.742 0.08167 .
## race.ethnicity.5levelOther 0.0738792 0.5284416 0.140 0.88883
## race.ethnicity.5levelWhite 0.6910203 0.4160889 1.661 0.09691 .
## interview_age 0.0123825 0.0092363 1.341 0.18018
## bmi -0.0031050 0.0184162 -0.169 0.86613
## household.income[>=200K] -1.0108430 0.4907583 -2.060 0.03954 *
## household.income[100K-200K] -0.5181084 0.4552856 -1.138 0.25525
## household.income[12K-16K] -0.1029896 0.5888390 -0.175 0.86117
## household.income[16K-25K] -0.5560220 0.5073000 -1.096 0.27318
## household.income[25K-35K] 0.0186861 0.4759666 0.039 0.96869
## household.income[35K-50K] -0.4055175 0.4630561 -0.876 0.38127
## household.income[50K-75K] -0.3051537 0.4547577 -0.671 0.50228
## household.income[5K-12K] -0.1680152 0.5229856 -0.321 0.74804
## household.income[75K-100K] -0.3409762 0.4616468 -0.739 0.46022
## high.educBachelor 0.1972908 0.4270731 0.462 0.64416
## high.educHS Diploma/GED 0.1063651 0.4288322 0.248 0.80413
## high.educPost Graduate Degree 0.6494771 0.4350427 1.493 0.13561
## high.educSome College 0.4468687 0.3987839 1.121 0.26259
## demo_race_hispanic1 0.0883378 0.2040670 0.433 0.66514
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.0158
## lmer.REML = 11077 Scale est. = 6.9027 n = 2194

Males

##
## 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)	2.6893771	1.2618611	2.131	0.03317 *
## hormone_scr_ert_mean	0.0025645	0.0044209	0.580	0.56191
## hormone_sal_end_min_since_midnight	0.0002306	0.0003826	0.603	0.54685
## PDS_score	0.3145322	0.1261218	2.494	0.01270 *
## race.ethnicity.5levelBlack	-0.2060364	0.4997066	-0.412	0.68015
## race.ethnicity.5levelMixed	0.5111685	0.4869047	1.050	0.29390
## race.ethnicity.5levelOther	0.3041434	0.5553086	0.548	0.58395
## race.ethnicity.5levelWhite	0.6562924	0.4575521	1.434	0.15160
## interview_age	-0.0101159	0.0084939	-1.191	0.23379
## bmi	-0.0046039	0.0176575	-0.261	0.79432
## household.income[>=200K]	-1.2448737	0.4777880	-2.605	0.00923 **
## household.income[100K-200K]	-0.9628445	0.4473009	-2.153	0.03145 *
## household.income[12K-16K]	0.0800668	0.5774493	0.139	0.88973
## household.income[16K-25K]	-0.1514097	0.4802239	-0.315	0.75257
## household.income[25K-35K]	-0.2464034	0.4801862	-0.513	0.60790
## household.income[35K-50K]	-0.3532115	0.4559252	-0.775	0.43859
## household.income[50K-75K]	-0.7744322	0.4423742	-1.751	0.08014 .
## household.income[5K-12K]	0.0207600	0.4952209	0.042	0.96657
## household.income[75K-100K]	-0.9504640	0.4556162	-2.086	0.03708 *
## high.educBachelor	1.0359970	0.4467055	2.319	0.02047 *
## high.educHS Diploma/GED	-0.1363819	0.4435177	-0.308	0.75849
## high.educPost Graduate Degree	0.6923039	0.4492151	1.541	0.12342
## high.educSome College	0.6283093	0.4257019	1.476	0.14009
## demo_race_hispanic1	0.0902449	0.2001212	0.451	0.65207

```
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0164
## lmer.REML = 12123 Scale est. = 5.9262 n = 2392
```

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

### Females

```
##
## 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)      0.1130945   1.3447302   0.084   0.9330
## hormone_scr_ert_mean -0.0010164   0.0042580  -0.239   0.8114
## hormone_sal_end_min_since_midnight 0.0003058   0.0003977   0.769   0.4420
## pds_p_ss_categoryEarly 0.2452367   0.1794051   1.367   0.1718
## pds_p_ss_categoryLate 0.2714538   0.4653101   0.583   0.5597
## pds_p_ss_categoryMid 0.4063780   0.1763814   2.304   0.0213 *
## race.ethnicity.5levelBlack -0.2162464   0.4608365  -0.469   0.6389
## race.ethnicity.5levelMixed 0.7990085   0.4483636   1.782   0.0749 .
## race.ethnicity.5levelOther 0.0908101   0.5290057   0.172   0.8637
## race.ethnicity.5levelWhite 0.7024600   0.4165245   1.686   0.0918 .
## interview_age      0.0130394   0.0094450   1.381   0.1676
## bmi               -0.0060622   0.0190825  -0.318   0.7508
## household.income[>=200K] -1.0276877   0.4918901  -2.089   0.0368 *
## household.income[100K-200K] -0.5302331   0.4564655  -1.162   0.2455
## household.income[12K-16K] -0.1829693   0.5892303  -0.311   0.7562
## household.income[16K-25K] -0.5483277   0.5082410  -1.079   0.2808
## household.income[25K-35K] -0.0221415   0.4768142  -0.046   0.9630
## household.income[35K-50K] -0.4321851   0.4635323  -0.932   0.3512
## household.income[50K-75K] -0.3207558   0.4555353  -0.704   0.4814
## household.income[5K-12K] -0.1752306   0.5237732  -0.335   0.7380
## household.income[75K-100K] -0.3633979   0.4623972  -0.786   0.4320
## high.educBachelor      0.1876197   0.4283013   0.438   0.6614
## high.educHS Diploma/GED 0.1186534   0.4294391   0.276   0.7823
## high.educPost Graduate Degree 0.6420506   0.4364024   1.471   0.1414
## high.educSome College 0.4743118   0.3997786   1.186   0.2356
## demo_race_hispanic1    0.0647933   0.2042215   0.317   0.7511
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0137
## lmer.REML = 11081 Scale est. = 6.96      n = 2194

```

## Males

```

##
## 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)      2.7981649   1.2651209   2.212  0.02708 *
## hormone_scr_ert_mean      0.0030285   0.0044150   0.686  0.49280
## hormone_sal_end_min_since_midnight 0.0002296   0.0003830   0.599  0.54893
## pds_p_ss_categoryEarly      0.1891186   0.1575558   1.200  0.23013
## pds_p_ss_categoryLate      0.8109628   1.0971038   0.739  0.45987
## pds_p_ss_categoryMid      0.6734195   0.2996575   2.247  0.02471 *
## race.ethnicity.5levelBlack    -0.1830931   0.4995911  -0.366  0.71404
## race.ethnicity.5levelMixed     0.5452541   0.4874615   1.119  0.26344
## race.ethnicity.5levelOther     0.3183094   0.5558703   0.573  0.56695
## race.ethnicity.5levelWhite     0.6990210   0.4583198   1.525  0.12735
## interview_age      -0.0091346   0.0084749  -1.078  0.28122
## bmi      -0.0026732   0.0176075  -0.152  0.87934
## household.income[>=200K]    -1.2422942   0.4787484  -2.595  0.00952 **
## household.income[100K-200K]  -0.9591811   0.4483000  -2.140  0.03249 *
## household.income[12K-16K]     0.0801324   0.5788828   0.138  0.88992
## household.income[16K-25K]    -0.1464274   0.4812765  -0.304  0.76097
## household.income[25K-35K]    -0.2255259   0.4826112  -0.467  0.64033
## household.income[35K-50K]    -0.3493459   0.4571370  -0.764  0.44482
## household.income[50K-75K]    -0.7693275   0.4430938  -1.736  0.08265 .
## household.income[5K-12K]     0.0286754   0.4962132   0.058  0.95392
## household.income[75K-100K]   -0.9516853   0.4564449  -2.085  0.03718 *
## high.educBachelor      1.0638358   0.4469682   2.380  0.01739 *
## high.educHS Diploma/GED    -0.1280968   0.4441790  -0.288  0.77307
## high.educPost Graduate Degree  0.7201440   0.4494900   1.602  0.10926
## high.educSome College     0.6442689   0.4261717   1.512  0.13073
## demo_race_hispanic1      0.0798369   0.2004185   0.398  0.69041
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0158
## lmer.REML = 12122 Scale est. = 5.9308    n = 2392

```

## 1.17 Model: CBCL Withdrawn-Depressed ~ Testosterone + PDS

### Females

```

##
## 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)      0.4749241   0.6774111   0.701  0.483324
## hormone_scr_ert_mean      0.0028502   0.0022259   1.280  0.200527
## hormone_sal_end_min_since_midnight -0.0000571   0.0002066  -0.276  0.782284
## PDS_score      0.1591141   0.0534745   2.976  0.002957 **
## race.ethnicity.5levelBlack    -0.4903843   0.2390417  -2.051  0.040342 *
## race.ethnicity.5levelMixed    -0.0292756   0.2322633  -0.126  0.899708

```

```
## race.ethnicity.5levelOther      -0.3485297  0.2739778  -1.272  0.203471
## race.ethnicity.5levelWhite      -0.0453880  0.2158951  -0.210  0.833507
## interview_age                   0.0032131  0.0048217   0.666  0.505239
## bmi                             0.0134666  0.0095711   1.407  0.159568
## household.income[>=200K]        -0.9084967  0.2541282  -3.575  0.000358 ***
## household.income[100K-200K]     -0.6695469  0.2356401  -2.841  0.004534 **
## household.income[12K-16K]       -0.3862945  0.3043186  -1.269  0.204443
## household.income[16K-25K]       -0.3259204  0.2631970  -1.238  0.215734
## household.income[25K-35K]       -0.1524759  0.2463780  -0.619  0.536067
## household.income[35K-50K]       -0.5910347  0.2398287  -2.464  0.013801 *
## household.income[50K-75K]       -0.5671819  0.2353323  -2.410  0.016029 *
## household.income[5K-12K]        -0.1308079  0.2715993  -0.482  0.630124
## household.income[75K-100K]      -0.5921637  0.2389930  -2.478  0.013297 *
## high.educBachelor               0.1356108  0.2210308   0.614  0.539585
## high.educHS Diploma/GED         0.4057324  0.2223492   1.825  0.068176 .
## high.educPost Graduate Degree    0.1914676  0.2252086   0.850  0.395319
## high.educSome College            0.2064858  0.2064999   1.000  0.317455
## demo_race_hispanic1             -0.0060614  0.1056212  -0.057  0.954241
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0237
## lmer.REML = 8254.3  Scale est. = 2.269      n = 2194
```

## Males

```
##
## 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)    0.1210785   0.7316064   0.165  0.868567
## hormone_scr_ert_mean 0.0030457   0.0025548   1.192  0.233326
## hormone_sal_end_min_since_midnight 0.0005051   0.0002140   2.361  0.018319 *
## PDS_score       0.1250441   0.0734936   1.701  0.088994 .
## race.ethnicity.5levelBlack -0.1500621   0.2906197  -0.516  0.605657
## race.ethnicity.5levelMixed  0.2911696   0.2836000   1.027  0.304671
## race.ethnicity.5levelOther  0.0596001   0.3235077   0.184  0.853848
## race.ethnicity.5levelWhite  0.1510061   0.2660351   0.568  0.570349
## interview_age    0.0108037   0.0049315   2.191  0.028566 *
## bmi             -0.0039389   0.0102866  -0.383  0.701818
## household.income[>=200K] -1.0686353   0.2776444  -3.849  0.000122 ***
## household.income[100K-200K] -0.9173209   0.2603617  -3.523  0.000434 ***
## household.income[12K-16K]  0.0162723   0.3370316   0.048  0.961496
## household.income[16K-25K]  0.0340416   0.2800115   0.122  0.903248
## household.income[25K-35K] -0.2643667   0.2799827  -0.944  0.345151
## household.income[35K-50K] -0.5123120   0.2659859  -1.926  0.054213 .
```



```
## household.income[50K-75K]          -0.6834367  0.2578363  -2.651  0.008087  **
## household.income[5K-12K]           -0.0680754  0.2891557  -0.235  0.813897
## household.income[75K-100K]         -0.9691185  0.2654896  -3.650  0.000268  ***
## high.educBachelor                  -0.0757598  0.2598697  -0.292  0.770672
## high.educHS Diploma/GED            -0.5706863  0.2579884  -2.212  0.027057  *
## high.educPost Graduate Degree       -0.3465747  0.2614709  -1.325  0.185140
## high.educSome College               -0.1541558  0.2474723  -0.623  0.533396
## demo_race_hispanic1                -0.1526033  0.1121602  -1.361  0.173775
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0399
## lmer.REML = 9561.5  Scale est. = 1.9101    n = 2392
```

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

### Females

```
##
## 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)    5.779e-01  7.004e-01   0.825  0.409458
## hormone_scr_ert_mean  3.360e-03  2.219e-03   1.515  0.130034
## hormone_sal_end_min_since_midnight -6.178e-05  2.072e-04  -0.298  0.765552
## pds_p_ss_categoryEarly  1.200e-02  9.357e-02   0.128  0.897927
## pds_p_ss_categoryLate  2.747e-01  2.422e-01   1.134  0.256893
## pds_p_ss_categoryMid   1.660e-01  9.186e-02   1.807  0.070923 .
## race.ethnicity.5levelBlack -4.645e-01  2.392e-01  -1.942  0.052254 .
## race.ethnicity.5levelMixed -1.629e-02  2.326e-01  -0.070  0.944172
## race.ethnicity.5levelOther -3.355e-01  2.744e-01  -1.223  0.221597
## race.ethnicity.5levelWhite -3.734e-02  2.162e-01  -0.173  0.862882
## interview_age        3.902e-03  4.930e-03   0.791  0.428772
## bmi                  1.259e-02  9.921e-03   1.269  0.204590
## household.income[>=200K] -9.187e-01  2.548e-01  -3.605  0.000319 ***
## household.income[100K-200K] -6.756e-01  2.364e-01  -2.859  0.004295 **
## household.income[12K-16K]  -4.199e-01  3.047e-01  -1.378  0.168289
## household.income[16K-25K]  -3.334e-01  2.638e-01  -1.264  0.206383
## household.income[25K-35K]  -1.749e-01  2.469e-01  -0.709  0.478708
## household.income[35K-50K]  -6.094e-01  2.402e-01  -2.538  0.011233 *
## household.income[50K-75K]  -5.772e-01  2.358e-01  -2.447  0.014465 *
## household.income[5K-12K]   -1.407e-01  2.721e-01  -0.517  0.605066
## household.income[75K-100K] -6.070e-01  2.395e-01  -2.535  0.011325 *
## high.educBachelor          1.326e-01  2.218e-01   0.598  0.550115
## high.educHS Diploma/GED    4.100e-01  2.228e-01   1.841  0.065802 .
## high.educPost Graduate Degree  1.908e-01  2.260e-01   0.844  0.398659
## high.educSome College      2.205e-01  2.071e-01   1.064  0.287263
```

```
## demo_race_hispanic1          -1.817e-02  1.058e-01  -0.172 0.863593
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0211
## lmer.REML = 8261.8  Scale est. = 2.2679    n = 2194
```

## Males

```
##
## 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)      0.1649316   0.7331693   0.225 0.822032
## hormone_scr_ert_mean      0.0032779   0.0025503   1.285 0.198804
## hormone_sal_end_min_since_midnight 0.0005027   0.0002140   2.349 0.018908 *
## pds_p_ss_categoryEarly      0.0583880   0.0916737   0.637 0.524245
## pds_p_ss_categoryLate     -0.4175227   0.6397450  -0.653 0.514052
## pds_p_ss_categoryMid       0.3358230   0.1747243   1.922 0.054724 .
## race.ethnicity.5levelBlack -0.1305392   0.2903494  -0.450 0.653045
## race.ethnicity.5levelMixed  0.3107114   0.2837552   1.095 0.273629
## race.ethnicity.5levelOther  0.0751994   0.3236650   0.232 0.816296
## race.ethnicity.5levelWhite  0.1737322   0.2663249   0.652 0.514251
## interview_age          0.0113619   0.0049189   2.310 0.020983 *
## bmi                   -0.0030252   0.0102536  -0.295 0.767993
## household.income[>=200K]    -1.0834066   0.2780778  -3.896 0.000100 ***
## household.income[100K-200K] -0.9315989   0.2608504  -3.571 0.000362 ***
## household.income[12K-16K]   -0.0093701   0.3377168  -0.028 0.977868
## household.income[16K-25K]    0.0263261   0.2804957   0.094 0.925232
## household.income[25K-35K]   -0.2680368   0.2812960  -0.953 0.340756
## household.income[35K-50K]   -0.5269732   0.2665738  -1.977 0.048176 *
## household.income[50K-75K]   -0.6916502   0.2581453  -2.679 0.007429 **
## household.income[5K-12K]    -0.0816377   0.2895921  -0.282 0.778040
## household.income[75K-100K]  -0.9845581   0.2658690  -3.703 0.000218 ***
## high.educBachelor          -0.0756942   0.2599197  -0.291 0.770908
## high.educHS Diploma/GED    -0.5843168   0.2582688  -2.262 0.023761 *
## high.educPost Graduate Degree -0.3459077   0.2615192  -1.323 0.186068
## high.educSome College      -0.1624445   0.2476542  -0.656 0.511931
## demo_race_hispanic1        -0.1602872   0.1122593  -1.428 0.153473
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0402
## lmer.REML = 9560.3  Scale est. = 1.9183    n = 2392
```

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

### Females

```
##
## 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)    0.7329447  0.7922449   0.925  0.35499
## hormone_scr_ert_mean -0.0006339  0.0026033  -0.243  0.80764
## hormone_sal_end_min_since_midnight 0.0001436  0.0002405   0.597  0.55059
## PDS_score       0.1121565  0.0626583   1.790  0.07360 .
## race.ethnicity.5levelBlack -0.1981417  0.2805824  -0.706  0.48015
## race.ethnicity.5levelMixed  0.2021829  0.2729169   0.741  0.45888
## race.ethnicity.5levelOther -0.2566456  0.3221469  -0.797  0.42573
## race.ethnicity.5levelWhite  0.2570199  0.2533572   1.014  0.31048
## interview_age     0.0026545  0.0056264   0.472  0.63713
## bmi              0.0103957  0.0112319   0.926  0.35478
## household.income[>=200K] -0.8101511  0.2993534  -2.706  0.00686 **
## household.income[100K-200K] -0.6652596  0.2777634  -2.395  0.01670 *
## household.income[12K-16K] -0.0928040  0.3593345  -0.258  0.79623
## household.income[16K-25K] -0.4328090  0.3094806  -1.399  0.16211
## household.income[25K-35K] -0.1500203  0.2904260  -0.517  0.60552
## household.income[35K-50K] -0.4022745  0.2824866  -1.424  0.15458
## household.income[50K-75K] -0.5263118  0.2774590  -1.897  0.05797 .
## household.income[5K-12K] -0.0307932  0.3190285  -0.097  0.92312
## household.income[75K-100K] -0.5404168  0.2816470  -1.919  0.05514 .
## high.educBachelor -0.1294081  0.2605665  -0.497  0.61949
## high.educHS Diploma/GED -0.0097230  0.2615916  -0.037  0.97035
## high.educPost Graduate Degree  0.0640450  0.2654093   0.241  0.80934
## high.educSome College -0.0166985  0.2433245  -0.069  0.94529
## demo_race_hispanic1 -0.0419100  0.1240251  -0.338  0.73546
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00929
## lmer.REML = 8927.5  Scale est. = 2.5026    n = 2194
```

### Males

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

```

##      household.income + high.educ + demo_race_hispanic
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.1021646   0.8525860    1.293 0.196230
## hormone_scr_ert_mean      0.0021680   0.0029846    0.726 0.467657
## hormone_sal_end_min_since_midnight 0.0004086   0.0002567    1.592 0.111523
## PDS_score          0.1265043   0.0852259    1.484 0.137852
## race.ethnicity.5levelBlack      -0.1445429   0.3399892   -0.425 0.670773
## race.ethnicity.5levelMixed      0.2321299   0.3314363    0.700 0.483762
## race.ethnicity.5levelOther      0.0599617   0.3770031    0.159 0.873644
## race.ethnicity.5levelWhite      0.1984459   0.3114214    0.637 0.524039
## interview_age          0.0044596   0.0057255    0.779 0.436121
## bmi                -0.0065586   0.0119329   -0.550 0.582632
## household.income[>=200K]      -1.1623989   0.3243165   -3.584 0.000345 ***
## household.income[100K-200K]    -1.1443263   0.3036237   -3.769 0.000168 ***
## household.income[12K-16K]       0.0879132   0.3923957    0.224 0.822744
## household.income[16K-25K]      -0.4155784   0.3259138   -1.275 0.202393
## household.income[25K-35K]      -0.6059773   0.3259532   -1.859 0.063138 .
## household.income[35K-50K]      -0.7714113   0.3096712   -2.491 0.012804 *
## household.income[50K-75K]      -0.8493779   0.3003449   -2.828 0.004723 **
## household.income[5K-12K]       -0.2274147   0.3364261   -0.676 0.499124
## household.income[75K-100K]     -0.9933782   0.3094126   -3.211 0.001343 **
## high.educBachelor          0.2599197   0.3031834    0.857 0.391365
## high.educHS Diploma/GED      -0.3944860   0.3009271   -1.311 0.190018
## high.educPost Graduate Degree  -0.0613831   0.3049360   -0.201 0.840483
## high.educSome College         0.2518553   0.2887948    0.872 0.383247
## demo_race_hispanic1         -0.1346305   0.1348056   -0.999 0.318041
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0258
## lmer.REML = 10264 Scale est. = 2.1931    n = 2392

```

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

### Females

```

##
## 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)      0.8478270   0.8185592    1.036 0.30043
## hormone_scr_ert_mean      -0.0004206   0.0025923   -0.162 0.87114
## hormone_sal_end_min_since_midnight 0.0001385   0.0002411    0.574 0.56578
## pds_p_ss_categoryEarly      0.0159055   0.1092878    0.146 0.88430
## pds_p_ss_categoryLate      0.1266151   0.2834960    0.447 0.65519

```

```

## pds_p_ss_categoryMid          0.1538762  0.1074603   1.432  0.15231
## race.ethnicity.5levelBlack    -0.1879642  0.2804143  -0.670  0.50273
## race.ethnicity.5levelMixed     0.2060143  0.2730257   0.755  0.45059
## race.ethnicity.5levelOther    -0.2489929  0.3222349  -0.773  0.43978
## race.ethnicity.5levelWhite     0.2596160  0.2534493   1.024  0.30579
## interview_age                  0.0028242  0.0057495   0.491  0.62333
## bmi                           0.0091407  0.0116286   0.786  0.43192
## household.income[>=200K]      -0.8059592  0.2997868  -2.688  0.00723 **
## household.income[100K-200K]   -0.6596126  0.2782410  -2.371  0.01784 *
## household.income[12K-16K]     -0.1107718  0.3592581  -0.308  0.75786
## household.income[16K-25K]     -0.4309941  0.3097888  -1.391  0.16429
## household.income[25K-35K]     -0.1582130  0.2906851  -0.544  0.58631
## household.income[35K-50K]     -0.4099075  0.2825349  -1.451  0.14697
## household.income[50K-75K]     -0.5262291  0.2776918  -1.895  0.05822 .
## household.income[5K-12K]      -0.0334329  0.3192385  -0.105  0.91660
## household.income[75K-100K]    -0.5419942  0.2818604  -1.923  0.05462 .
## high.educBachelor             -0.1385506  0.2610855  -0.531  0.59570
## high.educHS Diploma/GED       -0.0103984  0.2617359  -0.040  0.96831
## high.educPost Graduate Degree   0.0553668  0.2660060   0.208  0.83514
## high.educSome College          -0.0144021  0.2437156  -0.059  0.95288
## demo_race_hispanic1           -0.0491056  0.1240621  -0.396  0.69228
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00826
## lmer.REML = 8930.8  Scale est. = 2.5265    n = 2194

```

## Males

```

##
## 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)    1.1964262   0.8544812   1.400  0.161591
## hormone_scr_ert_mean 0.0022036   0.0029790   0.740  0.459537
## hormone_sal_end_min_since_midnight 0.0004081   0.0002567   1.589  0.112091
## pds_p_ss_categoryEarly 0.1834946   0.1064296   1.724  0.084822 .
## pds_p_ss_categoryLate  0.7085454   0.7439173   0.952  0.340965
## pds_p_ss_categoryMid   0.1661096   0.2024511   0.820  0.412018
## race.ethnicity.5levelBlack -0.1444953   0.3397461  -0.425  0.670654
## race.ethnicity.5levelMixed  0.2377308   0.3316892   0.717  0.473613
## race.ethnicity.5levelOther  0.0612591   0.3772324   0.162  0.871012
## race.ethnicity.5levelWhite  0.2137548   0.3118083   0.686  0.493075
## interview_age         0.0044071   0.0057105   0.772  0.440340
## bmi                  -0.0065873   0.0118946  -0.554  0.579763
## household.income[>=200K] -1.1556517   0.3248568  -3.557  0.000382 ***

```

```
## household.income[100K-200K]      -1.1358979  0.3042078  -3.734  0.000193 ***
## household.income[12K-16K]         0.1013785  0.3932424   0.258  0.796582
## household.income[16K-25K]        -0.4198107  0.3265107  -1.286  0.198657
## household.income[25K-35K]        -0.6091202  0.3275091  -1.860  0.063030 .
## household.income[35K-50K]        -0.7672763  0.3103915  -2.472  0.013507 *
## household.income[50K-75K]        -0.8454586  0.3007320  -2.811  0.004974 **
## household.income[5K-12K]         -0.2202183  0.3369827  -0.654  0.513497
## household.income[75K-100K]       -0.9903424  0.3098685  -3.196  0.001412 **
## high.educBachelor                 0.2714424  0.3032550   0.895  0.370827
## high.educHS Diploma/GED         -0.3803427  0.3012675  -1.262  0.206902
## high.educPost Graduate Degree    -0.0504596  0.3050170  -0.165  0.868618
## high.educSome College             0.2615563  0.2890140   0.905  0.365560
## demo_race_hispanic1              -0.1350656  0.1349265  -1.001  0.316914
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0254
## lmer.REML = 10262  Scale est. = 2.1894    n = 2392
```

## 2—Reward~Puberty—

### 2.1 Model: BIS-BAS-RR ~ PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##    demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.089238   0.344676  -0.259  0.79573
## PDS_score      -0.007565   0.030015  -0.252  0.80104
## interview_age  -0.003010   0.002746  -1.096  0.27305
## bmi             0.011552   0.005309   2.176  0.02966 *
## race.ethnicity.5levelBlack  0.502314   0.132274   3.798  0.00015 ***
## race.ethnicity.5levelMixed  0.111799   0.132722   0.842  0.39967
## race.ethnicity.5levelOther  0.044123   0.153613   0.287  0.77395
## race.ethnicity.5levelWhite  0.114323   0.122459   0.934  0.35062
## demo_race_hispanic1    0.129530   0.057889   2.238  0.02533 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0259
## lmer.REML = 7293.4  Scale est. = 0.7301    n = 2586
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##      demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0942005   0.3244514   0.290   0.7716
## PDS_score       0.0418480   0.0350873   1.193   0.2331
## interview_age   -0.0017643   0.0024791  -0.712   0.4767
## bmi             0.0004298   0.0049873   0.086   0.9313
## race.ethnicity.5levelBlack  0.2319992   0.1341319   1.730   0.0838 .
## race.ethnicity.5levelMixed  0.0803373   0.1336581   0.601   0.5478
## race.ethnicity.5levelOther -0.1035051   0.1519888  -0.681   0.4959
## race.ethnicity.5levelWhite  0.0913172   0.1246721   0.732   0.4640
## demo_race_hispanic1        0.0885605   0.0538644   1.644   0.1003
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00422
## lmer.REML = 7782.8  Scale est. = 0.78228   n = 2805
```

## 2.2 Model : Reaction Time ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##      demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.750821    0.349974  -2.145   0.0320 *
## PDS_score      0.025375    0.031097   0.816   0.4146
## interview_age   0.004889    0.002813   1.738   0.0823 .
## bmi            0.004964    0.005436   0.913   0.3612
## race.ethnicity.5levelBlack  0.017532    0.130358   0.134   0.8930
## race.ethnicity.5levelMixed  0.048441    0.130630   0.371   0.7108
## race.ethnicity.5levelOther  0.117075    0.151546   0.773   0.4399
## race.ethnicity.5levelWhite  0.105784    0.119701   0.884   0.3769
## demo_race_hispanic1       -0.072771    0.055518  -1.311   0.1901
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) = 0.000878
## lmer.REML = 5837.2 Scale est. = 0.75307 n = 2160

##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.494350   0.365275  -1.353   0.176
## PDS_score       0.007616   0.032405   0.235   0.814
## interview_age   0.003565   0.002936   1.214   0.225
## bmi            0.008551   0.005650   1.513   0.130
## race.ethnicity.5levelBlack -0.150438  0.137052  -1.098   0.272
## race.ethnicity.5levelMixed -0.142615  0.136683  -1.043   0.297
## race.ethnicity.5levelOther -0.052226  0.158278  -0.330   0.741
## race.ethnicity.5levelWhite -0.076914  0.125648  -0.612   0.541
## demo_race_hispanic1  -0.031098  0.059815  -0.520   0.603
##
##
## R-sq.(adj) = -0.000441
## lmer.REML = 6002.4 Scale est. = 0.81009 n = 2160
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.920924   0.347621  -2.649 0.00812 **
## PDS_score      -0.042088   0.038313  -1.099 0.27210
## interview_age   0.005656   0.002625   2.155 0.03127 *
## bmi            0.001940   0.005479   0.354 0.72331
## race.ethnicity.5levelBlack  0.184563  0.148421   1.244 0.21381
## race.ethnicity.5levelMixed  0.382051  0.147703   2.587 0.00976 **
## race.ethnicity.5levelOther  0.206136  0.166831   1.236 0.21674
## race.ethnicity.5levelWhite  0.255492  0.137815   1.854 0.06389 .
## demo_race_hispanic1  -0.039169  0.056759  -0.690 0.49021
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00622
## lmer.REML = 6034.8 Scale est. = 0.78339 n = 2243
```



```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##     demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -8.294e-02  3.379e-01  -0.245    0.806
## PDS_score      -4.519e-02  3.767e-02  -1.200    0.230
## interview_age    6.964e-05  2.580e-03   0.027    0.978
## bmi             1.644e-03  5.393e-03   0.305    0.761
## race.ethnicity.5levelBlack  1.791e-01  1.358e-01   1.318    0.188
## race.ethnicity.5levelMixed  1.317e-01  1.357e-01   0.971    0.332
## race.ethnicity.5levelOther -2.737e-03  1.558e-01  -0.018    0.986
## race.ethnicity.5levelWhite  5.734e-02  1.253e-01   0.458    0.647
## demo_race_hispanic1    9.052e-02  5.435e-02   1.665    0.096 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000335
## lmer.REML =  5979  Scale est. = 0.82782  n = 2243
```

## 2.3 Model: Caudate Anticipation ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##     demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.360998  0.349493  -1.033    0.302
## PDS_score      -0.024853  0.030807  -0.807    0.420
## interview_age    0.004533  0.002804   1.617    0.106
## bmi            -0.005943  0.005517  -1.077    0.282
## race.ethnicity.5levelBlack  0.023881  0.131746   0.181    0.856
## race.ethnicity.5levelMixed -0.077787  0.130740  -0.595    0.552
## race.ethnicity.5levelOther -0.193473  0.155000  -1.248    0.212
## race.ethnicity.5levelWhite -0.022230  0.120278  -0.185    0.853
## demo_race_hispanic1    -0.047991  0.057461  -0.835    0.404
##
##
## R-sq.(adj) =  0.00178
## lmer.REML = 5243.1  Scale est. = 0.74174  n = 1997
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsnt_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##   demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.022587   0.363817  -0.062   0.9505
## PDS_score        0.058453   0.041606   1.405   0.1602
## interview_age    0.002986   0.002772   1.077   0.2816
## bmi             -0.009464   0.005841  -1.620   0.1053
## race.ethnicity.5levelBlack -0.324303   0.146628  -2.212   0.0271 *
## race.ethnicity.5levelMixed -0.146873   0.145192  -1.012   0.3119
## race.ethnicity.5levelOther -0.308522   0.167619  -1.841   0.0658 .
## race.ethnicity.5levelWhite -0.235818   0.134434  -1.754   0.0796 .
## demo_race_hispanic1    -0.023936   0.061918  -0.387   0.6991
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0028
## lmer.REML =  5377  Scale est. = 0.84216  n = 1996
```

## 2.4 Model B: Putamen Anticipation ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsnt_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##   demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.458606   0.345367  -1.328   0.1844
## PDS_score       -0.006585   0.030456  -0.216   0.8289
## interview_age    0.005309   0.002770   1.917   0.0554 .
## bmi             -0.005673   0.005487  -1.034   0.3013
## race.ethnicity.5levelBlack -0.008207   0.130188  -0.063   0.9497
## race.ethnicity.5levelMixed -0.133518   0.129287  -1.033   0.3019
## race.ethnicity.5levelOther -0.225697   0.153025  -1.475   0.1404
## race.ethnicity.5levelWhite -0.047775   0.118831  -0.402   0.6877
## demo_race_hispanic1    -0.066094   0.056658  -1.167   0.2435
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) = 0.00369
## lmer.REML = 5197.6 Scale est. = 0.69738 n = 1997
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsnt_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.016000  0.359411  -0.045  0.9645
## PDS_score       0.017631  0.040590   0.434  0.6641
## interview_age   0.002847  0.002696   1.056  0.2911
## bmi            -0.008583  0.005691  -1.508  0.1317
## race.ethnicity.5levelBlack -0.222225  0.156868  -1.417  0.1567
## race.ethnicity.5levelMixed -0.119976  0.155264  -0.773  0.4398
## race.ethnicity.5levelOther -0.396349  0.174934  -2.266  0.0236 *
## race.ethnicity.5levelWhite -0.178957  0.145569  -1.229  0.2191
## demo_race_hispanic1    0.040127  0.059897   0.670  0.5030
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00294
## lmer.REML = 5268.1 Scale est. = 0.66025 n = 1999
```

## 2.5 Model: Accumbens Anticipation ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3058689  0.2729870   1.120  0.2627
## PDS_score      -0.0396986  0.0240820  -1.648  0.0994 .
## interview_age  -0.0002696  0.0021884  -0.123  0.9020
## bmi            -0.0036291  0.0043579  -0.833  0.4051
## race.ethnicity.5levelBlack -0.0276958  0.1020694  -0.271  0.7862
## race.ethnicity.5levelMixed -0.1367521  0.1018640  -1.342  0.1796
## race.ethnicity.5levelOther -0.1688622  0.1206057  -1.400  0.1616
## race.ethnicity.5levelWhite -0.1452421  0.0932419  -1.558  0.1195
## demo_race_hispanic1   -0.0418831  0.0437930  -0.956  0.3390
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00256
## lmer.REML = 4262.1  Scale est. = 0.45987    n = 1992
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##      demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.224638   0.292900   0.767   0.443
## PDS_score       0.033794   0.032925   1.026   0.305
## interview_age  -0.001648   0.002197  -0.750   0.453
## bmi            -0.002305   0.004640  -0.497   0.619
## race.ethnicity.5levelBlack -0.072306   0.128033  -0.565   0.572
## race.ethnicity.5levelMixed -0.023129   0.126769  -0.182   0.855
## race.ethnicity.5levelOther -0.058695   0.142841  -0.411   0.681
## race.ethnicity.5levelWhite -0.015548   0.118677  -0.131   0.896
## demo_race_hispanic1 -0.002233   0.048163  -0.046   0.963
##
##
## R-sq.(adj) = -0.00156
## lmer.REML = 4460.6  Scale est. = 0.44564    n = 1997
```

## 2.6 Model: Caudate Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##      race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.018041   0.342426   0.053   0.958
## PDS_score       0.059883   0.030129   1.988   0.047 *
## interview_age  -0.001618   0.002741  -0.590   0.555
## bmi            0.002513   0.005405   0.465   0.642
## race.ethnicity.5levelBlack -0.121822   0.130214  -0.936   0.350
## race.ethnicity.5levelMixed -0.021581   0.129045  -0.167   0.867
## race.ethnicity.5levelOther -0.092090   0.152105  -0.605   0.545
## race.ethnicity.5levelWhite  0.031216   0.118801   0.263   0.793
## demo_race_hispanic1    0.047810   0.056665   0.844   0.399
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00108
## lmer.REML = 5136.3  Scale est. = 0.62341    n = 1994
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0365557  0.3561875   0.103   0.918
## PDS_score       0.0116936  0.0401834   0.291   0.771
## interview_age   0.0002601  0.0026809   0.097   0.923
## bmi             0.0021305  0.0056560   0.377   0.706
## race.ethnicity.5levelBlack -0.1721731  0.1522436  -1.131   0.258
## race.ethnicity.5levelMixed -0.0667872  0.1507693  -0.443   0.658
## race.ethnicity.5levelOther  0.0134889  0.1705462   0.079   0.937
## race.ethnicity.5levelWhite -0.1143564  0.1409961  -0.811   0.417
## demo_race_hispanic1    -0.0527302  0.0572087  -0.922   0.357
##
##
## R-sq.(adj) =  -0.00209
## lmer.REML = 5244.6  Scale est. = 0.77785    n = 1992
```

## 2.7 Model: Putamen Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1703305  0.3388983   0.503   0.615
## PDS_score       0.0456188  0.0298415   1.529   0.126
## interview_age   -0.0019503  0.0027156  -0.718   0.473
## bmi             0.0001132  0.0053529   0.021   0.983
## race.ethnicity.5levelBlack -0.0692248  0.1286060  -0.538   0.590
## race.ethnicity.5levelMixed -0.0981298  0.1271176  -0.772   0.440
## race.ethnicity.5levelOther -0.0986101  0.1499348  -0.658   0.511
## race.ethnicity.5levelWhite -0.0164609  0.1172247  -0.140   0.888
```

```
## demo_race_hispanic1      0.0474019  0.0572677   0.828    0.408
##
##
## R-sq.(adj) =  -0.00129
## lmer.REML = 5097.7  Scale est. = 0.70922   n = 1994
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.338586   0.356828   0.949   0.343
## PDS_score       0.043510   0.039931   1.090   0.276
## interview_age  -0.002944   0.002681  -1.098   0.272
## bmi             0.006212   0.005615   1.106   0.269
## race.ethnicity.5levelBlack -0.204623   0.154772  -1.322   0.186
## race.ethnicity.5levelMixed -0.129145   0.152804  -0.845   0.398
## race.ethnicity.5levelOther -0.107004   0.172237  -0.621   0.534
## race.ethnicity.5levelWhite -0.115477   0.143254  -0.806   0.420
## demo_race_hispanic1  -0.036215   0.061028  -0.593   0.553
##
##
## R-sq.(adj) =  -0.00171
## lmer.REML = 5237.4  Scale est. = 0.72453   n = 1997
```

## 2.8 Model: Accumbens Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.340224   0.268476  -1.267   0.205
## PDS_score     0.032140   0.023701   1.356   0.175
## interview_age  0.001946   0.002152   0.904   0.366
## bmi           0.002177   0.004237   0.514   0.607
## race.ethnicity.5levelBlack -0.093463   0.101711  -0.919   0.358
## race.ethnicity.5levelMixed -0.029413   0.100872  -0.292   0.771
## race.ethnicity.5levelOther -0.091545   0.118842  -0.770   0.441
## race.ethnicity.5levelWhite  0.012995   0.092824   0.140   0.889
## demo_race_hispanic1    0.043736   0.044246   0.988   0.323
```

```
##
##
## R-sq.(adj) = 0.00163
## lmer.REML = 4172.2 Scale est. = 0.43687 n = 1993
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##     race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.071681   0.294250  -0.244   0.808
## PDS_score     -0.018541   0.032858  -0.564   0.573
## interview_age  0.000136   0.002196   0.062   0.951
## bmi           0.006014   0.004643   1.295   0.195
## race.ethnicity.5levelBlack -0.147968   0.131019  -1.129   0.259
## race.ethnicity.5levelMixed  0.010982   0.129747   0.085   0.933
## race.ethnicity.5levelOther -0.003082   0.145216  -0.021   0.983
## race.ethnicity.5levelWhite  0.001569   0.121978   0.013   0.990
## demo_race_hispanic1    -0.011081   0.049218  -0.225   0.822
##
##
## R-sq.(adj) = 0.00121
## lmer.REML = 4446.1 Scale est. = 0.3879 n = 1999
```

## 2.9 Model: OFC Anticipation ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvsnt_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##     demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0038399   0.2199474  -0.017   0.986
## PDS_score     -0.0162156   0.0194860  -0.832   0.405
## interview_age  0.0005750   0.0017630   0.326   0.744
## bmi           0.0003107   0.0034700   0.090   0.929
## race.ethnicity.5levelBlack -0.0129328   0.0831687  -0.156   0.876
## race.ethnicity.5levelMixed -0.0570427   0.0824376  -0.692   0.489
## race.ethnicity.5levelOther -0.1114115   0.0972611  -1.145   0.252
## race.ethnicity.5levelWhite -0.0431882   0.0758270  -0.570   0.569
## demo_race_hispanic1    0.0033889   0.0359237   0.094   0.925
##
```

```
##
## R-sq.(adj) = -0.00245
## lmer.REML = 3365.4  Scale est. = 0.30954  n = 1984

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvs_n_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##      demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.986e-01  2.549e-01   0.779  0.43614
## PDS_score      -6.076e-02  2.250e-02  -2.701  0.00698 **
## interview_age   1.313e-05  2.043e-03   0.006  0.99487
## bmi            -5.012e-04  4.020e-03  -0.125  0.90080
## race.ethnicity.5levelBlack -4.805e-02  9.635e-02  -0.499  0.61806
## race.ethnicity.5levelMixed -9.474e-02  9.562e-02  -0.991  0.32192
## race.ethnicity.5levelOther -1.818e-01  1.125e-01  -1.616  0.10627
## race.ethnicity.5levelWhite -1.152e-01  8.792e-02  -1.310  0.19039
## demo_race_hispanic1    1.523e-02  4.173e-02   0.365  0.71529
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##
## R-sq.(adj) = 0.00176
## lmer.REML = 3947.9  Scale est. = 0.41694  n = 1985
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvs_n_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
##      demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.357960  0.249757  -1.433  0.1519
## PDS_score      0.032036  0.028403   1.128  0.2595
## interview_age   0.003292  0.001876   1.755  0.0795 .
## bmi           -0.001361  0.003952  -0.344  0.7306
## race.ethnicity.5levelBlack -0.110017  0.108787  -1.011  0.3120
## race.ethnicity.5levelMixed -0.023026  0.107565  -0.214  0.8305
## race.ethnicity.5levelOther -0.085256  0.120826  -0.706  0.4805
## race.ethnicity.5levelWhite -0.069328  0.100706  -0.688  0.4913
## demo_race_hispanic1   -0.080315  0.041695  -1.926  0.0542 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##
##
```



```
## R-sq.(adj) = 0.00431
## lmer.REML = 3789.6 Scale est. = 0.33834 n = 1986

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsnt_ant_z ~ PDS_score + interview_age + bmi + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0807249  0.2856520  -0.283   0.778
## PDS_score      0.0477146  0.0324550   1.470   0.142
## interview_age  0.0009307  0.0021430   0.434   0.664
## bmi           -0.0007838  0.0045245  -0.173   0.862
## race.ethnicity.5levelBlack -0.0750355  0.1242022  -0.604   0.546
## race.ethnicity.5levelMixed -0.0949166  0.1229654  -0.772   0.440
## race.ethnicity.5levelOther -0.1258638  0.1382965  -0.910   0.363
## race.ethnicity.5levelWhite -0.0977365  0.1151690  -0.849   0.396
## demo_race_hispanic1 -0.0504810  0.0453175  -1.114   0.265
##
##
## R-sq.(adj) = 0.00214
## lmer.REML = 4353 Scale est. = 0.44997 n = 1993
```

## 2.10 Model: OFC Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
## race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.150763  0.198653  0.759  0.4480
## PDS_score      0.020428  0.017581  1.162  0.2454
## interview_age  -0.001614  0.001597  -1.011  0.3123
## bmi           0.001304  0.003138  0.415  0.6779
## race.ethnicity.5levelBlack -0.138086  0.074812  -1.846  0.0651
## race.ethnicity.5levelMixed -0.062906  0.074157  -0.848  0.3964
## race.ethnicity.5levelOther  0.034800  0.087696  0.397  0.6915
## race.ethnicity.5levelWhite -0.036504  0.068198  -0.535  0.5925
## demo_race_hispanic1  0.001347  0.032765  0.041  0.9672
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00217
```

```
## lmer.REML = 2988.4  Scale est. = 0.2535    n = 1994
##
## Family: gaussian
## Link function: identity
##
## Formula:
## m0FC_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##      race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1439030  0.2341661   0.615  0.5389
## PDS_score       0.0178630  0.0207670   0.860  0.3898
## interview_age   -0.0006046  0.0018784  -0.322  0.7476
## bmi             -0.0002257  0.0037144  -0.061  0.9515
## race.ethnicity.5levelBlack -0.1947501  0.0881037  -2.210  0.0272 *
## race.ethnicity.5levelMixed -0.1475633  0.0878181  -1.680  0.0931 .
## race.ethnicity.5levelOther -0.0613405  0.1039220  -0.590  0.5551
## race.ethnicity.5levelWhite -0.1160589  0.0805111  -1.442  0.1496
## demo_race_hispanic1    0.0027776  0.0373113   0.074  0.9407
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000146
## lmer.REML = 3662.9  Scale est. = 0.32917    n = 1997
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## l0FC_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##      race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0730086  0.2185425  -0.334  0.738
## PDS_score      -0.0261759  0.0247262  -1.059  0.290
## interview_age   0.0008726  0.0016301   0.535  0.592
## bmi            0.0037991  0.0034632   1.097  0.273
## race.ethnicity.5levelBlack -0.0440901  0.0974250  -0.453  0.651
## race.ethnicity.5levelMixed -0.0309743  0.0965123  -0.321  0.748
## race.ethnicity.5levelOther -0.1289019  0.1078740  -1.195  0.232
## race.ethnicity.5levelWhite -0.0610259  0.0905054  -0.674  0.500
## demo_race_hispanic1    -0.0079587  0.0347679  -0.229  0.819
##
##
## R-sq.(adj) = -0.00118
## lmer.REML = 3253.8  Scale est. = 0.22066    n = 1985
##
```

```
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ PDS_score + interview_age + bmi +
##      race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0308196  0.2592953  -0.119   0.905
## PDS_score       -0.0236157  0.0293605  -0.804   0.421
## interview_age    0.0005692  0.0019350   0.294   0.769
## bmi             0.0039382  0.0041065   0.959   0.338
## race.ethnicity.5levelBlack -0.0116461  0.1154117  -0.101   0.920
## race.ethnicity.5levelMixed -0.0686928  0.1143157  -0.601   0.548
## race.ethnicity.5levelOther -0.1505099  0.1277995  -1.178   0.239
## race.ethnicity.5levelWhite -0.0314710  0.1072612  -0.293   0.769
## demo_race_hispanic1    -0.0412546  0.0409817  -1.007   0.314
##
##
## R-sq.(adj) =  0.000195
## lmer.REML = 3959.4  Scale est. = 0.32263   n = 1994
```

## 2.11 Model: Caudate Anticipation ~ Testosterone

### Females

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsnt_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)    -2.508e-01  3.565e-01  -0.704   0.482
## hormone_scr_ert_mean    -1.281e-03  1.292e-03  -0.992   0.321
## hormone_sal_end_min_since_midnight -1.352e-04  1.239e-04  -1.091   0.275
## interview_age    4.229e-03  2.828e-03   1.495   0.135
## MRI_minus_hormone_date_time    1.061e-06  2.635e-06   0.403   0.687
## bmi             -5.840e-03  5.562e-03  -1.050   0.294
##
##
## R-sq.(adj) =  0.000508
## lmer.REML = 4903.7  Scale est. = 0.74968   n = 1859
```

### Males

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

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvs_n_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)    -2.193e-01  3.563e-01  -0.615   0.538
## hormone_scr_ert_mean -4.539e-04  1.491e-03  -0.304   0.761
## hormone_sal_end_min_since_midnight 1.855e-04  1.257e-04   1.476   0.140
## interview_age      2.482e-03  2.814e-03   0.882   0.378
## MRI_minus_hormone_date_time  4.314e-07  2.897e-06   0.149   0.882
## bmi              -1.085e-02  5.745e-03  -1.889   0.059 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00115
## lmer.REML = 5055.2  Scale est. = 0.80253   n = 1875
```

## 2.12 Model B: Putamen Anticipation ~ Testosterone

### Females

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvs_n_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)    -2.657e-01  3.506e-01  -0.758   0.449
## hormone_scr_ert_mean 1.005e-04  1.273e-03   0.079   0.937
## hormone_sal_end_min_since_midnight -1.937e-04  1.215e-04  -1.593   0.111
## interview_age      4.141e-03  2.781e-03   1.489   0.137
## MRI_minus_hormone_date_time  1.282e-06  2.591e-06   0.495   0.621
## bmi              -5.593e-03  5.504e-03  -1.016   0.310
##
##
## R-sq.(adj) =  0.000705
## lmer.REML = 4843.8  Scale est. = 0.64702   n = 1859
```

### Males

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

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvs_n_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)    -2.773e-01  3.508e-01  -0.791   0.4293
## hormone_scr_ert_mean    -1.652e-03  1.473e-03  -1.121   0.2623
## hormone_sal_end_min_since_midnight  2.193e-04  1.238e-04   1.772   0.0765 .
## interview_age      3.102e-03  2.774e-03   1.118   0.2636
## MRI_minus_hormone_date_time    6.697e-07  2.863e-06   0.234   0.8151
## bmi             -1.049e-02  5.677e-03  -1.847   0.0649 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00255
## lmer.REML = 4998.9  Scale est. = 0.61328   n = 1875
```

## 2.13 Model: Accumbens Anticipation ~ Testosterone

### Females

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvs_n_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)    2.685e-01  2.796e-01   0.960   0.3369
## hormone_scr_ert_mean    1.317e-05  1.011e-03   0.013   0.9896
## hormone_sal_end_min_since_midnight -1.086e-04  9.423e-05  -1.152   0.2493
## interview_age    -1.979e-04  2.214e-03  -0.089   0.9288
## MRI_minus_hormone_date_time    -2.295e-07  2.051e-06  -0.112   0.9109
## bmi             -8.257e-03  4.398e-03  -1.878   0.0606 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000136
## lmer.REML = 3998.4  Scale est. = 0.41352   n = 1853
```

## Males

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

##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_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)    1.688e-01  2.833e-01   0.596   0.551
## hormone_scr_ert_mean -2.561e-04  1.192e-03  -0.215   0.830
## hormone_sal_end_min_since_midnight 1.144e-04  9.945e-05   1.150   0.250
## interview_age    -1.458e-03  2.237e-03  -0.652   0.515
## MRI_minus_hormone_date_time -3.395e-06  2.355e-06  -1.441   0.150
## bmi             -2.990e-03  4.566e-03  -0.655   0.513
##
##
## R-sq.(adj) = -0.00088
## lmer.REML = 4186.7  Scale est. = 0.43565  n = 1870
```

## 2.14 Model: Caudate Feedback ~ Testosterone

### Females

```
## 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)    6.533e-02  3.458e-01   0.189   0.8502
## hormone_scr_ert_mean -3.724e-06  1.251e-03  -0.003   0.9976
## hormone_sal_end_min_since_midnight -2.922e-04  1.211e-04  -2.413   0.0159 *
## interview_age     8.981e-04  2.742e-03   0.328   0.7433
## MRI_minus_hormone_date_time -5.379e-07  2.551e-06  -0.211   0.8330
## bmi             2.408e-03  5.390e-03   0.447   0.6551
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00178
## lmer.REML = 4764  Scale est. = 0.65794  n = 1854
```

## Males

```
## 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)      2.077e-01  3.523e-01   0.590  0.5555
## hormone_scr_ert_mean -2.567e-03  1.458e-03  -1.760  0.0786 .
## hormone_sal_end_min_since_midnight -3.060e-04  1.209e-04  -2.532  0.0114 *
## interview_age      -9.212e-05  2.781e-03  -0.033  0.9736
## MRI_minus_hormone_date_time    3.085e-06  2.842e-06   1.085  0.2779
## bmi                6.174e-03  5.653e-03   1.092  0.2749
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00279
## lmer.REML = 5005.2  Scale est. = 0.82111  n = 1869
```

## 2.15 Model: Putamen Feedback ~ Testosterone

### Females

```
## 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)      3.559e-01  3.399e-01   1.047  0.2952
## hormone_scr_ert_mean  1.859e-04  1.233e-03   0.151  0.8802
## hormone_sal_end_min_since_midnight -3.255e-04  1.212e-04  -2.686  0.0073 **
## interview_age      -1.146e-03  2.694e-03  -0.425  0.6705
## MRI_minus_hormone_date_time    3.695e-07  2.522e-06   0.146  0.8835
## bmi                1.078e-03  5.311e-03   0.203  0.8391
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00203
```

```
## lmer.REML = 4709.2  Scale est. = 0.70478  n = 1857
```

## Males

```
## 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)    3.934e-01  3.478e-01   1.131  0.2582
## hormone_scr_ert_mean -3.072e-03  1.459e-03  -2.105  0.0354 *
## hormone_sal_end_min_since_midnight -1.906e-04  1.275e-04  -1.494  0.1352
## interview_age    -2.616e-03  2.748e-03  -0.952  0.3411
## MRI_minus_hormone_date_time    1.875e-06  2.837e-06   0.661  0.5086
## bmi              9.808e-03  5.593e-03   1.754  0.0797 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00239
## lmer.REML = 4951.3  Scale est. = 0.75984  n = 1873
```

## 2.16 Model: Accumbens Feedback ~ Testosterone

### Females

```
## 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)   -3.594e-01  2.744e-01  -1.310   0.190
## hormone_scr_ert_mean -3.017e-04  9.935e-04  -0.304   0.761
## hormone_sal_end_min_since_midnight -8.185e-05  9.620e-05  -0.851   0.395
## interview_age     2.820e-03  2.174e-03   1.297   0.195
## MRI_minus_hormone_date_time    6.440e-07  2.024e-06   0.318   0.750
## bmi              4.567e-03  4.284e-03   1.066   0.286
##
##
## R-sq.(adj) = -0.000194
```



```
## lmer.REML = 3907.3  Scale est. = 0.43899  n = 1853
```

## Males

```
## 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)    3.366e-02  2.844e-01   0.118  0.9058
## hormone_scr_ert_mean -1.886e-03  1.199e-03  -1.572  0.1161
## hormone_sal_end_min_since_midnight -1.339e-04  1.037e-04  -1.291  0.1969
## interview_age    -1.331e-04  2.247e-03  -0.059  0.9528
## MRI_minus_hormone_date_time -2.074e-06  2.382e-06  -0.871  0.3838
## bmi              8.522e-03  4.611e-03   1.848  0.0647 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00226
## lmer.REML = 4197.4  Scale est. = 0.42826  n = 1875
```

## 2.17 Model: OFC Anticipation ~ Testosterone

### Females

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

##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvsnt_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)    1.633e-01  2.223e-01   0.734  0.4628
## hormone_scr_ert_mean 1.662e-03  8.039e-04   2.067  0.0389 *
## hormone_sal_end_min_since_midnight -7.882e-05  7.681e-05  -1.026  0.3049
## interview_age    -1.223e-03  1.762e-03  -0.695  0.4875
## MRI_minus_hormone_date_time -1.728e-06  1.636e-06  -1.056  0.2909
## bmi              -2.456e-04  3.464e-03  -0.071  0.9435
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## R-sq.(adj) = 0.00119
## lmer.REML = 3120.1 Scale est. = 0.3033 n = 1846

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

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvs_n_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)	3.424e-01	2.608e-01	1.313	0.189
hormone_scr_ert_mean	1.362e-03	9.417e-04	1.447	0.148
hormone_sal_end_min_since_midnight	-3.727e-05	9.118e-05	-0.409	0.683
interview_age	-2.918e-03	2.067e-03	-1.411	0.158
MRI_minus_hormone_date_time	5.643e-07	1.920e-06	0.294	0.769
bmi	-1.155e-03	4.058e-03	-0.285	0.776

```
##
##
## R-sq.(adj) = -0.000928
## lmer.REML = 3700 Scale est. = 0.41462 n = 1847
```

## Males

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

##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvs_n_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)	-4.562e-01	2.443e-01	-1.867	0.0621 .
hormone_scr_ert_mean	-1.374e-03	1.025e-03	-1.340	0.1803
hormone_sal_end_min_since_midnight	1.567e-04	8.723e-05	1.797	0.0725 .
interview_age	3.226e-03	1.932e-03	1.670	0.0951 .
MRI_minus_hormone_date_time	-1.584e-06	2.048e-06	-0.774	0.4393
bmi	-2.004e-03	3.942e-03	-0.508	0.6113

```
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00113
## lmer.REML = 3612.5 Scale est. = 0.34145 n = 1863
```

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

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvs_n_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)    -1.866e-01  2.772e-01  -0.673   0.501
## hormone_scr_ert_mean -2.384e-04  1.156e-03  -0.206   0.837
## hormone_sal_end_min_since_midnight  1.499e-04  9.549e-05   1.570   0.117
## interview_age      6.693e-04  2.190e-03   0.306   0.760
## MRI_minus_hormone_date_time -2.189e-06  2.298e-06  -0.952   0.341
## bmi              -1.079e-03  4.445e-03  -0.243   0.808
##
##
## R-sq.(adj) =  -0.000997
## lmer.REML = 4094.9  Scale est. = 0.4446    n = 1867
```

## 2.18 Model: OFC Feedback ~ Testosterone

### Females

```
## 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)      6.969e-02  1.983e-01   0.352   0.7252
## hormone_scr_ert_mean  1.333e-03  7.196e-04   1.853   0.0641
## hormone_sal_end_min_since_midnight -6.895e-05  6.801e-05  -1.014   0.3108
## interview_age      -8.187e-04  1.574e-03  -0.520   0.6031
## MRI_minus_hormone_date_time -2.228e-06  1.459e-06  -1.527   0.1269
## bmi                9.254e-04  3.094e-03   0.299   0.7649
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00207
## lmer.REML = 2726.7  Scale est. = 0.24409    n = 1853

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

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##   interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -8.624e-02  2.381e-01  -0.362   0.717
## hormone_scr_ert_mean    1.328e-03  8.637e-04   1.538   0.124
## hormone_sal_end_min_since_midnight  1.808e-05  8.028e-05   0.225   0.822
## interview_age    1.853e-04  1.889e-03   0.098   0.922
## MRI_minus_hormone_date_time   -1.567e-07  1.744e-06  -0.090   0.928
## bmi             -1.108e-03  3.718e-03  -0.298   0.766
##
##
## R-sq.(adj) =  -0.00132
## lmer.REML = 3423.2  Scale est. = 0.34969   n = 1857
```

## Males

```
## 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)    7.719e-03  2.127e-01   0.036   0.9711
## hormone_scr_ert_mean   -3.370e-04  8.878e-04  -0.380   0.7043
## hormone_sal_end_min_since_midnight -1.393e-04  7.369e-05  -1.890   0.0589 .
## interview_age    3.670e-04  1.680e-03   0.218   0.8271
## MRI_minus_hormone_date_time    2.690e-06  1.726e-06   1.558   0.1193
## bmi             3.374e-03  3.432e-03   0.983   0.3257
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000877
## lmer.REML = 3094.6  Scale est. = 0.23035   n = 1860
##
## Warning: Some predictor variables are on very different scales: consider
## rescaling
##
## Family: gaussian
## Link function: identity
##
```

```
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + hormone_sal_end_min_since_midnight +
##   interview_age + MRI_minus_hormone_date_time + bmi
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.129e-01  2.502e-01   0.451  0.6517
## hormone_scr_ert_mean      -9.530e-04  1.045e-03  -0.912  0.3620
## hormone_sal_end_min_since_midnight -1.757e-04  8.688e-05  -2.022  0.0433 *
## interview_age        2.348e-04  1.976e-03   0.119  0.9054
## MRI_minus_hormone_date_time      3.480e-07  2.086e-06   0.167  0.8675
## bmi                2.552e-03  4.037e-03   0.632  0.5273
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -5.3e-05
## lmer.REML = 3715.3  Scale est. = 0.3339    n = 1866
```

## 2.19 Model: MID Reaction Time ~ Testosterone

### Females

```
##
## 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)      -0.6132051  0.3603866  -1.702  0.0890 .
## hormone_scr_ert_mean      -0.0013159  0.0013225  -0.995  0.3199
## hormone_sal_end_min_since_midnight -0.0001012  0.0001186  -0.853  0.3937
## interview_age        0.0062619  0.0028566   2.192  0.0285 *
## bmi                0.0012710  0.0055094   0.231  0.8176
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00101
## lmer.REML = 5583.6  Scale est. = 0.7483    n = 2045
##
## 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) -6.100e-01 3.731e-01 -1.635 0.102
## hormone_scr_ert_mean -1.445e-03 1.371e-03 -1.055 0.292
## hormone_sal_end_min_since_midnight 2.733e-05 1.254e-04 0.218 0.827
## interview_age 4.389e-03 2.958e-03 1.484 0.138
## bmi 6.879e-03 5.696e-03 1.208 0.227
##
##
## R-sq.(adj) = 4.02e-05
## lmer.REML = 5712.8 Scale est. = 0.83368 n = 2045
```

## Males

```
##
## 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) -0.6568018 0.3348718 -1.961 0.0500 *
## hormone_scr_ert_mean -0.0012582 0.0014000 -0.899 0.3689
## hormone_sal_end_min_since_midnight 0.0001219 0.0001155 1.055 0.2915
## interview_age 0.0047592 0.0026664 1.785 0.0744 .
## bmi 0.0008703 0.0053883 0.162 0.8717
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.000265
## lmer.REML = 5779.5 Scale est. = 0.74258 n = 2142
##
## 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) -6.410e-02 3.304e-01 -0.194 0.846
## hormone_scr_ert_mean -1.537e-03 1.367e-03 -1.124 0.261
## hormone_sal_end_min_since_midnight 1.002e-05 1.104e-04 0.091 0.928
## interview_age 2.723e-04 2.631e-03 0.103 0.918
## bmi 2.876e-03 5.304e-03 0.542 0.588
##
##
## R-sq.(adj) = -0.00119
## lmer.REML = 5739.7 Scale est. = 0.83491 n = 2142
```

## 2.20 Model: BIS-BAS-RR ~ Testosterone

### Females

```
##
## 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)   -0.2622146  0.3514679  -0.746  0.455706
## hormone_scr_ert_mean -0.0002109  0.0012948  -0.163  0.870628
## hormone_sal_end_min_since_midnight  0.0004103  0.0001221   3.359  0.000793 ***
## interview_age   -0.0036387  0.0027803  -1.309  0.190754
## bmi             0.0180143  0.0053543   3.364  0.000779 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.0126
## lmer.REML = 6903.5  Scale est. = 0.79495    n = 2435
```

### Males

```
##
## 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)   -0.0754309  0.3160250  -0.239   0.8114
## hormone_scr_ert_mean -0.0025577  0.0013148  -1.945   0.0518 .
## hormone_sal_end_min_since_midnight  0.0001421  0.0001132   1.256   0.2091
## interview_age    0.0005400  0.0025207   0.214   0.8304
## bmi            0.0028675  0.0049928   0.574   0.5658
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.000107
## lmer.REML = 7430.8  Scale est. = 0.78582    n = 2673
```

### 3—Int~Reward—

#### 3.1 Model: CBCL internalizing factor ~ Nucleus Accumbens activity (anticipation stage)

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_rvsnt_ant_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.63582     2.02287  -0.314   0.7533
## accumbens_rvsnt_ant_z -0.27173     0.16789  -1.619   0.1057
## interview_age     0.03819     0.01589   2.404   0.0163 *
## race.ethnicity.5levelBlack  0.29624     0.78881   0.376   0.7073
## race.ethnicity.5levelMixed  1.17149     0.78961   1.484   0.1381
## race.ethnicity.5levelOther  0.39909     0.93625   0.426   0.6700
## race.ethnicity.5levelWhite  1.19862     0.72913   1.644   0.1004
## demo_race_hispanic1    0.10198     0.35925   0.284   0.7765
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0053
## lmer.REML = 12407  Scale est. = 15.495    n = 2010
```

##### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_rvsnt_ant_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     2.50616     2.16923   1.155   0.2481
## accumbens_rvsnt_ant_z  0.02060     0.16556   0.124   0.9010
## interview_age     0.01707     0.01616   1.056   0.2909
## race.ethnicity.5levelBlack  0.04518     0.99500   0.045   0.9638
## race.ethnicity.5levelMixed  0.64773     0.99180   0.653   0.5138
## race.ethnicity.5levelOther -0.70547     1.10712  -0.637   0.5241
## race.ethnicity.5levelWhite  0.26109     0.93234   0.280   0.7795
## demo_race_hispanic1    0.93574     0.37843   2.473   0.0135 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```



```
##
## R-sq.(adj) = 0.00207
## lmer.REML = 12573 Scale est. = 13.638 n = 2014
```

### 3.2 Model: CBCL internalizing factor ~ Caudate activity (anticipation stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_rvs_n_ant_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.397963   2.025610  -0.196   0.8443
## caudate_rvs_n_ant_z -0.006064   0.132425  -0.046   0.9635
## interview_age     0.035825   0.015916   2.251   0.0245 *
## race.ethnicity.5levelBlack 0.331027   0.790602   0.419   0.6755
## race.ethnicity.5levelMixed 1.219810   0.790694   1.543   0.1231
## race.ethnicity.5levelOther 0.460034   0.939225   0.490   0.6243
## race.ethnicity.5levelWhite 1.259727   0.730689   1.724   0.0849 .
## demo_race_hispanic1    0.096638   0.359320   0.269   0.7880
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) = 0.00367
## lmer.REML = 12446 Scale est. = 15.793 n = 2014
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_rvs_n_ant_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     2.44496   2.16996   1.127   0.25999
## caudate_rvs_n_ant_z 0.15635   0.13096   1.194   0.23265
## interview_age     0.01737   0.01615   1.075   0.28232
## race.ethnicity.5levelBlack 0.12790   0.99785   0.128   0.89802
## race.ethnicity.5levelMixed 0.72781   0.99470   0.732   0.46444
## race.ethnicity.5levelOther -0.76966   1.10931  -0.694   0.48788
## race.ethnicity.5levelWhite 0.31568   0.93620   0.337   0.73601
## demo_race_hispanic1    1.01845   0.38205   2.666   0.00774 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.00325
## lmer.REML = 12604 Scale est. = 12.689 n = 2018
```

### 3.3 Model: CBCL internalizing factor ~ Putamen activity (anticipation stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_rvsn_ant_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.57325     2.02419  -0.283  0.7771
## putamen_rvsn_ant_z -0.05862     0.13366  -0.439  0.6610
## interview_age     0.03731     0.01591   2.345  0.0191 *
## race.ethnicity.5levelBlack 0.32437     0.79065   0.410  0.6817
## race.ethnicity.5levelMixed 1.20223     0.79114   1.520  0.1288
## race.ethnicity.5levelOther 0.39471     0.93747   0.421  0.6738
## race.ethnicity.5levelWhite 1.26717     0.73072   1.734  0.0830 .
## demo_race_hispanic1     0.08629     0.35928   0.240  0.8102
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0041
## lmer.REML = 12445 Scale est. = 15.532 n = 2014
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_rvsn_ant_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     2.63538     2.17260   1.213  0.2253
## putamen_rvsn_ant_z -0.02636     0.13541  -0.195  0.8457
## interview_age     0.01590     0.01618   0.983  0.3259
## race.ethnicity.5levelBlack 0.05770     0.99758   0.058  0.9539
## race.ethnicity.5levelMixed 0.71410     0.99436   0.718  0.4727
## race.ethnicity.5levelOther -0.73964     1.11097  -0.666  0.5056
## race.ethnicity.5levelWhite 0.30112     0.93609   0.322  0.7477
## demo_race_hispanic1     0.97492     0.37889   2.573  0.0101 *
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00268
## lmer.REML = 12597  Scale est. = 12.749    n = 2017
```

### 3.4 Model: CBCL internalizing factor ~ Accumbens activity (feedback stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.85021    2.02908  -0.419   0.6753
## accumbens_posvsneg_feedback_z  0.22662    0.17303   1.310   0.1904
## interview_age   0.03746    0.01592   2.353   0.0187 *
## race.ethnicity.5levelBlack    0.61263    0.79658   0.769   0.4419
## race.ethnicity.5levelMixed    1.50028    0.79596   1.885   0.0596 .
## race.ethnicity.5levelOther    0.73026    0.93935   0.777   0.4370
## race.ethnicity.5levelWhite    1.51483    0.73613   2.058   0.0397 *
## demo_race_hispanic1    0.07632    0.36124   0.211   0.8327
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00504
## lmer.REML = 12407  Scale est. = 15.533    n = 2009
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.06132    2.18328   1.402   0.1610
## accumbens_posvsneg_feedback_z -0.22098    0.16751  -1.319   0.1873
## interview_age   0.01306    0.01624   0.804   0.4213
## race.ethnicity.5levelBlack   -0.02227    1.00962  -0.022   0.9824
## race.ethnicity.5levelMixed   0.67937    1.00620   0.675   0.4996
## race.ethnicity.5levelOther  -0.85671    1.11969  -0.765   0.4443
## race.ethnicity.5levelWhite   0.24756    0.94823   0.261   0.7941
## demo_race_hispanic1    0.95982    0.37858   2.535   0.0113 *
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00352
## lmer.REML = 12605  Scale est. = 13.512    n = 2017
```

### 3.5 Model: CBCL internalizing factor ~ Caudate activity (feedback stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.87180    2.02851  -0.430   0.6674
## caudate_posvsneg_feedback_z -0.02388    0.13579  -0.176   0.8604
## interview_age    0.03779    0.01591   2.374   0.0177 *
## race.ethnicity.5levelBlack  0.54766    0.79675   0.687   0.4919
## race.ethnicity.5levelMixed  1.44607    0.79595   1.817   0.0694 .
## race.ethnicity.5levelOther  0.66563    0.93920   0.709   0.4786
## race.ethnicity.5levelWhite  1.51365    0.73637   2.056   0.0400 *
## demo_race_hispanic1    0.13049    0.36011   0.362   0.7171
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00475
## lmer.REML = 12415  Scale est. = 15.565    n = 2010
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.12692    2.18176   1.433   0.1520
## caudate_posvsneg_feedback_z -0.10375    0.13642  -0.760   0.4471
## interview_age    0.01220    0.01626   0.750   0.4533
## race.ethnicity.5levelBlack  0.02769    0.99837   0.028   0.9779
## race.ethnicity.5levelMixed  0.69387    0.99419   0.698   0.4853
## race.ethnicity.5levelOther -0.83148    1.10900  -0.750   0.4535
## race.ethnicity.5levelWhite  0.25358    0.93637   0.271   0.7866
```

```
## demo_race_hispanic1          0.95500    0.37724    2.532    0.0114 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00258
## lmer.REML = 12571  Scale est. = 14.212    n = 2010
```

### 3.6 Model: CBCL internalizing factor ~ Putamen activity (feedback stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.46133    2.02633  -0.228   0.8199
## putamen_posvsneg_feedback_z -0.05774    0.13711  -0.421   0.6737
## interview_age    0.03631    0.01592   2.280   0.0227 *
## race.ethnicity.5levelBlack  0.30667    0.79070   0.388   0.6982
## race.ethnicity.5levelMixed  1.22111    0.79101   1.544   0.1228
## race.ethnicity.5levelOther  0.38953    0.93671   0.416   0.6776
## race.ethnicity.5levelWhite  1.26081    0.73015   1.727   0.0844 .
## demo_race_hispanic1    0.11865    0.36148   0.328   0.7428
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00434
## lmer.REML = 12420  Scale est. = 15.822    n = 2010
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   3.027e+00  2.181e+00   1.388   0.1653
## putamen_posvsneg_feedback_z  3.449e-05  1.374e-01   0.000   0.9998
## interview_age  1.291e-02  1.624e-02   0.795   0.4269
## race.ethnicity.5levelBlack  6.761e-02  9.993e-01   0.068   0.9461
## race.ethnicity.5levelMixed  7.251e-01  9.950e-01   0.729   0.4663
## race.ethnicity.5levelOther -7.980e-01  1.110e+00  -0.719   0.4722
```

```
## race.ethnicity.5levelWhite 2.849e-01 9.367e-01 0.304 0.7610
## demo_race_hispanic1 9.101e-01 3.780e-01 2.408 0.0162 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00206
## lmer.REML = 12606 Scale est. = 14.499 n = 2015
```

### 3.7 Model: CBCL internalizing factor ~ OFC activity (anticipation stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_rvsn_ant_z + interview_age + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.86822    2.03412  -0.427  0.6696
## lOFC_rvsn_ant_z -0.01292    0.20912  -0.062  0.9508
## interview_age    0.03767    0.01596   2.360  0.0184 *
## race.ethnicity.5levelBlack 0.60576    0.79837   0.759  0.4481
## race.ethnicity.5levelMixed 1.47630    0.79783   1.850  0.0644 .
## race.ethnicity.5levelOther 0.76513    0.94344   0.811  0.4175
## race.ethnicity.5levelWhite 1.51674    0.73763   2.056  0.0399 *
## demo_race_hispanic1 0.09209    0.36101   0.255  0.7987
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00402
## lmer.REML = 12363 Scale est. = 15.301 n = 2001

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_rvsn_ant_z + interview_age + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -1.03733    2.03567  -0.510  0.6104
## mOFC_rvsn_ant_z 0.18161    0.18035   1.007  0.3141
## interview_age   0.03893    0.01597   2.437  0.0149 *
## race.ethnicity.5levelBlack 0.61800    0.79748   0.775  0.4385
## race.ethnicity.5levelMixed 1.46932    0.79875   1.840  0.0660 .
## race.ethnicity.5levelOther 0.74866    0.94144   0.795  0.4266
## race.ethnicity.5levelWhite 1.54414    0.73776   2.093  0.0365 *
```

```
## demo_race_hispanic1      0.08501    0.36080    0.236    0.8138
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00489
## lmer.REML = 12368  Scale est. = 15.262    n = 2002
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_rvs_n_ant_z + interview_age + race.ethnicity.5level +
##    demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.29279    2.16369   1.060  0.2894
## lOFC_rvs_n_ant_z    -0.13550    0.19216  -0.705  0.4808
## interview_age       0.01904    0.01606   1.186  0.2360
## race.ethnicity.5levelBlack -0.10997    1.00241  -0.110  0.9127
## race.ethnicity.5levelMixed  0.69028    0.99775   0.692  0.4891
## race.ethnicity.5levelOther -0.82599    1.10749  -0.746  0.4559
## race.ethnicity.5levelWhite  0.23421    0.93934   0.249  0.8031
## demo_race_hispanic1    0.97588    0.37929   2.573  0.0102 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00314
## lmer.REML = 12469  Scale est. = 12.567    n = 2003
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_rvs_n_ant_z + interview_age + race.ethnicity.5level +
##    demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.18493    2.17314   1.005  0.315
## mOFC_rvs_n_ant_z   -0.15883    0.16765  -0.947  0.344
## interview_age       0.01988    0.01614   1.232  0.218
## race.ethnicity.5levelBlack  0.05775    1.00706   0.057  0.954
## race.ethnicity.5levelMixed  0.69071    1.00246   0.689  0.491
## race.ethnicity.5levelOther -0.79054    1.11409  -0.710  0.478
## race.ethnicity.5levelWhite  0.23193    0.94480   0.245  0.806
## demo_race_hispanic1    0.93454    0.38015   2.458  0.014 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.00269
## lmer.REML = 12534 Scale est. = 12.533 n = 2010
```

### 3.8 Model: CBCL internalizing factor ~ OFC activity (feedback stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_posvsneg_feedback_z + interview_age +
##     race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.63984    2.02223  -0.316   0.7517
## lOFC_posvsneg_feedback_z  0.02285    0.23223   0.098   0.9216
## interview_age   0.03776    0.01590   2.375   0.0176 *
## race.ethnicity.5levelBlack 0.39308    0.78874   0.498   0.6183
## race.ethnicity.5levelMixed 1.17361    0.78846   1.488   0.1368
## race.ethnicity.5levelOther 0.38523    0.93389   0.413   0.6800
## race.ethnicity.5levelWhite 1.24893    0.72802   1.716   0.0864 .
## demo_race_hispanic1      0.12395    0.36012   0.344   0.7307
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00351
## lmer.REML = 12407 Scale est. = 15.788 n = 2010
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_posvsneg_feedback_z + interview_age +
##     race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.96767    2.02412  -0.478   0.6327
## mOFC_posvsneg_feedback_z  0.28617    0.19681   1.454   0.1461
## interview_age   0.03816    0.01588   2.403   0.0163 *
## race.ethnicity.5levelBlack 0.68305    0.79645   0.858   0.3912
## race.ethnicity.5levelMixed 1.53987    0.79531   1.936   0.0530 .
## race.ethnicity.5levelOther 0.66745    0.93948   0.710   0.4775
## race.ethnicity.5levelWhite 1.54852    0.73601   2.104   0.0355 *
## demo_race_hispanic1      0.09935    0.36026   0.276   0.7827
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```



```
##
## R-sq.(adj) = 0.00547
## lmer.REML = 12435 Scale est. = 15.59 n = 2014

Males

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_posvsneg_feedback_z + interview_age +
## race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.87055     2.17887   1.317   0.1878
## lOFC_posvsneg_feedback_z  0.17988     0.22534   0.798   0.4248
## interview_age      0.01451     0.01621   0.895   0.3707
## race.ethnicity.5levelBlack -0.03104     1.00762  -0.031   0.9754
## race.ethnicity.5levelMixed  0.66698     1.00338   0.665   0.5063
## race.ethnicity.5levelOther -0.86137     1.11476  -0.773   0.4398
## race.ethnicity.5levelWhite  0.25512     0.94393   0.270   0.7870
## demo_race_hispanic1    0.96068     0.38039   2.525   0.0116 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0027
## lmer.REML = 12499 Scale est. = 13.601 n = 2003

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_posvsneg_feedback_z + interview_age +
## race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.80356     2.17159   1.291   0.197
## mOFC_posvsneg_feedback_z  0.06810     0.18813   0.362   0.717
## interview_age      0.01505     0.01615   0.932   0.351
## race.ethnicity.5levelBlack -0.05313     1.00545  -0.053   0.958
## race.ethnicity.5levelMixed  0.70071     1.00083   0.700   0.484
## race.ethnicity.5levelOther -0.83480     1.11175  -0.751   0.453
## race.ethnicity.5levelWhite  0.25642     0.94229   0.272   0.786
## demo_race_hispanic1    0.94940     0.37740   2.516   0.012 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00278
## lmer.REML = 12550 Scale est. = 13.64 n = 2012
```

### 3.9 Model: CBCL internalizing factor ~ BIS-BAS-RR

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ bisbas_ss_basm_rr + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.28402    1.84169  -0.154   0.8774
## bisbas_ss_basm_rr -0.01772    0.04412  -0.402   0.6879
## interview_age     0.03766    0.01412   2.667   0.0077 **
## race.ethnicity.5levelBlack  0.25551    0.71510   0.357   0.7209
## race.ethnicity.5levelMixed  1.34417    0.72065   1.865   0.0623 .
## race.ethnicity.5levelOther  0.40110    0.83194   0.482   0.6298
## race.ethnicity.5levelWhite  1.03255    0.66784   1.546   0.1222
## demo_race_hispanic1    0.26718    0.32301   0.827   0.4082
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00385
## lmer.REML = 16155 Scale est. = 17.08      n = 2613
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ bisbas_ss_basm_rr + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     3.224382    1.881622   1.714   0.0867 .
## bisbas_ss_basm_rr -0.062272    0.044778  -1.391   0.1644
## interview_age     0.019325    0.013946   1.386   0.1659
## race.ethnicity.5levelBlack -0.516753    0.785041  -0.658   0.5104
## race.ethnicity.5levelMixed  0.500363    0.785415   0.637   0.5241
## race.ethnicity.5levelOther -0.777057    0.884180  -0.879   0.3796
## race.ethnicity.5levelWhite -0.001334    0.734923  -0.002   0.9986
## demo_race_hispanic1    0.627179    0.324501   1.933   0.0534 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00177
## lmer.REML = 17700 Scale est. = 15.925      n = 2830
```

### 3.10 Model: CBCL internalizing factor ~ MID Reaction Time

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_neutral_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.76469    1.96215  -0.390  0.69678
## rt_diff_large_neutral_z    0.08900    0.12273   0.725  0.46845
## interview_age     0.04063    0.01548   2.625  0.00873 **
## race.ethnicity.5levelBlack  0.19161    0.76490   0.251  0.80222
## race.ethnicity.5levelMixed  1.00178    0.76537   1.309  0.19071
## race.ethnicity.5levelOther  0.39482    0.88392   0.447  0.65516
## race.ethnicity.5levelWhite  0.99430    0.70794   1.404  0.16032
## demo_race_hispanic1      0.25243    0.34970   0.722  0.47047
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00363
## lmer.REML = 13477 Scale est. = 16.697    n = 2179

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_small_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.77702    1.95961  -0.397  0.6918
## rt_diff_large_small_z    0.14688    0.11773   1.248  0.2123
## interview_age     0.04055    0.01547   2.622  0.0088 **
## race.ethnicity.5levelBlack  0.22132    0.76478   0.289  0.7723
## race.ethnicity.5levelMixed  1.03140    0.76538   1.348  0.1779
## race.ethnicity.5levelOther  0.42040    0.88362   0.476  0.6343
## race.ethnicity.5levelWhite  1.02009    0.70762   1.442  0.1496
## demo_race_hispanic1      0.24694    0.34946   0.707  0.4799
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0041
## lmer.REML = 13476 Scale est. = 16.677    n = 2179
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_neutral_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.97192    2.06219   1.441   0.1497
## rt_diff_large_neutral_z -0.07996    0.12321  -0.649   0.5164
## interview_age      0.01937    0.01530   1.266   0.2056
## race.ethnicity.5levelBlack -0.71967    0.93831  -0.767   0.4432
## race.ethnicity.5levelMixed -0.09994    0.93920  -0.106   0.9153
## race.ethnicity.5levelOther -1.27883    1.03906  -1.231   0.2185
## race.ethnicity.5levelWhite -0.40678    0.88195  -0.461   0.6447
## demo_race_hispanic1      0.74914    0.35964   2.083   0.0374 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.00064
## lmer.REML = 14119 Scale est. = 12.38      n = 2262
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_small_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.99074    2.05972   1.452   0.1466
## rt_diff_large_small_z -0.16662    0.12411  -1.343   0.1795
## interview_age      0.01908    0.01528   1.249   0.2119
## race.ethnicity.5levelBlack -0.68411    0.93842  -0.729   0.4661
## race.ethnicity.5levelMixed -0.08892    0.93882  -0.095   0.9245
## race.ethnicity.5levelOther -1.27577    1.03877  -1.228   0.2195
## race.ethnicity.5levelWhite -0.39841    0.88173  -0.452   0.6514
## demo_race_hispanic1      0.76807    0.35969   2.135   0.0328 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.000124
## lmer.REML = 14118 Scale est. = 12.336      n = 2262
```

## 4—Int~Puberty x Reward—

### 4.1 Model: CBCL internalizing factor ~ PDS x Accumbens activity (anticipation stage)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * accumbens_rvsnt_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age +
##   bmi + household.income + high.educ
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.19987    2.43939   0.082  0.9347
## PDS_score         0.79254    0.19269   4.113 4.08e-05 ***
## accumbens_rvsnt_z -0.11644    0.43011  -0.271  0.7866
## race.ethnicity.5levelBlack -0.54696    0.88663  -0.617  0.5374
## race.ethnicity.5levelMixed  1.03544    0.85146   1.216  0.2241
## race.ethnicity.5levelOther -0.16088    1.02269  -0.157  0.8750
## race.ethnicity.5levelWhite  1.45279    0.79104   1.837  0.0664 .
## demo_race_hispanic1 -0.20403    0.38852  -0.525  0.5995
## interview_age      0.02278    0.01742   1.307  0.1912
## bmi                0.02269    0.03487   0.651  0.5153
## household.income[>=200K] -1.88984    0.97221  -1.944  0.0521 .
## household.income[100K-200K] -0.89020    0.90918  -0.979  0.3277
## household.income[12K-16K]   0.25208    1.12725   0.224  0.8231
## household.income[16K-25K] -1.10913    1.03345  -1.073  0.2833
## household.income[25K-35K]   0.78057    0.95360   0.819  0.4131
## household.income[35K-50K] -0.41598    0.92982  -0.447  0.6547
## household.income[50K-75K] -0.73265    0.91346  -0.802  0.4226
## household.income[5K-12K]    0.55629    1.06287   0.523  0.6008
## household.income[75K-100K] -0.62387    0.92037  -0.678  0.4980
## high.educBachelor  -0.31054    0.84267  -0.369  0.7125
## high.educHS Diploma/GED -0.49667    0.85388  -0.582  0.5609
## high.educPost Graduate Degree 0.06275    0.85607   0.073  0.9416
## high.educSome College  0.36018    0.79327   0.454  0.6498
## PDS_score:accumbens_rvsnt_z -0.10649    0.23252  -0.458  0.6470
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0285
## lmer.REML = 11325 Scale est. = 15.622    n = 1846
```

#### Males

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

```

## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * accumbens_rvsnt_z +
##     race.ethnicity.5level + demo_race_hispanic + interview_age +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.668835    2.556890   1.044 0.296725
## PDS_score         0.746048    0.263507   2.831 0.004688 **
## accumbens_rvsnt_z  0.364988    0.435625   0.838 0.402226
## race.ethnicity.5levelBlack -0.108348    1.079384  -0.100 0.920054
## race.ethnicity.5levelMixed  1.304836    1.051483   1.241 0.214784
## race.ethnicity.5levelOther  0.341785    1.189402   0.287 0.773870
## race.ethnicity.5levelWhite  1.206927    0.989496   1.220 0.222722
## demo_race_hispanic1  0.311388    0.408385   0.762 0.445868
## interview_age      0.012166    0.016968   0.717 0.473475
## bmi               0.012529    0.036822   0.340 0.733708
## household.income[>=200K] -3.281213    0.990068  -3.314 0.000937 ***
## household.income[100K-200K] -2.763515    0.933363  -2.961 0.003108 **
## household.income[12K-16K]  -1.157768    1.199683  -0.965 0.334642
## household.income[16K-25K]  -0.008963    1.030309  -0.009 0.993060
## household.income[25K-35K]  -0.663347    1.015310  -0.653 0.513617
## household.income[35K-50K]  -0.669759    0.974374  -0.687 0.491934
## household.income[50K-75K]  -2.274735    0.934490  -2.434 0.015020 *
## household.income[5K-12K]    0.169541    1.099597   0.154 0.877481
## household.income[75K-100K] -2.905544    0.949416  -3.060 0.002243 **
## high.educBachelor    1.452597    0.960481   1.512 0.130615
## high.educHS Diploma/GED -0.979665    0.985423  -0.994 0.320278
## high.educPost Graduate Degree  0.582158    0.960077   0.606 0.544347
## high.educSome College   0.869921    0.917613   0.948 0.343241
## PDS_score:accumbens_rvsnt_z -0.260139    0.292297  -0.890 0.373593
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0392
## lmer.REML = 11466 Scale est. = 13.619    n = 1849

```

## 4.2 Model: CBCL internalizing factor ~ PDS x Caudate activity (anticipation stage)

### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * caudate_rvsnt_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + bmi + household.income +
##     high.educ
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)

```

```

## (Intercept)                0.52927    2.43361    0.217    0.8279
## PDS_score                   0.76803    0.19272    3.985 7.01e-05 ***
## caudate_rvsnt_ant_z        0.77370    0.34515    2.242    0.0251 *
## race.ethnicity.5levelBlack -0.51173    0.88814   -0.576    0.5646
## race.ethnicity.5levelMixed  1.07930    0.85226    1.266    0.2055
## race.ethnicity.5levelOther -0.07330    1.02515   -0.072    0.9430
## race.ethnicity.5levelWhite  1.52492    0.79237    1.925    0.0544 .
## demo_race_hispanic1       -0.22051    0.38852   -0.568    0.5704
## interview_age              0.02131    0.01742    1.223    0.2213
## bmi                        0.03008    0.03466    0.868    0.3856
## household.income[>=200K]   -2.21288    0.96642   -2.290    0.0221 *
## household.income[100K-200K] -1.20284    0.90240   -1.333    0.1827
## household.income[12K-16K]   0.06126    1.12824    0.054    0.9567
## household.income[16K-25K]   -1.36902    1.02749   -1.332    0.1829
## household.income[25K-35K]    0.43839    0.94424    0.464    0.6425
## household.income[35K-50K]   -0.68580    0.92095   -0.745    0.4566
## household.income[50K-75K]   -1.01690    0.90543   -1.123    0.2615
## household.income[5K-12K]     0.23352    1.05848    0.221    0.8254
## household.income[75K-100K]  -0.92123    0.91378   -1.008    0.3135
## high.educBachelor          -0.33766    0.83936   -0.402    0.6875
## high.educHS Diploma/GED    -0.49618    0.85416   -0.581    0.5614
## high.educPost Graduate Degree 0.09642    0.85272    0.113    0.9100
## high.educSome College       0.30288    0.79132    0.383    0.7019
## PDS_score:caudate_rvsnt_ant_z -0.44649    0.19155   -2.331    0.0199 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0296
## lmer.REML = 11351 Scale est. = 16.23    n = 1848

```

## Males

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * caudate_rvsnt_ant_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age + bmi + household.income +
##   high.educ
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.27460    2.54857    0.892  0.37224
## PDS_score       0.72826    0.26505    2.748  0.00606 **
## caudate_rvsnt_ant_z -0.03750    0.37583   -0.100  0.92053
## race.ethnicity.5levelBlack -0.01279    1.07966   -0.012  0.99055
## race.ethnicity.5levelMixed  1.39123    1.05392    1.320  0.18698
## race.ethnicity.5levelOther  0.29446    1.19153    0.247  0.80484
## race.ethnicity.5levelWhite  1.24808    0.99269    1.257  0.20882
## demo_race_hispanic1  0.40834    0.41147    0.992  0.32113
## interview_age     0.01274    0.01697    0.751  0.45300
## bmi              0.02021    0.03694    0.547  0.58443

```

```

## household.income[>=200K]      -3.19440    0.98176   -3.254   0.00116 **
## household.income[100K-200K]    -2.61789    0.92382   -2.834   0.00465 **
## household.income[12K-16K]      -0.77745    1.19679   -0.650   0.51602
## household.income[16K-25K]       0.15487    1.01804    0.152   0.87910
## household.income[25K-35K]      -0.47781    1.00891   -0.474   0.63585
## household.income[35K-50K]      -0.50031    0.96604   -0.518   0.60459
## household.income[50K-75K]      -2.01226    0.92431   -2.177   0.02960 *
## household.income[5K-12K]        0.43778    1.09645    0.399   0.68974
## household.income[75K-100K]     -2.72820    0.93954   -2.904   0.00373 **
## high.educBachelor               1.47711    0.94599    1.561   0.11859
## high.educHS Diploma/GED        -1.10801    0.96856   -1.144   0.25278
## high.educPost Graduate Degree   0.63666    0.94617    0.673   0.50111
## high.educSome College           0.87567    0.90374    0.969   0.33270
## PDS_score:caudate_rvs_n_ant_z   0.12919    0.26079    0.495   0.62041
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0398
## lmer.REML = 11493  Scale est. = 12.653    n = 1853

```

### 4.3 Model: CBCL internalizing factor ~ PDS x Putamen activity (anticipation stage)

#### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * putamen_rvs_n_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age + bmi + household.income +
##      high.educ
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.18199    2.43846   0.075   0.9405
## PDS_score       0.77946    0.19301   4.038 5.6e-05 ***
## putamen_rvs_n_ant_z 0.51684    0.35098   1.473   0.1410
## race.ethnicity.5levelBlack -0.51921    0.88894  -0.584   0.5592
## race.ethnicity.5levelMixed  1.06269    0.85367   1.245   0.2133
## race.ethnicity.5levelOther -0.12951    1.02499  -0.126   0.8995
## race.ethnicity.5levelWhite  1.51865    0.79338   1.914   0.0558 .
## demo_race_hispanic1 -0.20874    0.38909  -0.536   0.5917
## interview_age     0.02186    0.01743   1.254   0.2100
## bmi              0.02891    0.03490   0.828   0.4075
## household.income[>=200K]    -1.97204    0.97578  -2.021   0.0434 *
## household.income[100K-200K] -0.96416    0.91232  -1.057   0.2907
## household.income[12K-16K]   0.22577    1.13244   0.199   0.8420
## household.income[16K-25K]   -1.09675    1.03876  -1.056   0.2912
## household.income[25K-35K]   0.67425    0.95488   0.706   0.4802
## household.income[35K-50K]   -0.43173    0.93241  -0.463   0.6434
## household.income[50K-75K]   -0.79323    0.91494  -0.867   0.3861

```



```
## household.income[5K-12K]      0.49588    1.06790    0.464    0.6425
## household.income[75K-100K]   -0.69572    0.92325   -0.754    0.4512
## high.educBachelor           -0.26109    0.83684   -0.312    0.7551
## high.educHS Diploma/GED     -0.46064    0.85090   -0.541    0.5883
## high.educPost Graduate Degree 0.15474    0.85033    0.182    0.8556
## high.educSome College        0.38669    0.78792    0.491    0.6236
## PDS_score:putamen_rvs_n_ant_z -0.27967    0.19194   -1.457    0.1453
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0276
## lmer.REML = 11353  Scale est. = 15.813    n = 1848
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * putamen_rvs_n_ant_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age + bmi + household.income +
##   high.educ
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.4927082   2.5555208    0.975  0.32948
## PDS_score       0.7756950   0.2663093    2.913  0.00363 **
## putamen_rvs_n_ant_z 0.2834519   0.3949329    0.718  0.47302
## race.ethnicity.5levelBlack 0.0001431   1.0817292    0.000  0.99989
## race.ethnicity.5levelMixed 1.3575455   1.0555089    1.286  0.19855
## race.ethnicity.5levelOther 0.3273285   1.1935135    0.274  0.78392
## race.ethnicity.5levelWhite 1.2081930   0.9944948    1.215  0.22457
## demo_race_hispanic1 0.3881799   0.4104266    0.946  0.34438
## interview_age    0.0099168   0.0170198    0.583  0.56019
## bmi              0.0177485   0.0370427    0.479  0.63190
## household.income[>=200K] -3.1208895   0.9831975   -3.174  0.00153 **
## household.income[100K-200K] -2.5910582   0.9250107   -2.801  0.00515 **
## household.income[12K-16K]  -0.8692761   1.1932014   -0.729  0.46639
## household.income[16K-25K]   0.1353133   1.0176884    0.133  0.89424
## household.income[25K-35K]  -0.5001195   1.0088742   -0.496  0.62015
## household.income[35K-50K]  -0.4669172   0.9685290   -0.482  0.62980
## household.income[50K-75K]  -1.9923143   0.9253626   -2.153  0.03145 *
## household.income[5K-12K]    0.2134903   1.0892411    0.196  0.84463
## household.income[75K-100K] -2.6453000   0.9412716   -2.810  0.00500 **
## high.educBachelor    1.5888184   0.9403096    1.690  0.09126 .
## high.educHS Diploma/GED -1.0540087   0.9636757   -1.094  0.27421
## high.educPost Graduate Degree 0.7441161   0.9410583    0.791  0.42921
## high.educSome College    0.9790706   0.8968195    1.092  0.27510
## PDS_score:putamen_rvs_n_ant_z -0.2187160   0.2737571   -0.799  0.42443
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## R-sq.(adj) = 0.038
## lmer.REML = 11499 Scale est. = 12.667 n = 1853
```

#### 4.4 Model: CBCL internalizing factor ~ PDS x Lateral OFC activity (anticipation stage)

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * lOFC_rvs_n_ant_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age + bmi + household.income +
##   high.educ
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.509631   2.453955   0.208 0.835504
## PDS_score       0.743493   0.195361   3.806 0.000146 ***
## lOFC_rvs_n_ant_z 0.371556   0.520662   0.714 0.475553
## race.ethnicity.5levelBlack -0.509222   0.893439  -0.570 0.568777
## race.ethnicity.5levelMixed  1.085426   0.856802   1.267 0.205377
## race.ethnicity.5levelOther -0.008328   1.028092  -0.008 0.993538
## race.ethnicity.5levelWhite  1.520267   0.795904   1.910 0.056276 .
## demo_race_hispanic1 -0.229686   0.391675  -0.586 0.557666
## interview_age    0.022207   0.017531   1.267 0.205428
## bmi             0.033037   0.034909   0.946 0.344094
## household.income[>=200K] -2.349377   0.982168  -2.392 0.016857 *
## household.income[100K-200K] -1.351875   0.918676  -1.472 0.141317
## household.income[12K-16K] -0.067052   1.139912  -0.059 0.953100
## household.income[16K-25K] -1.511751   1.041776  -1.451 0.146917
## household.income[25K-35K]  0.280808   0.961148   0.292 0.770199
## household.income[35K-50K] -0.795571   0.938319  -0.848 0.396623
## household.income[50K-75K] -1.151035   0.920871  -1.250 0.211482
## household.income[5K-12K]  0.107912   1.079860   0.100 0.920410
## household.income[75K-100K] -1.073761   0.929025  -1.156 0.247918
## high.educBachelor -0.285637   0.862130  -0.331 0.740444
## high.educHS Diploma/GED -0.471556   0.874502  -0.539 0.589796
## high.educPost Graduate Degree 0.157297   0.875476   0.180 0.857431
## high.educSome College  0.349323   0.812297   0.430 0.667215
## PDS_score:lOFC_rvs_n_ant_z -0.164213   0.289256  -0.568 0.570304
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0252
## lmer.REML = 11292 Scale est. = 15.515 n = 1837
```

##### Males

```
##
## Family: gaussian
```

```

## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * lOFC_rvs_n_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age + bmi + household.income +
##      high.educ
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.8899551   2.5602585    0.738  0.46049
## PDS_score       0.6690788   0.2661542    2.514  0.01203 *
## lOFC_rvs_n_ant_z -0.1563665   0.5432191   -0.288  0.77349
## race.ethnicity.5levelBlack -0.1031758   1.0924920   -0.094  0.92477
## race.ethnicity.5levelMixed  1.3818086   1.0629140    1.300  0.19376
## race.ethnicity.5levelOther  0.3270420   1.1967393    0.273  0.78467
## race.ethnicity.5levelWhite  1.2388365   1.0015380    1.237  0.21627
## demo_race_hispanic1    0.3626372   0.4101091    0.884  0.37668
## interview_age      0.0142816   0.0169079    0.845  0.39841
## bmi               0.0152630   0.0366726    0.416  0.67732
## household.income[>=200K] -2.7069049   1.0039019   -2.696  0.00707 **
## household.income[100K-200K] -2.2091889   0.9485947   -2.329  0.01997 *
## household.income[12K-16K] -0.5989285   1.2158175   -0.493  0.62235
## household.income[16K-25K]  0.6471284   1.0438504    0.620  0.53537
## household.income[25K-35K] -0.1385306   1.0284002   -0.135  0.89286
## household.income[35K-50K] -0.0729630   0.9874297   -0.074  0.94110
## household.income[50K-75K] -1.7069097   0.9505327   -1.796  0.07270 .
## household.income[5K-12K]  0.4555305   1.1168450    0.408  0.68342
## household.income[75K-100K] -2.3291007   0.9632424   -2.418  0.01570 *
## high.educBachelor    1.4563833   0.9368369    1.555  0.12022
## high.educHS Diploma/GED -0.9280029   0.9719115   -0.955  0.33979
## high.educPost Graduate Degree 0.5937916   0.9364935    0.634  0.52612
## high.educSome College  0.8353600   0.8954363    0.933  0.35099
## PDS_score:lOFC_rvs_n_ant_z -0.0006906   0.3724398   -0.002  0.99852
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0373
## lmer.REML = 11383 Scale est. = 12.556    n = 1840

```

#### 4.5 Model: CBCL internalizing factor ~ PDS x Medial OFC activity (anticipation stage)

##### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * mOFC_rvs_n_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age + bmi + household.income +
##      high.educ
##

```

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.23125    2.44798   0.094 0.924750
## PDS_score         0.74166    0.19569   3.790 0.000156 ***
## mOFC_rvsnt_ant_z  0.68269    0.45307   1.507 0.132039
## race.ethnicity.5levelBlack -0.49374    0.89222  -0.553 0.580068
## race.ethnicity.5levelMixed  1.06878    0.85750   1.246 0.212780
## race.ethnicity.5levelOther  0.01560    1.02588   0.015 0.987869
## race.ethnicity.5levelWhite  1.57030    0.79556   1.974 0.048552 *
## demo_race_hispanic1 -0.25419    0.39118  -0.650 0.515899
## interview_age      0.02340    0.01750   1.337 0.181485
## bmi               0.03649    0.03489   1.046 0.295773
## household.income[>=200K] -2.46751    0.98037  -2.517 0.011924 *
## household.income[100K-200K] -1.41492    0.91672  -1.543 0.122894
## household.income[12K-16K]  -0.22244    1.13312  -0.196 0.844391
## household.income[16K-25K]  -1.54100    1.04031  -1.481 0.138706
## household.income[25K-35K]   0.26413    0.95711   0.276 0.782602
## household.income[35K-50K]  -0.87687    0.93651  -0.936 0.349235
## household.income[50K-75K]  -1.21896    0.91802  -1.328 0.184408
## household.income[5K-12K]    0.04002    1.07524   0.037 0.970316
## household.income[75K-100K] -1.14780    0.92676  -1.239 0.215686
## high.educBachelor  -0.15461    0.85496  -0.181 0.856513
## high.educHS Diploma/GED  -0.37719    0.86561  -0.436 0.663068
## high.educPost Graduate Degree 0.27185    0.86905   0.313 0.754462
## high.educSome College  0.45474    0.80486   0.565 0.572148
## PDS_score:mOFC_rvsnt_ant_z -0.23269    0.24885  -0.935 0.349888
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.028
## lmer.REML = 11289 Scale est. = 15.582 n = 1837
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * mOFC_rvsnt_ant_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age + bmi + household.income +
##   high.educ
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.33465    2.56104   0.912 0.36210
## PDS_score         0.74586    0.26566   2.808 0.00504 **
## mOFC_rvsnt_ant_z  0.59577    0.44424   1.341 0.18006
## race.ethnicity.5levelBlack -0.05633    1.09594  -0.051 0.95902
## race.ethnicity.5levelMixed  1.26999    1.06560   1.192 0.23349
## race.ethnicity.5levelOther  0.33258    1.20125   0.277 0.78192
## race.ethnicity.5levelWhite  1.18947    1.00496   1.184 0.23673
## demo_race_hispanic1  0.35212    0.40931   0.860 0.38975
```

```
## interview_age          0.01453    0.01694    0.857    0.39136
## bmi                    0.01654    0.03667    0.451    0.65197
## household.income[>=200K] -3.25982    0.99489   -3.277    0.00107 **
## household.income[100K-200K] -2.79664    0.93840   -2.980    0.00292 **
## household.income[12K-16K]  -1.24341    1.19243   -1.043    0.29720
## household.income[16K-25K]  -0.06731    1.03063   -0.065    0.94794
## household.income[25K-35K]  -0.84096    1.01997   -0.824    0.40977
## household.income[35K-50K]  -0.62621    0.97777   -0.640    0.52197
## household.income[50K-75K]  -2.27169    0.93946   -2.418    0.01570 *
## household.income[5K-12K]   -0.13244    1.10869   -0.119    0.90492
## household.income[75K-100K] -2.86625    0.95358   -3.006    0.00269 **
## high.educBachelor         1.45219    0.93867    1.547    0.12202
## high.educHS Diploma/GED   -1.10692    0.96878   -1.143    0.25336
## high.educPost Graduate Degree 0.63563    0.93823    0.677    0.49819
## high.educSome College      0.89430    0.89508    0.999    0.31786
## PDS_score:m0FC_rvs_n_ant_z -0.61615    0.30883   -1.995    0.04618 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0408
## lmer.REML = 11447  Scale est. = 12.563    n = 1848
```

#### 4.6 Model: CBCL internalizing factor ~ PDS x Accumbens activity (feedback)

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * accumbens_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age +
##   bmi + household.income + high.educ
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   0.35307    2.43986    0.145    0.8850
## PDS_score                      0.76492    0.19403    3.942 8.37e-05
## accumbens_posvsneg_feedback_z  0.10595    0.44779    0.237    0.8130
## race.ethnicity.5levelBlack     -0.48032    0.89176   -0.539    0.5902
## race.ethnicity.5levelMixed      1.10492    0.85548    1.292    0.1967
## race.ethnicity.5levelOther     -0.05763    1.02403   -0.056    0.9551
## race.ethnicity.5levelWhite      1.51240    0.79409    1.905    0.0570
## demo_race_hispanic1            -0.23063    0.39229   -0.588    0.5567
## interview_age                   0.02054    0.01746    1.176    0.2398
## bmi                           0.03083    0.03480    0.886    0.3758
## household.income[>=200K]       -1.97151    0.97565   -2.021    0.0435
## household.income[100K-200K]    -0.93035    0.91144   -1.021    0.3075
## household.income[12K-16K]       0.23620    1.13195    0.209    0.8347
## household.income[16K-25K]      -1.17570    1.03619   -1.135    0.2567
## household.income[25K-35K]       0.67948    0.95356    0.713    0.4762
## household.income[35K-50K]      -0.44467    0.93169   -0.477    0.6332
## household.income[50K-75K]      -0.77898    0.91599   -0.850    0.3952
```

```

## household.income[5K-12K]          0.38165    1.07169    0.356    0.7218
## household.income[75K-100K]        -0.67134    0.92331   -0.727    0.4673
## high.educBachelor                 -0.30408    0.84731   -0.359    0.7197
## high.educHS Diploma/GED          -0.47572    0.85865   -0.554    0.5796
## high.educPost Graduate Degree      0.10898    0.86114    0.127    0.8993
## high.educSome College              0.34659    0.79736    0.435    0.6639
## PDS_score:accumbens_posvsneg_feedback_z 0.05945    0.24407    0.244    0.8076
##
## (Intercept)
## PDS_score                        ***
## accumbens_posvsneg_feedback_z
## 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
## PDS_score:accumbens_posvsneg_feedback_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0257
## lmer.REML = 11341  Scale est. = 15.659    n = 1846

```

## Males

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * accumbens_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age +
##   bmi + household.income + high.educ
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                  2.833606   2.573055   1.101 0.270928
## PDS_score                     0.732031   0.264249   2.770 0.005658

```

```

## accumbens_posvsneg_feedback_z      0.498652    0.501856    0.994 0.320541
## race.ethnicity.5levelBlack          -0.157031    1.091012   -0.144 0.885570
## race.ethnicity.5levelMixed           1.371431    1.065187    1.288 0.198082
## race.ethnicity.5levelOther           0.311895    1.200040    0.260 0.794967
## race.ethnicity.5levelWhite           1.295424    1.005717    1.288 0.197888
## demo_race_hispanic1                 0.369736    0.407321    0.908 0.364143
## interview_age                       0.008032    0.017001    0.472 0.636670
## bmi                                 0.038021    0.036993    1.028 0.304191
## household.income[>=200K]            -3.510564    0.999903   -3.511 0.000457
## household.income[100K-200K]         -3.078528    0.942808   -3.265 0.001114
## household.income[12K-16K]           -1.275245    1.195551   -1.067 0.286267
## household.income[16K-25K]           -0.345507    1.032720   -0.335 0.737996
## household.income[25K-35K]           -0.819645    1.028399   -0.797 0.425548
## household.income[35K-50K]           -0.990200    0.983894   -1.006 0.314352
## household.income[50K-75K]           -2.446963    0.944296   -2.591 0.009637
## household.income[5K-12K]            -0.092983    1.118555   -0.083 0.933759
## household.income[75K-100K]          -3.135884    0.959249   -3.269 0.001099
## high.educBachelor                   1.566462    0.944650    1.658 0.097440
## high.educHS Diploma/GED            -1.105470    0.969749   -1.140 0.254455
## high.educPost Graduate Degree        0.726847    0.944857    0.769 0.441834
## high.educSome College                0.979738    0.901637    1.087 0.277347
## PDS_score:accumbens_posvsneg_feedback_z -0.590649    0.363764   -1.624 0.104610
##
## (Intercept)
## PDS_score                          **
## accumbens_posvsneg_feedback_z
## 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
## PDS_score:accumbens_posvsneg_feedback_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0421
## lmer.REML = 11479  Scale est. = 13.482    n = 1851

```

## 4.7 Model: CBCL internalizing factor ~ PDS x Caudate activity (feedback)

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * caudate_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age +
##   bmi + household.income + high.educ
##
## Parametric coefficients:
##
```

	Estimate	Std. Error	t value	Pr(> t )	
## (Intercept)	0.51190	2.42883	0.211	0.8331	
## PDS_score	0.76428	0.19286	3.963	7.69e-05	***
## caudate_posvsneg_feedback_z	-0.71105	0.35018	-2.031	0.0424	*
## race.ethnicity.5levelBlack	-0.60318	0.89066	-0.677	0.4983	
## race.ethnicity.5levelMixed	1.00450	0.85426	1.176	0.2398	
## race.ethnicity.5levelOther	-0.17787	1.02347	-0.174	0.8620	
## race.ethnicity.5levelWhite	1.49748	0.79346	1.887	0.0593	.
## demo_race_hispanic1	-0.17104	0.38968	-0.439	0.6608	
## interview_age	0.02055	0.01739	1.181	0.2377	
## bmi	0.03194	0.03473	0.920	0.3579	
## household.income[>=200K]	-2.17768	0.96850	-2.249	0.0247	*
## household.income[100K-200K]	-1.20550	0.90382	-1.334	0.1824	
## household.income[12K-16K]	-0.06817	1.12429	-0.061	0.9517	
## household.income[16K-25K]	-1.38480	1.03248	-1.341	0.1800	
## household.income[25K-35K]	0.40339	0.94577	0.427	0.6698	
## household.income[35K-50K]	-0.71028	0.92465	-0.768	0.4425	
## household.income[50K-75K]	-1.04628	0.90657	-1.154	0.2486	
## household.income[5K-12K]	0.22101	1.05915	0.209	0.8347	
## household.income[75K-100K]	-0.93949	0.91389	-1.028	0.3041	
## high.educBachelor	-0.16956	0.84517	-0.201	0.8410	
## high.educHS Diploma/GED	-0.31013	0.85714	-0.362	0.7175	
## high.educPost Graduate Degree	0.17402	0.85809	0.203	0.8393	
## high.educSome College	0.47665	0.79539	0.599	0.5491	
## PDS_score:caudate_posvsneg_feedback_z	0.41089	0.19275	2.132	0.0332	*

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0281
## lmer.REML = 11350  Scale est. = 15.053    n = 1848
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * caudate_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age +
```



```

##      bmi + household.income + high.educ
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.004228    2.564003   1.172 0.241473
## PDS_score         0.738043    0.264851   2.787 0.005381 **
## caudate_posvsneg_feedback_z      0.263956    0.409314   0.645 0.519091
## race.ethnicity.5levelBlack      -0.122024    1.081122  -0.113 0.910148
## race.ethnicity.5levelMixed      1.308752    1.053496   1.242 0.214288
## race.ethnicity.5levelOther      0.281773    1.191348   0.237 0.813059
## race.ethnicity.5levelWhite      1.176789    0.992934   1.185 0.236107
## demo_race_hispanic1      0.375257    0.407847   0.920 0.357647
## interview_age      0.007968    0.017059   0.467 0.640509
## bmi      0.021121    0.036967   0.571 0.567844
## household.income[>=200K]      -3.284541    0.987085  -3.328 0.000894 ***
## household.income[100K-200K]     -2.815522    0.930646  -3.025 0.002518 **
## household.income[12K-16K]      -1.132038    1.186248  -0.954 0.340058
## household.income[16K-25K]      -0.144790    1.027851  -0.141 0.887991
## household.income[25K-35K]      -0.559241    1.015415  -0.551 0.581872
## household.income[35K-50K]      -0.703973    0.971681  -0.724 0.468858
## household.income[50K-75K]      -2.196545    0.932866  -2.355 0.018647 *
## household.income[5K-12K]       -0.173524    1.103500  -0.157 0.875066
## household.income[75K-100K]     -2.886482    0.946159  -3.051 0.002316 **
## high.educBachelor      1.568339    0.947305   1.656 0.097979 .
## high.educHS Diploma/GED      -1.063308    0.975403  -1.090 0.275804
## high.educPost Graduate Degree    0.695531    0.947466   0.734 0.462985
## high.educSome College      0.931210    0.903483   1.031 0.302823
## PDS_score:caudate_posvsneg_feedback_z -0.319191    0.294216  -1.085 0.278116
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0366
## lmer.REML = 11453 Scale est. = 14.079    n = 1844

```

#### 4.8 Model: CBCL internalizing factor ~ PDS x Putamen activity (feedback)

##### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * putamen_posvsneg_feedback_z +
##      race.ethnicity.5level + demo_race_hispanic + interview_age +
##      bmi + household.income + high.educ
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.57505    2.43611   0.236  0.8134
## PDS_score         0.80088    0.19338   4.141 3.61e-05 ***
## putamen_posvsneg_feedback_z     -0.61980    0.36241  -1.710  0.0874 .
## race.ethnicity.5levelBlack     -0.59957    0.88903  -0.674  0.5001
## race.ethnicity.5levelMixed      1.06549    0.85352   1.248  0.2121

```

```

## race.ethnicity.5levelOther      -0.20223    1.02412   -0.197    0.8435
## race.ethnicity.5levelWhite      1.53343    0.79261    1.935    0.0532 .
## demo_race_hispanic1            -0.21173    0.39216   -0.540    0.5893
## interview_age                   0.01948    0.01738    1.121    0.2625
## bmi                             0.02802    0.03484    0.804    0.4214
## household.income[>=200K]        -2.01635    0.97301   -2.072    0.0384 *
## household.income[100K-200K]     -1.02319    0.90912   -1.125    0.2605
## household.income[12K-16K]        0.14503    1.13069    0.128    0.8980
## household.income[16K-25K]       -1.20627    1.03453   -1.166    0.2438
## household.income[25K-35K]        0.62129    0.95232    0.652    0.5142
## household.income[35K-50K]       -0.48021    0.93076   -0.516    0.6060
## household.income[50K-75K]       -0.83024    0.91322   -0.909    0.3634
## household.income[5K-12K]         0.54493    1.07020    0.509    0.6107
## household.income[75K-100K]      -0.81486    0.92045   -0.885    0.3761
## high.educBachelor               -0.33667    0.84974   -0.396    0.6920
## high.educHS Diploma/GED        -0.53510    0.86179   -0.621    0.5347
## high.educPost Graduate Degree    0.05744    0.86134    0.067    0.9468
## high.educSome College           0.33091    0.80000    0.414    0.6792
## PDS_score:putamen_posvsneg_feedback_z 0.31332    0.19814    1.581    0.1140
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0286
## lmer.REML = 11330  Scale est. = 15.573    n = 1845

```

## Males

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * putamen_posvsneg_feedback_z +
##    race.ethnicity.5level + demo_race_hispanic + interview_age +
##    bmi + household.income + high.educ
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.077138   2.578607   1.193 0.232894
## PDS_score       0.713497   0.265855   2.684 0.007345 **
## putamen_posvsneg_feedback_z 0.116789   0.400597   0.292 0.770673
## race.ethnicity.5levelBlack -0.091564   1.081925  -0.085 0.932564
## race.ethnicity.5levelMixed  1.316816   1.054779   1.248 0.212034
## race.ethnicity.5levelOther  0.265007   1.192768   0.222 0.824200
## race.ethnicity.5levelWhite  1.193574   0.993491   1.201 0.229754
## demo_race_hispanic1  0.332109   0.407206   0.816 0.414847
## interview_age    0.007625   0.017065   0.447 0.655041
## bmi              0.026963   0.036900   0.731 0.465050
## household.income[>=200K] -3.315514   0.992895  -3.339 0.000857 ***
## household.income[100K-200K] -2.862492   0.935670  -3.059 0.002251 **
## household.income[12K-16K]  -1.162753   1.191175  -0.976 0.329125
## household.income[16K-25K]  -0.174900   1.036935  -0.169 0.866075
## household.income[25K-35K]  -0.612503   1.021872  -0.599 0.548985

```

```

## household.income[35K-50K]          -0.748731    0.977299   -0.766  0.443702
## household.income[50K-75K]          -2.183867    0.938157   -2.328  0.020030 *
## household.income[5K-12K]           -0.252420    1.110944   -0.227  0.820284
## household.income[75K-100K]         -2.910663    0.951717   -3.058  0.002258 **
## high.educBachelor                  1.458417    0.952884    1.531  0.126059
## high.educHS Diploma/GED           -1.136266    0.980450   -1.159  0.246639
## high.educPost Graduate Degree       0.626871    0.952971    0.658  0.510745
## high.educSome College               0.867904    0.909644    0.954  0.340152
## PDS_score:putamen_posvsneg_feedback_z -0.117205    0.283941   -0.413  0.679816
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0358
## lmer.REML = 11489 Scale est. = 14.541    n = 1849

```

## 4.9 Model: CBCL internalizing factor ~ PDS x Lateral OFC activity (feedback stage)

### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * lOFC_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age +
##   bmi + household.income + high.educ
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.30976    2.43644   0.127  0.898847
## PDS_score       0.73791    0.19490   3.786  0.000158 ***
## lOFC_posvsneg_feedback_z -0.47278    0.58504  -0.808  0.419125
## race.ethnicity.5levelBlack -0.46824    0.89181  -0.525  0.599617
## race.ethnicity.5levelMixed  1.09005    0.85458   1.276  0.202283
## race.ethnicity.5levelOther -0.18063    1.02502  -0.176  0.860140
## race.ethnicity.5levelWhite  1.50079    0.79359   1.891  0.058766 .
## demo_race_hispanic1      -0.22674    0.39222  -0.578  0.563272
## interview_age      0.02290    0.01748   1.310  0.190270
## bmi               0.02970    0.03483   0.853  0.393892
## household.income[>=200K]    -2.21091    0.96851  -2.283  0.022557 *
## household.income[100K-200K] -1.20356    0.90400  -1.331  0.183231
## household.income[12K-16K]   -0.03615    1.12546  -0.032  0.974382
## household.income[16K-25K]   -1.37547    1.02896  -1.337  0.181471
## household.income[25K-35K]    0.51538    0.94793   0.544  0.586720
## household.income[35K-50K]   -0.60480    0.92575  -0.653  0.513641
## household.income[50K-75K]   -0.98708    0.90800  -1.087  0.277140
## household.income[5K-12K]     0.21756    1.06901   0.204  0.838755
## household.income[75K-100K]  -0.93897    0.91516  -1.026  0.305022
## high.educBachelor          -0.22976    0.83796  -0.274  0.783968
## high.educHS Diploma/GED    -0.33738    0.85104  -0.396  0.691831
## high.educPost Graduate Degree  0.19193    0.85135   0.225  0.821665

```

```
## high.educSome College          0.38717    0.78861    0.491 0.623516
## PDS_score:l0FC_posvsneg_feedback_z 0.32573    0.31273    1.042 0.297747
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0253
## lmer.REML = 11333 Scale est. = 15.886    n = 1845
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * l0FC_posvsneg_feedback_z +
##     race.ethnicity.5level + demo_race_hispanic + interview_age +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.567528   2.562908   1.002  0.31657
## PDS_score       0.676935   0.268108   2.525  0.01166 *
## l0FC_posvsneg_feedback_z -0.061789   0.595076  -0.104  0.91731
## race.ethnicity.5levelBlack -0.071107   1.089696  -0.065  0.94798
## race.ethnicity.5levelMixed  1.329647   1.064212   1.249  0.21167
## race.ethnicity.5levelOther  0.235045   1.198365   0.196  0.84452
## race.ethnicity.5levelWhite  1.233856   1.002795   1.230  0.21870
## demo_race_hispanic1    0.393637   0.410627   0.959  0.33788
## interview_age    0.009194   0.017018   0.540  0.58912
## bmi              0.026275   0.036987   0.710  0.47757
## household.income[>=200K] -3.109191   1.027046  -3.027  0.00250 **
## household.income[100K-200K] -2.638807   0.972604  -2.713  0.00673 **
## household.income[12K-16K]  -1.096754   1.227158  -0.894  0.37158
## household.income[16K-25K]   0.282532   1.075271   0.263  0.79277
## household.income[25K-35K]  -0.741261   1.057463  -0.701  0.48340
## household.income[35K-50K]  -0.570784   1.011264  -0.564  0.57253
## household.income[50K-75K]  -2.018260   0.975068  -2.070  0.03861 *
## household.income[5K-12K]    0.289728   1.131858   0.256  0.79800
## household.income[75K-100K] -2.740308   0.987973  -2.774  0.00560 **
## high.educBachelor    1.590826   0.949403   1.676  0.09399 .
## high.educHS Diploma/GED -0.727824   0.978583  -0.744  0.45712
## high.educPost Graduate Degree  0.751565   0.949321   0.792  0.42865
## high.educSome College    1.015511   0.907015   1.120  0.26302
## PDS_score:l0FC_posvsneg_feedback_z 0.054163   0.402000   0.135  0.89284
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0368
## lmer.REML = 11390 Scale est. = 13.732    n = 1838
```

#### 4.10 Model: CBCL internalizing factor ~ PDS x Medial OFC activity (feedback stage)

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * mOFC_posvsneg_feedback_z +
##     race.ethnicity.5level + demo_race_hispanic + interview_age +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##
```

	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	0.38712	2.43162	0.159	0.8735
## PDS_score	0.76028	0.19404	3.918	9.25e-05 ***
## mOFC_posvsneg_feedback_z	-0.50792	0.50771	-1.000	0.3172
## race.ethnicity.5levelBlack	-0.44012	0.89170	-0.494	0.6217
## race.ethnicity.5levelMixed	1.10747	0.85501	1.295	0.1954
## race.ethnicity.5levelOther	-0.16579	1.02495	-0.162	0.8715
## race.ethnicity.5levelWhite	1.52923	0.79407	1.926	0.0543 .
## demo_race_hispanic1	-0.23353	0.39138	-0.597	0.5508
## interview_age	0.02070	0.01742	1.188	0.2349
## bmi	0.03224	0.03473	0.928	0.3535
## household.income[>=200K]	-2.12483	0.96950	-2.192	0.0285 *
## household.income[100K-200K]	-1.09009	0.90505	-1.204	0.2286
## household.income[12K-16K]	0.02058	1.12426	0.018	0.9854
## household.income[16K-25K]	-1.25048	1.03215	-1.212	0.2258
## household.income[25K-35K]	0.53796	0.94739	0.568	0.5702
## household.income[35K-50K]	-0.57381	0.92545	-0.620	0.5353
## household.income[50K-75K]	-0.92159	0.90757	-1.015	0.3100
## household.income[5K-12K]	0.22099	1.07020	0.206	0.8364
## household.income[75K-100K]	-0.87021	0.91625	-0.950	0.3424
## high.educBachelor	-0.22513	0.83778	-0.269	0.7882
## high.educHS Diploma/GED	-0.35398	0.85094	-0.416	0.6775
## high.educPost Graduate Degree	0.19295	0.85138	0.227	0.8207
## high.educSome College	0.40759	0.78890	0.517	0.6055
## PDS_score:mOFC_posvsneg_feedback_z	0.48424	0.27660	1.751	0.0802 .

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0277
## lmer.REML = 11355  Scale est. = 15.46    n = 1849
```

##### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * mOFC_posvsneg_feedback_z +
```

```

##      race.ethnicity.5level + demo_race_hispanic + interview_age +
##      bmi + household.income + high.educ
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.508370   2.551745   0.983  0.32574
## PDS_score         0.680530   0.265937   2.559  0.01058 *
## mOFC_posvsneg_feedback_z -0.110384   0.510815  -0.216  0.82894
## race.ethnicity.5levelBlack -0.104075   1.087092  -0.096  0.92374
## race.ethnicity.5levelMixed  1.361193   1.061232   1.283  0.19978
## race.ethnicity.5levelOther  0.263816   1.194095   0.221  0.82517
## race.ethnicity.5levelWhite  1.245547   1.000695   1.245  0.21341
## demo_race_hispanic1      0.374382   0.407782   0.918  0.35869
## interview_age          0.009942   0.016954   0.586  0.55767
## bmi                  0.026877   0.036780   0.731  0.46503
## household.income[>=200K]   -3.126142   1.017381  -3.073  0.00215 **
## household.income[100K-200K] -2.652350   0.962729  -2.755  0.00593 **
## household.income[12K-16K]  -1.023856   1.209430  -0.847  0.39735
## household.income[16K-25K]   0.239296   1.056189   0.227  0.82079
## household.income[25K-35K]  -0.751904   1.048135  -0.717  0.47324
## household.income[35K-50K]  -0.570143   1.001645  -0.569  0.56929
## household.income[50K-75K]  -2.056041   0.964937  -2.131  0.03324 *
## household.income[5K-12K]    0.261112   1.122652   0.233  0.81611
## household.income[75K-100K] -2.750170   0.977886  -2.812  0.00497 **
## high.educBachelor        1.539549   0.939061   1.639  0.10129
## high.educHS Diploma/GED   -0.759596   0.967541  -0.785  0.43251
## high.educPost Graduate Degree  0.721519   0.938978   0.768  0.44234
## high.educSome College      0.979824   0.895528   1.094  0.27404
## PDS_score:mOFC_posvsneg_feedback_z -0.028308   0.353115  -0.080  0.93611
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0368
## lmer.REML = 11440 Scale est. = 13.673    n = 1847

```

#### 4.11 Model: CBCL internalizing factor ~ PDS x BIS-BAS

##### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * 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)      -1.964742   2.316890  -0.848  0.39652
## PDS_score         2.291122   0.572318   4.003 6.44e-05 ***
## bisbas_ss_basm_rr  0.270771   0.112787   2.401  0.01644 *
## race.ethnicity.5levelBlack -0.480223   0.801906  -0.599  0.54933

```

```
## race.ethnicity.5levelMixed      1.182151  0.779342  1.517  0.12944
## race.ethnicity.5levelOther     -0.142460  0.912020 -0.156  0.87589
## race.ethnicity.5levelWhite      1.176660  0.726192  1.620  0.10530
## demo_race_hispanic1            0.041940  0.348870  0.120  0.90432
## interview_age                   0.021133  0.015491  1.364  0.17265
## bmi                            0.022214  0.030695  0.724  0.46931
## household.income[>=200K]       -2.536212  0.839799 -3.020  0.00255 **
## household.income[100K-200K]    -1.589044  0.781394 -2.034  0.04210 *
## household.income[12K-16K]      -0.175324  1.001862 -0.175  0.86110
## household.income[16K-25K]      -1.301729  0.865942 -1.503  0.13291
## household.income[25K-35K]       0.034045  0.817465  0.042  0.96678
## household.income[35K-50K]      -1.233934  0.793966 -1.554  0.12028
## household.income[50K-75K]      -1.240914  0.778372 -1.594  0.11102
## household.income[5K-12K]       -0.009487  0.878712 -0.011  0.99139
## household.income[75K-100K]     -1.305847  0.792143 -1.648  0.09938 .
## high.educBachelor              0.838193  0.726124  1.154  0.24848
## high.educHS Diploma/GED        0.673239  0.729377  0.923  0.35608
## high.educPost Graduate Degree   1.254149  0.740103  1.695  0.09029 .
## high.educSome College           1.121949  0.677781  1.655  0.09799 .
## PDS_score:bisbas_ss_basm_rr    -0.185901  0.061830 -3.007  0.00267 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0242
## lmer.REML = 14690  Scale est. = 17.387    n = 2386
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * 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)    2.323785   2.413658   0.963 0.335757
## PDS_score       1.558044   0.836221   1.863 0.062550 .
## bisbas_ss_basm_rr 0.055826   0.126180   0.442 0.658214
## race.ethnicity.5levelBlack -0.642261   0.870655 -0.738 0.460780
## race.ethnicity.5levelMixed  1.126438   0.850371   1.325 0.185408
## race.ethnicity.5levelOther  0.001861   0.968613   0.002 0.998467
## race.ethnicity.5levelWhite  0.901458   0.799736   1.127 0.259766
## demo_race_hispanic1  0.149641   0.349418   0.428 0.668499
## interview_age     0.008886   0.014672   0.606 0.544832
## bmi              0.038379   0.030218   1.270 0.204167
## household.income[>=200K] -3.198453   0.817642 -3.912 9.4e-05 ***
## household.income[100K-200K] -2.514976   0.761712 -3.302 0.000974 ***
## household.income[12K-16K]  -0.401508   0.982888 -0.408 0.682942
## household.income[16K-25K]   0.068238   0.818906  0.083 0.933597
```

```
## household.income[25K-35K]      -0.021866   0.820398  -0.027 0.978739
## household.income[35K-50K]      -1.121953   0.777868  -1.442 0.149328
## household.income[50K-75K]      -1.614867   0.754396  -2.141 0.032400 *
## household.income[5K-12K]       0.012037   0.857908   0.014 0.988807
## household.income[75K-100K]     -2.702569   0.776130  -3.482 0.000506 ***
## high.educBachelor              1.566816   0.769204   2.037 0.041760 *
## high.educHS Diploma/GED       -0.780604   0.761865  -1.025 0.305651
## high.educPost Graduate Degree  0.821133   0.772003   1.064 0.287593
## high.educSome College          1.033586   0.731079   1.414 0.157549
## PDS_score:bisbas_ss_basm_rr    -0.110206   0.088112  -1.251 0.211137
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0376
## lmer.REML = 15990 Scale est. = 16.17      n = 2572
```

## 4.12 Model: CBCL internalizing factor ~ PDS x MID reaction time (large reward vs. neutral)

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * 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 Pr(>|t|)
## (Intercept)    0.477984   2.327932   0.205   0.8373
## PDS_score       0.851339   0.187443   4.542 5.91e-06 ***
## rt_diff_large_neutral_z 0.170917   0.322352   0.530   0.5960
## race.ethnicity.5levelBlack -0.804532   0.856333  -0.940   0.3476
## race.ethnicity.5levelMixed  0.725827   0.825624   0.879   0.3794
## race.ethnicity.5levelOther -0.376790   0.964664  -0.391   0.6961
## race.ethnicity.5levelWhite  1.171617   0.768723   1.524   0.1276
## demo_race_hispanic1 -0.102853   0.376584  -0.273   0.7848
## interview_age     0.021389   0.016842   1.270   0.2042
## bmi              0.021994   0.032978   0.667   0.5049
## household.income[>=200K]    -1.987153   0.923062  -2.153   0.0315 *
## household.income[100K-200K] -1.118499   0.860810  -1.299   0.1940
## household.income[12K-16K]   0.005363   1.085642   0.005   0.9961
## household.income[16K-25K]   -1.082031   0.960667  -1.126   0.2602
## household.income[25K-35K]   0.662600   0.900230   0.736   0.4618
## household.income[35K-50K]   -0.591733   0.875941  -0.676   0.4994
## household.income[50K-75K]   -0.928488   0.859971  -1.080   0.2804
## household.income[5K-12K]    0.750107   1.011190   0.742   0.4583
## household.income[75K-100K]  -0.898419   0.873788  -1.028   0.3040
## high.educBachelor          -0.052123   0.791281  -0.066   0.9475
## high.educHS Diploma/GED    -0.140798   0.804287  -0.175   0.8611
```



```
## high.educPost Graduate Degree      0.359388    0.806143    0.446    0.6558
## high.educSome College              0.559501    0.742926    0.753    0.4515
## PDS_score:rt_diff_large_neutral_z -0.040147    0.177109   -0.227    0.8207
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0272
## lmer.REML = 12303  Scale est. = 17.018    n = 2002
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * 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 Pr(>|t|)
## (Intercept)                  1.55204    2.42735   0.639  0.52264
## PDS_score                     0.71670    0.24366   2.941  0.00330 **
## rt_diff_large_neutral_z      0.94554    0.35008   2.701  0.00697 **
## race.ethnicity.5levelBlack   -0.66155    1.04415  -0.634  0.52643
## race.ethnicity.5levelMixed    0.81389    1.02285   0.796  0.42629
## race.ethnicity.5levelOther   -0.12240    1.13855  -0.108  0.91440
## race.ethnicity.5levelWhite    0.84771    0.96495   0.879  0.37978
## demo_race_hispanic1          0.18995    0.38897   0.488  0.62535
## interview_age                 0.01050    0.01608   0.653  0.51399
## bmi                          0.04047    0.03457   1.171  0.24192
## household.income[>=200K]     -2.52365    0.94036  -2.684  0.00734 **
## household.income[100K-200K]  -2.07217    0.88639  -2.338  0.01950 *
## household.income[12K-16K]     0.34620    1.11332   0.311  0.75586
## household.income[16K-25K]     0.80566    0.97095   0.830  0.40677
## household.income[25K-35K]     0.18345    0.95874   0.191  0.84827
## household.income[35K-50K]    -0.08184    0.90686  -0.090  0.92810
## household.income[50K-75K]    -1.19765    0.88244  -1.357  0.17487
## household.income[5K-12K]      0.58073    1.02432   0.567  0.57082
## household.income[75K-100K]   -2.12297    0.90179  -2.354  0.01866 *
## high.educBachelor             1.91706    0.89504   2.142  0.03232 *
## high.educHS Diploma/GED      -0.06892    0.90328  -0.076  0.93919
## high.educPost Graduate Degree  1.14465    0.89447   1.280  0.20080
## high.educSome College         1.18518    0.85039   1.394  0.16356
## PDS_score:rt_diff_large_neutral_z -0.79066    0.24890  -3.177  0.00151 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0373
## lmer.REML = 12775  Scale est. = 12.226    n = 2062
```

### 4.13 Model: CBCL internalizing factor ~ PDS x MID reaction time (large vs. small reward)

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * 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 Pr(>|t|)
## (Intercept)    0.448717   2.326099   0.193   0.8471
## PDS_score      0.849628   0.187453   4.532 6.18e-06 ***
## rt_diff_large_small_z 0.255889   0.302709   0.845   0.3980
## race.ethnicity.5levelBlack -0.788429   0.856263  -0.921   0.3573
## race.ethnicity.5levelMixed  0.742151   0.825685   0.899   0.3689
## race.ethnicity.5levelOther -0.349865   0.964353  -0.363   0.7168
## race.ethnicity.5levelWhite  1.190202   0.768384   1.549   0.1215
## demo_race_hispanic1 -0.111582   0.376431  -0.296   0.7669
## interview_age    0.021661   0.016829   1.287   0.1982
## bmi             0.021267   0.032988   0.645   0.5192
## household.income[>=200K] -1.989205   0.923604  -2.154   0.0314 *
## household.income[100K-200K] -1.131861   0.860815  -1.315   0.1887
## household.income[12K-16K] -0.003082   1.086192  -0.003   0.9977
## household.income[16K-25K] -1.102514   0.961085  -1.147   0.2515
## household.income[25K-35K]  0.668389   0.901156   0.742   0.4584
## household.income[35K-50K] -0.616173   0.875354  -0.704   0.4816
## household.income[50K-75K] -0.935777   0.860354  -1.088   0.2769
## household.income[5K-12K]  0.749634   1.011331   0.741   0.4586
## household.income[75K-100K] -0.907514   0.873743  -1.039   0.2991
## high.educBachelor -0.045600   0.790616  -0.058   0.9540
## high.educHS Diploma/GED -0.135695   0.803640  -0.169   0.8659
## high.educPost Graduate Degree 0.372269   0.805775   0.462   0.6441
## high.educSome College  0.580600   0.742551   0.782   0.4344
## PDS_score:rt_diff_large_small_z -0.085937   0.167660  -0.513   0.6083
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0273
## lmer.REML = 12303 Scale est. = 16.96    n = 2002
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * 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 Pr(>|t|)
## (Intercept)      1.686153    2.430953   0.694  0.48800
## PDS_score         0.703776    0.245000   2.873  0.00411 **
## rt_diff_large_small_z 0.370624    0.348644   1.063  0.28789
## race.ethnicity.5levelBlack -0.712790    1.046222  -0.681  0.49576
## race.ethnicity.5levelMixed  0.680494    1.023985   0.665  0.50641
## race.ethnicity.5levelOther -0.149277    1.141404  -0.131  0.89596
## race.ethnicity.5levelWhite  0.724499    0.966433   0.750  0.45354
## demo_race_hispanic1  0.209392    0.389923   0.537  0.59132
## interview_age      0.009529    0.016096   0.592  0.55391
## bmi                0.041360    0.034644   1.194  0.23267
## household.income[>=200K] -2.457091    0.942077  -2.608  0.00917 **
## household.income[100K-200K] -2.012993    0.888211  -2.266  0.02353 *
## household.income[12K-16K]  0.260501    1.115633   0.234  0.81540
## household.income[16K-25K]  0.911029    0.972723   0.937  0.34909
## household.income[25K-35K]  0.249104    0.961110   0.259  0.79552
## household.income[35K-50K]  0.019223    0.908030   0.021  0.98311
## household.income[50K-75K] -1.122310    0.884045  -1.270  0.20440
## household.income[5K-12K]   0.725082    1.025547   0.707  0.47964
## household.income[75K-100K] -2.043640    0.903525  -2.262  0.02381 *
## high.educBachelor      1.940672    0.896913   2.164  0.03060 *
## high.educHS Diploma/GED -0.082517    0.905297  -0.091  0.92738
## high.educPost Graduate Degree 1.176035    0.896301   1.312  0.18963
## high.educSome College    1.207962    0.852237   1.417  0.15652
## PDS_score:rt_diff_large_small_z -0.352952    0.247525  -1.426  0.15404
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0348
## lmer.REML = 12783  Scale est. = 12.228    n = 2062

```

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

##### Females

```

## 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)	-9.452e-01	2.607e+00	-0.363
## PDS_score	8.551e-01	2.049e-01	4.173
## hormone_sal_end_min_since_midnight	8.284e-06	7.971e-04	0.010
## hormone_scr_ert_mean	-3.709e-03	8.177e-03	-0.454
## accumbens_rvsnt_ant_z	5.906e-01	4.223e-01	1.398
## race.ethnicity.5levelBlack	-7.315e-01	9.032e-01	-0.810
## race.ethnicity.5levelMixed	8.865e-01	8.682e-01	1.021
## race.ethnicity.5levelOther	-5.864e-01	1.052e+00	-0.558
## race.ethnicity.5levelWhite	1.441e+00	8.030e-01	1.794
## demo_race_hispanic1	-1.305e-01	4.041e-01	-0.323
## interview_age	2.881e-02	1.812e-02	1.590
## MRI_minus_hormone_date_time	4.022e-05	1.635e-05	2.460
## bmi	4.328e-02	3.677e-02	1.177
## household.income[>=200K]	-2.260e+00	9.943e-01	-2.273
## household.income[100K-200K]	-1.423e+00	9.238e-01	-1.540
## household.income[12K-16K]	-2.295e-01	1.154e+00	-0.199
## household.income[16K-25K]	-1.379e+00	1.061e+00	-1.300
## household.income[25K-35K]	1.957e-01	9.656e-01	0.203
## household.income[35K-50K]	-9.535e-01	9.437e-01	-1.010
## household.income[50K-75K]	-1.266e+00	9.306e-01	-1.360
## household.income[5K-12K]	-4.892e-01	1.124e+00	-0.435
## household.income[75K-100K]	-1.196e+00	9.340e-01	-1.281
## high.educBachelor	1.943e-01	8.811e-01	0.221
## high.educHS Diploma/GED	-9.843e-02	8.924e-01	-0.110
## high.educPost Graduate Degree	5.533e-01	8.958e-01	0.618
## high.educSome College	7.772e-01	8.294e-01	0.937
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z	-2.352e-02	1.019e-02	-2.307
##	Pr(> t )		
## (Intercept)	0.7169		
## PDS_score	3.17e-05 ***		
## hormone_sal_end_min_since_midnight	0.9917		
## hormone_scr_ert_mean	0.6502		
## accumbens_rvsnt_ant_z	0.1622		
## race.ethnicity.5levelBlack	0.4181		
## race.ethnicity.5levelMixed	0.3074		
## race.ethnicity.5levelOther	0.5772		
## race.ethnicity.5levelWhite	0.0730 .		
## demo_race_hispanic1	0.7467		
## interview_age	0.1120		
## MRI_minus_hormone_date_time	0.0140 *		
## bmi	0.2394		
## household.income[>=200K]	0.0231 *		
## household.income[100K-200K]	0.1236		
## household.income[12K-16K]	0.8424		
## household.income[16K-25K]	0.1937		
## household.income[25K-35K]	0.8394		
## household.income[35K-50K]	0.3124		
## household.income[50K-75K]	0.1740		
## household.income[5K-12K]	0.6636		
## household.income[75K-100K]	0.2004		
## high.educBachelor	0.8255		
## high.educHS Diploma/GED	0.9122		
## high.educPost Graduate Degree	0.5369		

```
## high.educSome College 0.3489
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z 0.0212 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.034
## lmer.REML = 10241 Scale est. = 15.403 n = 1669
```

## Males

```
## 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_rvsnt_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) 2.623e+00 2.687e+00 0.976
## PDS_score 7.895e-01 2.800e-01 2.820
## hormone_sal_end_min_since_midnight 7.604e-04 8.077e-04 0.941
## hormone_scr_ert_mean 8.202e-03 9.327e-03 0.879
## accumbens_rvsnt_ant_z 3.884e-02 4.266e-01 0.091
## race.ethnicity.5levelBlack 7.413e-02 1.127e+00 0.066
## race.ethnicity.5levelMixed 1.254e+00 1.096e+00 1.144
## race.ethnicity.5levelOther 5.522e-01 1.233e+00 0.448
## race.ethnicity.5levelWhite 1.442e+00 1.033e+00 1.396
## demo_race_hispanic1 -1.038e-02 4.238e-01 -0.024
## interview_age 6.555e-03 1.751e-02 0.374
## MRI_minus_hormone_date_time 2.137e-05 1.863e-05 1.147
## bmi 6.158e-04 3.782e-02 0.016
## household.income[>=200K] -3.040e+00 1.029e+00 -2.954
## household.income[100K-200K] -2.607e+00 9.732e-01 -2.678
## household.income[12K-16K] -5.505e-01 1.258e+00 -0.438
## household.income[16K-25K] 3.242e-01 1.071e+00 0.303
## household.income[25K-35K] -7.992e-01 1.052e+00 -0.760
## household.income[35K-50K] -6.562e-01 1.023e+00 -0.641
## household.income[50K-75K] -2.072e+00 9.702e-01 -2.135
## household.income[5K-12K] 2.984e-01 1.118e+00 0.267
## household.income[75K-100K] -2.701e+00 9.915e-01 -2.724
## high.educBachelor 1.099e+00 9.811e-01 1.120
## high.educHS Diploma/GED -1.128e+00 1.010e+00 -1.117
## high.educPost Graduate Degree 2.286e-01 9.835e-01 0.232
## high.educSome College 6.613e-01 9.375e-01 0.705
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z -4.202e-03 1.254e-02 -0.335
##
## Pr(>|t|)
## (Intercept) 0.32907
```

```

## PDS_score 0.00486 **
## hormone_sal_end_min_since_midnight 0.34660
## hormone_scr_ert_mean 0.37927
## accumbens_rvsnt_ant_z 0.92747
## race.ethnicity.5levelBlack 0.94754
## race.ethnicity.5levelMixed 0.25264
## race.ethnicity.5levelOther 0.65442
## race.ethnicity.5levelWhite 0.16302
## demo_race_hispanic1 0.98046
## interview_age 0.70818
## MRI_minus_hormone_date_time 0.25149
## bmi 0.98701
## household.income[>=200K] 0.00318 **
## household.income[100K-200K] 0.00747 **
## household.income[12K-16K] 0.66175
## household.income[16K-25K] 0.76223
## household.income[25K-35K] 0.44755
## household.income[35K-50K] 0.52148
## household.income[50K-75K] 0.03290 *
## household.income[5K-12K] 0.78951
## household.income[75K-100K] 0.00652 **
## high.educBachelor 0.26282
## high.educHS Diploma/GED 0.26421
## high.educPost Graduate Degree 0.81621
## high.educSome College 0.48064
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z 0.73758
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.038
## lmer.REML = 10469 Scale est. = 11.823 n = 1688

```

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

##### Females

```

## 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_rvsnt_ant_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##   bmi + household.income + high.educ
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) -4.883e-01 2.616e+00 -0.187 0.85196
## PDS_score    8.134e-01 2.054e-01 3.959 7.85e-05

```

```

## hormone_sal_end_min_since_midnight -3.392e-05 8.014e-04 -0.042 0.96624
## hormone_scr_ert_mean -3.980e-03 8.231e-03 -0.484 0.62879
## caudate_rvsnt_ant_z 4.947e-01 3.215e-01 1.538 0.12412
## race.ethnicity.5levelBlack -7.525e-01 9.076e-01 -0.829 0.40720
## race.ethnicity.5levelMixed 8.977e-01 8.715e-01 1.030 0.30316
## race.ethnicity.5levelOther -5.283e-01 1.057e+00 -0.500 0.61721
## race.ethnicity.5levelWhite 1.477e+00 8.064e-01 1.832 0.06717
## demo_race_hispanic1 -1.875e-01 4.050e-01 -0.463 0.64350
## interview_age 2.639e-02 1.824e-02 1.447 0.14804
## MRI_minus_hormone_date_time 4.122e-05 1.646e-05 2.505 0.01234
## bmi 5.585e-02 3.659e-02 1.526 0.12715
## household.income[>=200K] -2.629e+00 9.922e-01 -2.650 0.00813
## household.income[100K-200K] -1.747e+00 9.209e-01 -1.897 0.05799
## household.income[12K-16K] -4.319e-01 1.160e+00 -0.372 0.70965
## household.income[16K-25K] -1.656e+00 1.059e+00 -1.563 0.11829
## household.income[25K-35K] -1.877e-01 9.615e-01 -0.195 0.84522
## household.income[35K-50K] -1.270e+00 9.391e-01 -1.352 0.17659
## household.income[50K-75K] -1.558e+00 9.264e-01 -1.682 0.09275
## household.income[5K-12K] -7.828e-01 1.124e+00 -0.697 0.48609
## household.income[75K-100K] -1.543e+00 9.321e-01 -1.655 0.09809
## high.educBachelor 1.966e-01 8.796e-01 0.223 0.82320
## high.educHS Diploma/GED -7.450e-02 8.950e-01 -0.083 0.93367
## high.educPost Graduate Degree 6.087e-01 8.941e-01 0.681 0.49608
## high.educSome College 7.508e-01 8.296e-01 0.905 0.36556
## hormone_scr_ert_mean:caudate_rvsnt_ant_z -1.218e-02 8.165e-03 -1.491 0.13611
##
## (Intercept)
## PDS_score ***
## hormone_sal_end_min_since_midnight
## hormone_scr_ert_mean
## caudate_rvsnt_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_rvsnt_ant_z
## ---

```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0304
## lmer.REML = 10279  Scale est. = 16.006    n = 1672
```

## Males

```
## 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_rvsnt_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)      2.356e+00  2.682e+00   0.878  0.37984
## PDS_score         7.755e-01  2.822e-01   2.748  0.00606
## hormone_sal_end_min_since_midnight  7.009e-04  8.073e-04   0.868  0.38538
## hormone_scr_ert_mean  7.209e-03  9.322e-03   0.773  0.43947
## caudate_rvsnt_ant_z  3.088e-01  3.304e-01   0.935  0.35012
## race.ethnicity.5levelBlack  1.145e-01  1.125e+00   0.102  0.91895
## race.ethnicity.5levelMixed  1.344e+00  1.096e+00   1.227  0.22010
## race.ethnicity.5levelOther  4.969e-01  1.233e+00   0.403  0.68699
## race.ethnicity.5levelWhite  1.484e+00  1.034e+00   1.435  0.15141
## demo_race_hispanic1  7.026e-02  4.268e-01   0.165  0.86926
## interview_age      6.924e-03  1.756e-02   0.394  0.69339
## MRI_minus_hormone_date_time  1.922e-05  1.817e-05   1.057  0.29051
## bmi                5.344e-03  3.799e-02   0.141  0.88814
## household.income[>=200K] -2.897e+00  1.020e+00 -2.841  0.00456
## household.income[100K-200K] -2.393e+00  9.632e-01 -2.485  0.01307
## household.income[12K-16K]   3.504e-02  1.261e+00   0.028  0.97783
## household.income[16K-25K]   6.452e-01  1.061e+00   0.608  0.54305
## household.income[25K-35K]  -5.380e-01  1.046e+00 -0.514  0.60712
## household.income[35K-50K]  -5.053e-01  1.014e+00 -0.498  0.61839
## household.income[50K-75K]  -1.777e+00  9.600e-01 -1.851  0.06428
## household.income[5K-12K]    6.633e-01  1.113e+00   0.596  0.55138
## household.income[75K-100K] -2.420e+00  9.797e-01 -2.470  0.01362
## high.educBachelor          1.091e+00  9.659e-01   1.130  0.25879
## high.educHS Diploma/GED   -1.196e+00  9.948e-01 -1.202  0.22941
## high.educPost Graduate Degree  2.441e-01  9.696e-01   0.252  0.80125
## high.educSome College      6.243e-01  9.235e-01   0.676  0.49910
## hormone_scr_ert_mean:caudate_rvsnt_ant_z -7.065e-03  9.355e-03 -0.755  0.45022
##
## (Intercept)
## PDS_score **
## hormone_sal_end_min_since_midnight
## hormone_scr_ert_mean
```



```

## caudate_rvs_n_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_rvs_n_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0386
## lmer.REML = 10506  Scale est. = 11.816    n = 1693

```

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

##### Females

```

## 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_rvs_n_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)    -7.804e-01  2.617e+00  -0.298   0.7656
## PDS_score        8.319e-01  2.058e-01   4.042 5.54e-05
## hormone_sal_end_min_since_midnight  8.783e-05  7.995e-04   0.110   0.9125
## hormone_scr_ert_mean    -3.805e-03  8.236e-03  -0.462   0.6441
## putamen_rvs_n_ant_z     4.369e-01  3.285e-01   1.330   0.1836

```

```

## race.ethnicity.5levelBlack          -7.620e-01  9.070e-01  -0.840  0.4010
## race.ethnicity.5levelMixed           9.132e-01  8.718e-01   1.048  0.2950
## race.ethnicity.5levelOther          -5.566e-01  1.055e+00  -0.527  0.5980
## race.ethnicity.5levelWhite           1.491e+00  8.063e-01   1.849  0.0647
## demo_race_hispanic1                 -1.718e-01  4.049e-01  -0.424  0.6714
## interview_age                        2.640e-02  1.824e-02   1.448  0.1479
## MRI_minus_hormone_date_time          4.011e-05  1.643e-05   2.442  0.0147
## bmi                                  5.184e-02  3.681e-02   1.408  0.1592
## household.income[>=200K]             -2.472e+00  9.995e-01  -2.473  0.0135
## household.income[100K-200K]          -1.563e+00  9.298e-01  -1.681  0.0929
## household.income[12K-16K]            -2.943e-01  1.162e+00  -0.253  0.8001
## household.income[16K-25K]            -1.397e+00  1.070e+00  -1.306  0.1918
## household.income[25K-35K]             6.128e-03  9.716e-01   0.006  0.9950
## household.income[35K-50K]            -1.034e+00  9.496e-01  -1.088  0.2766
## household.income[50K-75K]            -1.363e+00  9.351e-01  -1.458  0.1452
## household.income[5K-12K]             -5.567e-01  1.132e+00  -0.492  0.6228
## household.income[75K-100K]           -1.334e+00  9.404e-01  -1.419  0.1561
## high.educBachelor                    2.608e-01  8.755e-01   0.298  0.7658
## high.educHS Diploma/GED              -7.912e-02  8.898e-01  -0.089  0.9292
## high.educPost Graduate Degree         6.494e-01  8.901e-01   0.730  0.4657
## high.educSome College                 7.941e-01  8.245e-01   0.963  0.3356
## hormone_scr_ert_mean:putamen_rvsn_ant_z -9.214e-03  8.488e-03  -1.085  0.2779
##
## (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) = 0.0305
## lmer.REML = 10280 Scale est. = 15.953 n = 1672
```

## Males

```
## 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_rvsnt_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)	2.549e+00	2.687e+00	0.949	0.34297
## PDS_score	8.005e-01	2.837e-01	2.821	0.00484
## hormone_sal_end_min_since_midnight	7.121e-04	8.096e-04	0.879	0.37926
## hormone_scr_ert_mean	6.472e-03	9.320e-03	0.694	0.48755
## putamen_rvsnt_ant_z	-5.895e-02	3.433e-01	-0.172	0.86369
## race.ethnicity.5levelBlack	1.730e-01	1.127e+00	0.153	0.87805
## race.ethnicity.5levelMixed	1.308e+00	1.099e+00	1.190	0.23405
## race.ethnicity.5levelOther	5.104e-01	1.235e+00	0.413	0.67953
## race.ethnicity.5levelWhite	1.450e+00	1.037e+00	1.399	0.16196
## demo_race_hispanic1	5.566e-02	4.257e-01	0.131	0.89599
## interview_age	4.736e-03	1.761e-02	0.269	0.78795
## MRI_minus_hormone_date_time	2.161e-05	1.825e-05	1.184	0.23653
## bmi	4.257e-03	3.812e-02	0.112	0.91110
## household.income[>=200K]	-2.919e+00	1.020e+00	-2.862	0.00426
## household.income[100K-200K]	-2.470e+00	9.627e-01	-2.566	0.01038
## household.income[12K-16K]	-2.336e-01	1.252e+00	-0.187	0.85204
## household.income[16K-25K]	5.408e-01	1.058e+00	0.511	0.60940
## household.income[25K-35K]	-6.314e-01	1.044e+00	-0.605	0.54552
## household.income[35K-50K]	-5.728e-01	1.015e+00	-0.564	0.57259
## household.income[50K-75K]	-1.832e+00	9.598e-01	-1.909	0.05642
## household.income[5K-12K]	3.540e-01	1.105e+00	0.320	0.74878
## household.income[75K-100K]	-2.459e+00	9.805e-01	-2.508	0.01223
## high.educBachelor	1.251e+00	9.596e-01	1.304	0.19250
## high.educHS Diploma/GED	-1.099e+00	9.887e-01	-1.111	0.26668
## high.educPost Graduate Degree	4.092e-01	9.635e-01	0.425	0.67110
## high.educSome College	7.486e-01	9.156e-01	0.818	0.41372
## hormone_scr_ert_mean:putamen_rvsnt_ant_z	-7.128e-04	9.934e-03	-0.072	0.94281

```
##
```

```
## (Intercept)
```

```
## PDS_score **
```

```
## hormone_sal_end_min_since_midnight
```

```
## hormone_scr_ert_mean
```

```
## putamen_rvsnt_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) =  0.0365
## lmer.REML = 10518  Scale est. = 11.969    n = 1694

```

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

##### Females

```

## 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)    -7.949e-01  2.625e+00
## PDS_score        8.086e-01  2.071e-01
## hormone_sal_end_min_since_midnight  9.388e-05  8.022e-04
## hormone_scr_ert_mean    -3.682e-03  8.265e-03
## accumbens_posvsneg_feedback_z    2.404e-01  4.472e-01
## race.ethnicity.5levelBlack    -6.950e-01  9.106e-01
## race.ethnicity.5levelMixed     9.445e-01  8.732e-01
## race.ethnicity.5levelOther    -4.542e-01  1.054e+00

```

```

## race.ethnicity.5levelWhite          1.482e+00  8.069e-01
## demo_race_hispanic1                 -2.111e-01  4.092e-01
## interview_age                        2.648e-02  1.830e-02
## MRI_minus_hormone_date_time          3.967e-05  1.643e-05
## bmi                                 5.208e-02  3.679e-02
## household.income[>=200K]             -2.401e+00  1.001e+00
## household.income[100K-200K]          -1.445e+00  9.304e-01
## household.income[12K-16K]            -2.560e-01  1.162e+00
## household.income[16K-25K]            -1.414e+00  1.069e+00
## household.income[25K-35K]             7.553e-02  9.706e-01
## household.income[35K-50K]            -9.574e-01  9.511e-01
## household.income[50K-75K]            -1.244e+00  9.377e-01
## household.income[5K-12K]             -6.201e-01  1.139e+00
## household.income[75K-100K]           -1.218e+00  9.430e-01
## high.educBachelor                    1.842e-01  8.873e-01
## high.educHS Diploma/GED             -9.178e-02  8.989e-01
## high.educPost Graduate Degree         5.942e-01  9.024e-01
## high.educSome College                 7.220e-01  8.347e-01
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z -4.005e-04  1.121e-02
##                                     t value Pr(>|t|)
## (Intercept)                         -0.303   0.7621
## PDS_score                           3.905   9.8e-05 ***
## hormone_sal_end_min_since_midnight    0.117   0.9068
## hormone_scr_ert_mean                 -0.446   0.6560
## accumbens_posvsneg_feedback_z         0.538   0.5909
## race.ethnicity.5levelBlack            -0.763   0.4454
## race.ethnicity.5levelMixed             1.082   0.2796
## race.ethnicity.5levelOther            -0.431   0.6665
## race.ethnicity.5levelWhite             1.837   0.0664 .
## demo_race_hispanic1                  -0.516   0.6060
## interview_age                         1.447   0.1480
## MRI_minus_hormone_date_time            2.415   0.0159 *
## bmi                                  1.415   0.1571
## household.income[>=200K]              -2.400   0.0165 *
## household.income[100K-200K]           -1.553   0.1207
## household.income[12K-16K]             -0.220   0.8257
## household.income[16K-25K]             -1.323   0.1860
## household.income[25K-35K]              0.078   0.9380
## household.income[35K-50K]            -1.007   0.3143
## household.income[50K-75K]            -1.326   0.1849
## household.income[5K-12K]             -0.544   0.5862
## household.income[75K-100K]           -1.292   0.1965
## high.educBachelor                     0.208   0.8356
## high.educHS Diploma/GED              -0.102   0.9187
## high.educPost Graduate Degree          0.659   0.5103
## high.educSome College                  0.865   0.3872
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z -0.036   0.9715
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0284
## lmer.REML = 10256 Scale est. = 15.925    n = 1668

```

## Males

```
## 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)      3.025e+00  2.701e+00
## PDS_score         7.940e-01  2.807e-01
## hormone_sal_end_min_since_midnight  5.908e-04  8.080e-04
## hormone_scr_ert_mean  4.565e-03  9.331e-03
## accumbens_posvsneg_feedback_z -1.984e-01  4.158e-01
## race.ethnicity.5levelBlack  5.119e-03  1.142e+00
## race.ethnicity.5levelMixed  1.303e+00  1.113e+00
## race.ethnicity.5levelOther  4.186e-01  1.247e+00
## race.ethnicity.5levelWhite  1.469e+00  1.052e+00
## demo_race_hispanic1  6.537e-02  4.231e-01
## interview_age  2.411e-03  1.755e-02
## MRI_minus_hormone_date_time  1.969e-05  1.865e-05
## bmi  2.597e-02  3.799e-02
## household.income[>=200K] -3.330e+00  1.041e+00
## household.income[100K-200K] -2.967e+00  9.846e-01
## household.income[12K-16K] -7.016e-01  1.257e+00
## household.income[16K-25K]  1.133e-01  1.079e+00
## household.income[25K-35K] -1.022e+00  1.066e+00
## household.income[35K-50K] -9.407e-01  1.034e+00
## household.income[50K-75K] -2.307e+00  9.827e-01
## household.income[5K-12K]  4.254e-02  1.140e+00
## household.income[75K-100K] -2.952e+00  1.003e+00
## high.educBachelor  1.280e+00  9.646e-01
## high.educHS Diploma/GED -1.084e+00  9.945e-01
## high.educPost Graduate Degree  4.597e-01  9.674e-01
## high.educSome College  8.071e-01  9.206e-01
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z -1.046e-03  1.234e-02
##
##               t value Pr(>|t|)
## (Intercept)      1.120  0.26301
## PDS_score         2.828  0.00474 **
## hormone_sal_end_min_since_midnight  0.731  0.46472
## hormone_scr_ert_mean  0.489  0.62474
## accumbens_posvsneg_feedback_z -0.477  0.63338
## race.ethnicity.5levelBlack  0.004  0.99642
## race.ethnicity.5levelMixed  1.170  0.24198
## race.ethnicity.5levelOther  0.336  0.73722
## race.ethnicity.5levelWhite  1.396  0.16298
## demo_race_hispanic1  0.154  0.87724
```

```

## interview_age                0.137  0.89076
## MRI_minus_hormone_date_time  1.056  0.29126
## bmi                          0.684  0.49430
## household.income[>=200K]     -3.199  0.00141 **
## household.income[100K-200K]  -3.013  0.00263 **
## household.income[12K-16K]    -0.558  0.57684
## household.income[16K-25K]     0.105  0.91634
## household.income[25K-35K]    -0.958  0.33801
## household.income[35K-50K]    -0.910  0.36314
## household.income[50K-75K]    -2.347  0.01903 *
## household.income[5K-12K]      0.037  0.97022
## household.income[75K-100K]   -2.943  0.00330 **
## high.educBachelor            1.327  0.18461
## high.educHS Diploma/GED     -1.090  0.27585
## high.educPost Graduate Degree  0.475  0.63469
## high.educSome College        0.877  0.38076
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z -0.085  0.93242
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0391
## lmer.REML = 10499  Scale est. = 11.678    n = 1692

```

#### 4.18 Model: CBCL internalizing factor ~ Testosterone x Caudate activity (Feed-back stage) + PDS

##### Females

```

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

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##   hormone_scr_ert_mean * caudate_posvsneg_feedback_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##   bmi + household.income + high.educ
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)   -5.841e-01  2.615e+00  -0.223
## PDS_score       8.067e-01  2.058e-01   3.919
## hormone_sal_end_min_since_midnight -2.040e-05  8.007e-04  -0.025
## hormone_scr_ert_mean -2.745e-03  8.232e-03  -0.333
## caudate_posvsneg_feedback_z -1.008e-01  3.496e-01  -0.288
## race.ethnicity.5levelBlack -8.449e-01  9.111e-01  -0.927
## race.ethnicity.5levelMixed  8.695e-01  8.737e-01   0.995
## race.ethnicity.5levelOther -5.496e-01  1.053e+00  -0.522
## race.ethnicity.5levelWhite  1.468e+00  8.079e-01   1.817
## demo_race_hispanic1 -1.677e-01  4.058e-01  -0.413
## interview_age    2.722e-02  1.828e-02   1.489

```

```

## MRI_minus_hormone_date_time          4.026e-05  1.642e-05  2.451
## bmi                                  5.339e-02  3.676e-02  1.452
## household.income[>=200K]             -2.613e+00  9.933e-01 -2.630
## household.income[100K-200K]          -1.747e+00  9.219e-01 -1.894
## household.income[12K-16K]            -5.951e-01  1.154e+00 -0.516
## household.income[16K-25K]            -1.659e+00  1.064e+00 -1.559
## household.income[25K-35K]            -2.102e-01  9.625e-01 -0.218
## household.income[35K-50K]            -1.273e+00  9.431e-01 -1.349
## household.income[50K-75K]            -1.560e+00  9.273e-01 -1.682
## household.income[5K-12K]             -7.702e-01  1.125e+00 -0.685
## household.income[75K-100K]           -1.521e+00  9.322e-01 -1.632
## high.educBachelor                    2.517e-01  8.831e-01  0.285
## high.educHS Diploma/GED              4.783e-02  8.967e-01  0.053
## high.educPost Graduate Degree         6.008e-01  8.976e-01  0.669
## high.educSome College                 8.141e-01  8.315e-01  0.979
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 8.726e-04  9.032e-03  0.097
##                                     Pr(>|t|)
## (Intercept)                          0.82329
## PDS_score                             9.24e-05 ***
## hormone_sal_end_min_since_midnight    0.97967
## hormone_scr_ert_mean                  0.73884
## caudate_posvsneg_feedback_z           0.77321
## race.ethnicity.5levelBlack             0.35389
## race.ethnicity.5levelMixed             0.31978
## race.ethnicity.5levelOther             0.60183
## race.ethnicity.5levelWhite             0.06944 .
## demo_race_hispanic1                   0.67949
## interview_age                         0.13666
## MRI_minus_hormone_date_time            0.01435 *
## bmi                                   0.14658
## household.income[>=200K]               0.00862 **
## household.income[100K-200K]            0.05834 .
## household.income[12K-16K]             0.60613
## household.income[16K-25K]             0.11913
## household.income[25K-35K]             0.82713
## household.income[35K-50K]             0.17739
## household.income[50K-75K]             0.09267 .
## household.income[5K-12K]              0.49370
## household.income[75K-100K]            0.10288
## high.educBachelor                     0.77564
## high.educHS Diploma/GED               0.95746
## high.educPost Graduate Degree          0.50334
## high.educSome College                  0.32772
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.92305
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.029
## lmer.REML = 10268  Scale est. = 16.02    n = 1670

```

## Males

```
## 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)                      2.833e+00  2.698e+00   1.050
## PDS_score                        7.713e-01  2.807e-01   2.747
## hormone_sal_end_min_since_midnight 9.527e-04  8.087e-04   1.178
## hormone_scr_ert_mean             5.297e-03  9.382e-03   0.565
## caudate_posvsneg_feedback_z      -1.304e-01  3.366e-01  -0.387
## race.ethnicity.5levelBlack        8.907e-02  1.129e+00   0.079
## race.ethnicity.5levelMixed        1.275e+00  1.098e+00   1.161
## race.ethnicity.5levelOther        4.340e-01  1.235e+00   0.351
## race.ethnicity.5levelWhite        1.398e+00  1.036e+00   1.349
## demo_race_hispanic1              6.808e-02  4.235e-01   0.161
## interview_age                    2.357e-03  1.763e-02   0.134
## MRI_minus_hormone_date_time       1.947e-05  1.818e-05   1.071
## bmi                              7.264e-03  3.794e-02   0.191
## household.income[>=200K]          -2.966e+00  1.026e+00  -2.890
## household.income[100K-200K]       -2.557e+00  9.697e-01  -2.637
## household.income[12K-16K]         -3.698e-01  1.248e+00  -0.296
## household.income[16K-25K]         4.298e-01  1.068e+00   0.402
## household.income[25K-35K]        -6.436e-01  1.052e+00  -0.612
## household.income[35K-50K]        -5.728e-01  1.020e+00  -0.561
## household.income[50K-75K]        -1.931e+00  9.673e-01  -1.996
## household.income[5K-12K]          6.400e-02  1.124e+00   0.057
## household.income[75K-100K]       -2.570e+00  9.873e-01  -2.603
## high.educBachelor                 1.231e+00  9.668e-01   1.273
## high.educHS Diploma/GED         -1.079e+00  1.000e+00  -1.079
## high.educPost Graduate Degree     3.709e-01  9.697e-01   0.382
## high.educSome College             7.195e-01  9.219e-01   0.781
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 1.719e-03  9.777e-03   0.176
##
##                                     Pr(>|t|)
## (Intercept)                      0.29383
## PDS_score                        0.00607 **
## hormone_sal_end_min_since_midnight 0.23897
## hormone_scr_ert_mean             0.57242
## caudate_posvsneg_feedback_z      0.69848
## race.ethnicity.5levelBlack        0.93712
## race.ethnicity.5levelMixed        0.24575
## race.ethnicity.5levelOther        0.72539
## race.ethnicity.5levelWhite        0.17749
## demo_race_hispanic1              0.87230
## interview_age                    0.89367
## MRI_minus_hormone_date_time       0.28447
```

```
## bmi 0.84820
## household.income[>=200K] 0.00390 **
## household.income[100K-200K] 0.00844 **
## household.income[12K-16K] 0.76705
## household.income[16K-25K] 0.68756
## household.income[25K-35K] 0.54066
## household.income[35K-50K] 0.57456
## household.income[50K-75K] 0.04605 *
## household.income[5K-12K] 0.95459
## household.income[75K-100K] 0.00932 **
## high.educBachelor 0.20321
## high.educHS Diploma/GED 0.28092
## high.educPost Graduate Degree 0.70216
## high.educSome College 0.43520
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.86044
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0348
## lmer.REML = 10471 Scale est. = 12.369 n = 1685
```

#### 4.19 Model: CBCL internalizing factor ~ Testosterone x Putamen activity (Feed-back stage) + PDS

##### Females

```
## 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) -7.672e-01 2.616e+00 -0.293
## PDS_score    8.623e-01 2.064e-01 4.178
## hormone_sal_end_min_since_midnight 1.615e-05 8.024e-04 0.020
## hormone_scr_ert_mean -4.140e-03 8.260e-03 -0.501
## putamen_posvsneg_feedback_z 1.294e-01 3.542e-01 0.365
## race.ethnicity.5levelBlack -7.112e-01 9.080e-01 -0.783
## race.ethnicity.5levelMixed 9.082e-01 8.718e-01 1.042
## race.ethnicity.5levelOther -6.296e-01 1.054e+00 -0.597
## race.ethnicity.5levelWhite 1.503e+00 8.064e-01 1.863
## demo_race_hispanic1 -9.560e-02 4.067e-01 -0.235
## interview_age 2.668e-02 1.823e-02 1.463
## MRI_minus_hormone_date_time 4.047e-05 1.641e-05 2.466
## bmi 4.551e-02 3.676e-02 1.238
```

```

## household.income[>=200K] -2.409e+00 9.972e-01 -2.416
## household.income[100K-200K] -1.508e+00 9.271e-01 -1.627
## household.income[12K-16K] -2.799e-01 1.160e+00 -0.241
## household.income[16K-25K] -1.362e+00 1.066e+00 -1.278
## household.income[25K-35K] 9.007e-02 9.684e-01 0.093
## household.income[35K-50K] -9.729e-01 9.485e-01 -1.026
## household.income[50K-75K] -1.269e+00 9.346e-01 -1.358
## household.income[5K-12K] -4.818e-01 1.130e+00 -0.426
## household.income[75K-100K] -1.301e+00 9.379e-01 -1.387
## high.educBachelor 2.732e-01 8.825e-01 0.310
## high.educHS Diploma/GED -8.317e-02 8.955e-01 -0.093
## high.educPost Graduate Degree 6.473e-01 8.958e-01 0.723
## high.educSome College 7.895e-01 8.304e-01 0.951
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -7.443e-03 8.916e-03 -0.835
## Pr(>|t|)
## (Intercept) 0.7694
## PDS_score 3.09e-05 ***
## hormone_sal_end_min_since_midnight 0.9839
## hormone_scr_ert_mean 0.6163
## putamen_posvsneg_feedback_z 0.7150
## race.ethnicity.5levelBlack 0.4336
## race.ethnicity.5levelMixed 0.2977
## race.ethnicity.5levelOther 0.5504
## race.ethnicity.5levelWhite 0.0626 .
## demo_race_hispanic1 0.8142
## interview_age 0.1436
## MRI_minus_hormone_date_time 0.0138 *
## bmi 0.2158
## household.income[>=200K] 0.0158 *
## household.income[100K-200K] 0.1040
## household.income[12K-16K] 0.8093
## household.income[16K-25K] 0.2013
## household.income[25K-35K] 0.9259
## household.income[35K-50K] 0.3052
## household.income[50K-75K] 0.1746
## household.income[5K-12K] 0.6699
## household.income[75K-100K] 0.1655
## high.educBachelor 0.7569
## high.educHS Diploma/GED 0.9260
## high.educPost Graduate Degree 0.4701
## high.educSome College 0.3419
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z 0.4040
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0304
## lmer.REML = 10266 Scale est. = 16.538 n = 1670

```

## Males

```

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

```

```

## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_sal_end_min_since_midnight +
##     hormone_scr_ert_mean * putamen_posvsneg_feedback_z + race.ethnicity.5level +
##     demo_race_hispanic + interview_age + MRI_minus_hormone_date_time +
##     bmi + household.income + high.educ
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      2.879e+00  2.710e+00   1.062
## PDS_score         7.523e-01  2.813e-01   2.674
## hormone_sal_end_min_since_midnight  8.810e-04  8.083e-04   1.090
## hormone_scr_ert_mean  5.409e-03  9.363e-03   0.578
## putamen_posvsneg_feedback_z  1.389e-01  3.389e-01   0.410
## race.ethnicity.5levelBlack  1.278e-01  1.130e+00   0.113
## race.ethnicity.5levelMixed  1.330e+00  1.100e+00   1.210
## race.ethnicity.5levelOther  4.885e-01  1.237e+00   0.395
## race.ethnicity.5levelWhite  1.458e+00  1.037e+00   1.406
## demo_race_hispanic1  1.964e-02  4.228e-01   0.046
## interview_age      2.889e-03  1.763e-02   0.164
## MRI_minus_hormone_date_time  1.872e-05  1.821e-05   1.028
## bmi                1.284e-02  3.787e-02   0.339
## household.income[>=200K] -3.060e+00  1.033e+00 -2.961
## household.income[100K-200K] -2.674e+00  9.766e-01 -2.738
## household.income[12K-16K]  -4.563e-01  1.253e+00 -0.364
## household.income[16K-25K]   3.242e-01  1.079e+00  0.301
## household.income[25K-35K]  -7.384e-01  1.059e+00 -0.697
## household.income[35K-50K]  -6.642e-01  1.026e+00 -0.647
## household.income[50K-75K]  -1.992e+00  9.744e-01 -2.044
## household.income[5K-12K]   -6.026e-02  1.131e+00 -0.053
## household.income[75K-100K] -2.649e+00  9.944e-01 -2.664
## high.educBachelor          1.111e+00  9.731e-01  1.141
## high.educHS Diploma/GED   -1.193e+00  1.007e+00 -1.184
## high.educPost Graduate Degree  3.014e-01  9.759e-01  0.309
## high.educSome College      6.385e-01  9.289e-01  0.687
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -1.565e-03  1.009e-02 -0.155
##
##               Pr(>|t|)
## (Intercept)      0.28822
## PDS_score         0.00757 **
## hormone_sal_end_min_since_midnight  0.27590
## hormone_scr_ert_mean  0.56352
## putamen_posvsneg_feedback_z  0.68200
## race.ethnicity.5levelBlack  0.90993
## race.ethnicity.5levelMixed  0.22656
## race.ethnicity.5levelOther  0.69307
## race.ethnicity.5levelWhite  0.15996
## demo_race_hispanic1  0.96296
## interview_age      0.86988
## MRI_minus_hormone_date_time  0.30393
## bmi                0.73455
## household.income[>=200K]  0.00311 **
## household.income[100K-200K] 0.00625 **

```

```
## household.income[12K-16K] 0.71585
## household.income[16K-25K] 0.76378
## household.income[25K-35K] 0.48559
## household.income[35K-50K] 0.51770
## household.income[50K-75K] 0.04111 *
## household.income[5K-12K] 0.95753
## household.income[75K-100K] 0.00779 **
## high.educBachelor 0.25393
## high.educHS Diploma/GED 0.23650
## high.educPost Graduate Degree 0.75745
## high.educSome College 0.49196
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z 0.87677
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0343
## lmer.REML = 10500 Scale est. = 12.687 n = 1689
```

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

##### Females

```
## 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_rvs_n_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)   -3.576e-01 2.632e+00  -0.136 0.891931
## PDS_score      7.860e-01 2.081e-01   3.777 0.000165 ***
## hormone_sal_end_min_since_midnight -1.128e-04 8.038e-04  -0.140 0.888419
## hormone_scr_ert_mean -4.293e-03 8.278e-03  -0.519 0.604115
## lOFC_rvs_n_ant_z  6.104e-01 5.218e-01   1.170 0.242248
## race.ethnicity.5levelBlack -7.362e-01 9.112e-01  -0.808 0.419225
## race.ethnicity.5levelMixed  9.211e-01 8.745e-01   1.053 0.292372
## race.ethnicity.5levelOther -4.026e-01 1.057e+00  -0.381 0.703414
## race.ethnicity.5levelWhite  1.486e+00 8.081e-01   1.838 0.066195 .
## demo_race_hispanic1 -2.115e-01 4.071e-01  -0.520 0.603430
## interview_age    2.787e-02 1.833e-02   1.520 0.128701
## MRI_minus_hormone_date_time  4.028e-05 1.649e-05   2.443 0.014667 *
## bmi             5.615e-02 3.685e-02   1.524 0.127799
## household.income[>=200K] -2.815e+00 1.006e+00  -2.797 0.005211 **
## household.income[100K-200K] -1.934e+00 9.363e-01  -2.065 0.039040 *
## household.income[12K-16K] -6.029e-01 1.170e+00  -0.515 0.606359
```

```
## household.income[16K-25K] -1.797e+00 1.074e+00 -1.673 0.094437 .
## household.income[25K-35K] -3.892e-01 9.778e-01 -0.398 0.690686
## household.income[35K-50K] -1.382e+00 9.568e-01 -1.444 0.148919
## household.income[50K-75K] -1.667e+00 9.413e-01 -1.771 0.076733 .
## household.income[5K-12K] -8.864e-01 1.141e+00 -0.777 0.437233
## household.income[75K-100K] -1.696e+00 9.467e-01 -1.791 0.073468 .
## high.educBachelor 1.784e-01 8.990e-01 0.198 0.842708
## high.educHS Diploma/GED -1.461e-01 9.125e-01 -0.160 0.872835
## high.educPost Graduate Degree 6.039e-01 9.139e-01 0.661 0.508835
## high.educSome College 7.079e-01 8.470e-01 0.836 0.403433
## hormone_scr_ert_mean:l0FC_rvs_n_ant_z -9.843e-03 1.361e-02 -0.723 0.469561
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0294
## lmer.REML = 10216 Scale est. = 15.996 n = 1661
```

## Males

```
## 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 * l0FC_rvs_n_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) 2.153e+00 2.683e+00 0.802 0.4225
## PDS_score 7.038e-01 2.835e-01 2.483 0.0131 *
## hormone_sal_end_min_since_midnight 6.258e-04 8.082e-04 0.774 0.4389
## hormone_scr_ert_mean 8.209e-03 9.252e-03 0.887 0.3750
## l0FC_rvs_n_ant_z 3.036e-01 4.810e-01 0.631 0.5280
## race.ethnicity.5levelBlack 3.257e-02 1.138e+00 0.029 0.9772
## race.ethnicity.5levelMixed 1.294e+00 1.105e+00 1.171 0.2419
## race.ethnicity.5levelOther 5.329e-01 1.238e+00 0.430 0.6670
## race.ethnicity.5levelWhite 1.437e+00 1.043e+00 1.379 0.1682
## demo_race_hispanic1 1.181e-02 4.245e-01 0.028 0.9778
## interview_age 7.332e-03 1.746e-02 0.420 0.6746
## MRI_minus_hormone_date_time 2.214e-05 1.864e-05 1.188 0.2349
## bmi 2.609e-03 3.761e-02 0.069 0.9447
## household.income[>=200K] -2.423e+00 1.042e+00 -2.324 0.0202 *
## household.income[100K-200K] -1.999e+00 9.879e-01 -2.023 0.0432 *
## household.income[12K-16K] 1.545e-01 1.278e+00 0.121 0.9038
## household.income[16K-25K] 1.056e+00 1.085e+00 0.974 0.3304
## household.income[25K-35K] -1.815e-01 1.065e+00 -0.170 0.8647
## household.income[35K-50K] -8.433e-02 1.035e+00 -0.081 0.9351
## household.income[50K-75K] -1.451e+00 9.862e-01 -1.471 0.1415
```

```
## household.income[5K-12K]          6.733e-01  1.135e+00  0.593  0.5530
## household.income[75K-100K]       -2.071e+00  1.005e+00 -2.060  0.0395 *
## high.educBachelor                1.081e+00  9.526e-01  1.135  0.2565
## high.educHS Diploma/GED         -1.063e+00  9.922e-01 -1.071  0.2841
## high.educPost Graduate Degree     2.050e-01  9.554e-01  0.215  0.8301
## high.educSome College             5.604e-01  9.100e-01  0.616  0.5381
## hormone_scr_ert_mean:lOFC_rvs_n_ant_z -1.398e-02  1.308e-02 -1.069  0.2854
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.037
## lmer.REML = 10406  Scale est. = 11.833    n = 1682
```

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

##### Females

```
## 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_rvs_n_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)   -5.152e-01  2.631e+00  -0.196  0.844796
## PDS_score       7.833e-01  2.083e-01   3.760  0.000176 ***
## hormone_sal_end_min_since_midnight -1.243e-04  8.037e-04  -0.155  0.877142
## hormone_scr_ert_mean -3.450e-03  8.260e-03  -0.418  0.676204
## mOFC_rvs_n_ant_z  5.145e-01  4.421e-01   1.164  0.244700
## race.ethnicity.5levelBlack -7.166e-01  9.106e-01  -0.787  0.431409
## race.ethnicity.5levelMixed  8.955e-01  8.751e-01   1.023  0.306322
## race.ethnicity.5levelOther -4.112e-01  1.056e+00  -0.390  0.696916
## race.ethnicity.5levelWhite  1.512e+00  8.080e-01   1.871  0.061506 .
## demo_race_hispanic1 -2.349e-01  4.073e-01  -0.577  0.564241
## interview_age    2.814e-02  1.835e-02   1.533  0.125465
## MRI_minus_hormone_date_time  3.977e-05  1.648e-05   2.413  0.015912 *
## bmi             5.756e-02  3.685e-02   1.562  0.118485
## household.income[>=200K] -2.924e+00  1.006e+00  -2.905  0.003719 **
## household.income[100K-200K] -1.954e+00  9.363e-01  -2.087  0.037036 *
## household.income[12K-16K]   -7.172e-01  1.163e+00  -0.617  0.537600
## household.income[16K-25K]  -1.792e+00  1.073e+00  -1.670  0.095061 .
## household.income[25K-35K]  -3.777e-01  9.745e-01  -0.388  0.698376
## household.income[35K-50K]  -1.436e+00  9.568e-01  -1.501  0.133618
## household.income[50K-75K]  -1.705e+00  9.411e-01  -1.812  0.070152 .
## household.income[5K-12K]   -9.008e-01  1.141e+00  -0.790  0.429911
```

```
## household.income[75K-100K]          -1.735e+00  9.465e-01  -1.832  0.067062 .
## high.educBachelor                   3.065e-01  8.933e-01   0.343  0.731563
## high.educHS Diploma/GED            -2.041e-02  9.045e-01  -0.023  0.981997
## high.educPost Graduate Degree       7.162e-01  9.087e-01   0.788  0.430681
## high.educSome College               7.948e-01  8.405e-01   0.946  0.344476
## hormone_scr_ert_mean:mOFC_rvsn_ant_z -7.698e-03  1.118e-02  -0.689  0.491147
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0299
## lmer.REML = 10216  Scale est. = 15.823    n = 1661
```

## Males

```
## 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)    2.522e+00  2.693e+00   0.937  0.34905
## PDS_score       7.781e-01  2.836e-01   2.744  0.00613 **
## hormone_sal_end_min_since_midnight  4.793e-04  8.088e-04   0.593  0.55353
## hormone_scr_ert_mean  7.646e-03  9.325e-03   0.820  0.41235
## mOFC_rvsn_ant_z  -7.050e-02  4.172e-01  -0.169  0.86583
## race.ethnicity.5levelBlack  1.507e-01  1.145e+00   0.132  0.89527
## race.ethnicity.5levelMixed  1.265e+00  1.110e+00   1.139  0.25474
## race.ethnicity.5levelOther  5.754e-01  1.247e+00   0.462  0.64449
## race.ethnicity.5levelWhite  1.459e+00  1.049e+00   1.391  0.16444
## demo_race_hispanic1  -7.490e-03  4.255e-01  -0.018  0.98596
## interview_age     8.085e-03  1.754e-02   0.461  0.64497
## MRI_minus_hormone_date_time  2.091e-05  1.865e-05   1.121  0.26247
## bmi              4.234e-03  3.775e-02   0.112  0.91071
## household.income[>=200K]  -3.038e+00  1.035e+00  -2.936  0.00337 **
## household.income[100K-200K] -2.657e+00  9.791e-01  -2.714  0.00672 **
## household.income[12K-16K]  -4.961e-01  1.253e+00  -0.396  0.69228
## household.income[16K-25K]   3.392e-01  1.075e+00   0.315  0.75244
## household.income[25K-35K]  -9.388e-01  1.058e+00  -0.887  0.37503
## household.income[35K-50K]  -6.748e-01  1.028e+00  -0.657  0.51156
## household.income[50K-75K]  -2.109e+00  9.758e-01  -2.161  0.03080 *
## household.income[5K-12K]    4.686e-02  1.129e+00   0.042  0.96689
## household.income[75K-100K] -2.677e+00  9.966e-01  -2.686  0.00730 **
## high.educBachelor    1.212e+00  9.566e-01   1.267  0.20529
## high.educHS Diploma/GED  -1.061e+00  9.938e-01  -1.068  0.28567
## high.educPost Graduate Degree  3.777e-01  9.593e-01   0.394  0.69384
```



```
## high.educSome College          7.714e-01  9.121e-01   0.846  0.39779
## hormone_scr_ert_mean:mOFC_rvsnt_z -4.307e-03  1.176e-02  -0.366  0.71426
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0359
## lmer.REML = 10465  Scale est. = 11.76      n = 1688
```

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

### Females

```
## 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)    -6.786e-01  2.622e+00  -0.259
## PDS_score       7.605e-01  2.078e-01   3.661
## hormone_sal_end_min_since_midnight -1.261e-04  8.027e-04  -0.157
## hormone_scr_ert_mean -3.526e-03  8.277e-03  -0.426
## lOFC_posvsneg_feedback_z  7.349e-02  5.803e-01   0.127
## race.ethnicity.5levelBlack -6.927e-01  9.109e-01  -0.760
## race.ethnicity.5levelMixed  9.582e-01  8.729e-01   1.098
## race.ethnicity.5levelOther -6.081e-01  1.056e+00  -0.576
## race.ethnicity.5levelWhite  1.471e+00  8.068e-01   1.824
## demo_race_hispanic1 -2.006e-01  4.089e-01  -0.490
## interview_age  2.929e-02  1.833e-02   1.598
## MRI_minus_hormone_date_time  4.161e-05  1.646e-05   2.528
## bmi  5.384e-02  3.675e-02   1.465
## household.income[>=200K] -2.683e+00  9.934e-01  -2.701
## household.income[100K-200K] -1.750e+00  9.228e-01  -1.897
## household.income[12K-16K] -5.499e-01  1.157e+00  -0.475
## household.income[16K-25K] -1.625e+00  1.061e+00  -1.531
## household.income[25K-35K] -1.229e-01  9.647e-01  -0.127
## household.income[35K-50K] -1.140e+00  9.448e-01  -1.206
## household.income[50K-75K] -1.490e+00  9.291e-01  -1.604
## household.income[5K-12K] -9.107e-01  1.131e+00  -0.805
## household.income[75K-100K] -1.536e+00  9.334e-01  -1.646
## high.educBachelor  2.144e-01  8.760e-01   0.245
## high.educHS Diploma/GED  3.681e-02  8.911e-01   0.041
## high.educPost Graduate Degree  6.310e-01  8.909e-01   0.708
## high.educSome College  7.253e-01  8.248e-01   0.879
```

```
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z -1.863e-03 1.539e-02 -0.121
## Pr(>|t|)
## (Intercept) 0.79578
## PDS_score 0.00026 ***
## hormone_sal_end_min_since_midnight 0.87517
## hormone_scr_ert_mean 0.67015
## lOFC_posvsneg_feedback_z 0.89924
## race.ethnicity.5levelBlack 0.44708
## race.ethnicity.5levelMixed 0.27247
## race.ethnicity.5levelOther 0.56467
## race.ethnicity.5levelWhite 0.06837 .
## demo_race_hispanic1 0.62386
## interview_age 0.11017
## MRI_minus_hormone_date_time 0.01156 *
## bmi 0.14310
## household.income[>=200K] 0.00699 **
## household.income[100K-200K] 0.05806 .
## household.income[12K-16K] 0.63451
## household.income[16K-25K] 0.12592
## household.income[25K-35K] 0.89867
## household.income[35K-50K] 0.22790
## household.income[50K-75K] 0.10884
## household.income[5K-12K] 0.42097
## household.income[75K-100K] 0.10004
## high.educBachelor 0.80668
## high.educHS Diploma/GED 0.96706
## high.educPost Graduate Degree 0.47892
## high.educSome College 0.37931
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z 0.90367
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0273
## lmer.REML = 10243 Scale est. = 16.292 n = 1666
```

## Males

```
## 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) 2.611e+00 2.690e+00 0.971
## PDS_score 7.359e-01 2.834e-01 2.597
```

## hormone_sal_end_min_since_midnight	7.077e-04	8.097e-04	0.874
## hormone_scr_ert_mean	6.805e-03	9.290e-03	0.732
## l0FC_posvsneg_feedback_z	1.458e-01	5.366e-01	0.272
## race.ethnicity.5levelBlack	7.510e-02	1.140e+00	0.066
## race.ethnicity.5levelMixed	1.322e+00	1.110e+00	1.190
## race.ethnicity.5levelOther	4.538e-01	1.244e+00	0.365
## race.ethnicity.5levelWhite	1.481e+00	1.048e+00	1.413
## demo_race_hispanic1	6.928e-02	4.261e-01	0.163
## interview_age	3.230e-03	1.754e-02	0.184
## MRI_minus_hormone_date_time	2.169e-05	1.819e-05	1.192
## bmi	1.259e-02	3.787e-02	0.332
## household.income[>=200K]	-2.829e+00	1.070e+00	-2.644
## household.income[100K-200K]	-2.432e+00	1.016e+00	-2.393
## household.income[12K-16K]	-3.800e-01	1.289e+00	-0.295
## household.income[16K-25K]	7.200e-01	1.120e+00	0.643
## household.income[25K-35K]	-8.232e-01	1.098e+00	-0.750
## household.income[35K-50K]	-5.240e-01	1.063e+00	-0.493
## household.income[50K-75K]	-1.815e+00	1.015e+00	-1.788
## household.income[5K-12K]	5.079e-01	1.153e+00	0.441
## household.income[75K-100K]	-2.468e+00	1.033e+00	-2.389
## high.educBachelor	1.216e+00	9.686e-01	1.255
## high.educHS Diploma/GED	-8.353e-01	1.002e+00	-0.834
## high.educPost Graduate Degree	3.880e-01	9.711e-01	0.400
## high.educSome College	7.799e-01	9.251e-01	0.843
## hormone_scr_ert_mean:l0FC_posvsneg_feedback_z	-1.843e-03	1.510e-02	-0.122
##	Pr(> t )		
## (Intercept)	0.33183		
## PDS_score	0.00950	**	
## hormone_sal_end_min_since_midnight	0.38219		
## hormone_scr_ert_mean	0.46397		
## l0FC_posvsneg_feedback_z	0.78590		
## race.ethnicity.5levelBlack	0.94749		
## race.ethnicity.5levelMixed	0.23413		
## race.ethnicity.5levelOther	0.71523		
## race.ethnicity.5levelWhite	0.15788		
## demo_race_hispanic1	0.87087		
## interview_age	0.85392		
## MRI_minus_hormone_date_time	0.23335		
## bmi	0.73967		
## household.income[>=200K]	0.00827	**	
## household.income[100K-200K]	0.01681	*	
## household.income[12K-16K]	0.76812		
## household.income[16K-25K]	0.52039		
## household.income[25K-35K]	0.45356		
## household.income[35K-50K]	0.62194		
## household.income[50K-75K]	0.07391	.	
## household.income[5K-12K]	0.65952		
## household.income[75K-100K]	0.01702	*	
## high.educBachelor	0.20948		
## high.educHS Diploma/GED	0.40448		
## high.educPost Graduate Degree	0.68957		
## high.educSome College	0.39934		
## hormone_scr_ert_mean:l0FC_posvsneg_feedback_z	0.90287		
## ---			

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0355
## lmer.REML = 10403  Scale est. = 11.792    n = 1679
```

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

##### Females

```
## 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)    -6.142e-01  2.617e+00  -0.235
## PDS_score       7.911e-01  2.069e-01   3.824
## hormone_sal_end_min_since_midnight -5.056e-05  8.017e-04  -0.063
## hormone_scr_ert_mean -3.903e-03  8.260e-03  -0.472
## mOFC_posvsneg_feedback_z  3.936e-01  5.025e-01   0.783
## race.ethnicity.5levelBlack -6.661e-01  9.109e-01  -0.731
## race.ethnicity.5levelMixed  9.851e-01  8.728e-01   1.129
## race.ethnicity.5levelOther -5.960e-01  1.056e+00  -0.564
## race.ethnicity.5levelWhite  1.503e+00  8.072e-01   1.861
## demo_race_hispanic1 -2.092e-01  4.078e-01  -0.513
## interview_age    2.728e-02  1.827e-02   1.493
## MRI_minus_hormone_date_time  4.078e-05  1.643e-05   2.482
## bmi             5.696e-02  3.668e-02   1.553
## household.income[>=200K] -2.661e+00  9.925e-01  -2.681
## household.income[100K-200K] -1.704e+00  9.215e-01  -1.849
## household.income[12K-16K] -5.174e-01  1.154e+00  -0.448
## household.income[16K-25K] -1.642e+00  1.061e+00  -1.549
## household.income[25K-35K] -1.177e-01  9.637e-01  -0.122
## household.income[35K-50K] -1.178e+00  9.428e-01  -1.249
## household.income[50K-75K] -1.469e+00  9.280e-01  -1.583
## household.income[5K-12K] -9.146e-01  1.131e+00  -0.809
## household.income[75K-100K] -1.525e+00  9.331e-01  -1.635
## high.educBachelor  1.956e-01  8.755e-01   0.223
## high.educHS Diploma/GED  1.015e-02  8.910e-01   0.011
## high.educPost Graduate Degree  6.173e-01  8.906e-01   0.693
## high.educSome College  7.275e-01  8.244e-01   0.883
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z -4.174e-03  1.327e-02  -0.315
##
##               Pr(>|t|)
## (Intercept)    0.814439
```

```

## PDS_score 0.000136 ***
## hormone_sal_end_min_since_midnight 0.949727
## hormone_scr_ert_mean 0.636645
## mOFC_posvsneg_feedback_z 0.433582
## race.ethnicity.5levelBlack 0.464763
## race.ethnicity.5levelMixed 0.259182
## race.ethnicity.5levelOther 0.572527
## race.ethnicity.5levelWhite 0.062876 .
## demo_race_hispanic1 0.607953
## interview_age 0.135541
## MRI_minus_hormone_date_time 0.013168 *
## bmi 0.120659
## household.income[>=200K] 0.007420 **
## household.income[100K-200K] 0.064593 .
## household.income[12K-16K] 0.653978
## household.income[16K-25K] 0.121655
## household.income[25K-35K] 0.902848
## household.income[35K-50K] 0.211811
## household.income[50K-75K] 0.113684
## household.income[5K-12K] 0.418873
## household.income[75K-100K] 0.102275
## high.educBachelor 0.823204
## high.educHS Diploma/GED 0.990915
## high.educPost Graduate Degree 0.488311
## high.educSome College 0.377611
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z 0.753118
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.029
## lmer.REML = 10273  Scale est. = 16.096    n = 1671

```

## Males

```

## 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)  2.511e+00  2.678e+00   0.938
## PDS_score    7.417e-01  2.823e-01   2.627
## hormone_sal_end_min_since_midnight 7.106e-04  8.063e-04   0.881
## hormone_scr_ert_mean 8.016e-03  9.279e-03   0.864
## mOFC_posvsneg_feedback_z -5.348e-01  4.493e-01  -1.190

```

```

## race.ethnicity.5levelBlack      -2.489e-02  1.136e+00 -0.022
## race.ethnicity.5levelMixed      1.320e+00  1.107e+00  1.193
## race.ethnicity.5levelOther      4.460e-01  1.239e+00  0.360
## race.ethnicity.5levelWhite      1.468e+00  1.045e+00  1.405
## demo_race_hispanic1            4.966e-02  4.228e-01  0.117
## interview_age                   4.272e-03  1.747e-02  0.244
## MRI_minus_hormone_date_time     2.144e-05  1.865e-05  1.150
## bmi                             1.332e-02  3.770e-02  0.353
## household.income[>=200K]        -2.908e+00  1.060e+00 -2.742
## household.income[100K-200K]     -2.492e+00  1.006e+00 -2.477
## household.income[12K-16K]       -3.503e-01  1.270e+00 -0.276
## household.income[16K-25K]        6.461e-01  1.099e+00  0.588
## household.income[25K-35K]       -8.751e-01  1.088e+00 -0.804
## household.income[35K-50K]       -5.765e-01  1.053e+00 -0.547
## household.income[50K-75K]       -1.851e+00  1.004e+00 -1.844
## household.income[5K-12K]         4.640e-01  1.143e+00  0.406
## household.income[75K-100K]      -2.518e+00  1.023e+00 -2.461
## high.educBachelor               1.205e+00  9.580e-01  1.258
## high.educHS Diploma/GED        -8.462e-01  9.896e-01 -0.855
## high.educPost Graduate Degree    3.971e-01  9.605e-01  0.413
## high.educSome College            7.853e-01  9.137e-01  0.859
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z 1.348e-02  1.269e-02  1.062
##                                Pr(>|t|)
## (Intercept)                     0.34859
## PDS_score                        0.00868 **
## hormone_sal_end_min_since_midnight 0.37832
## hormone_scr_ert_mean             0.38774
## mOFC_posvsneg_feedback_z         0.23403
## race.ethnicity.5levelBlack       0.98252
## race.ethnicity.5levelMixed       0.23298
## race.ethnicity.5levelOther       0.71888
## race.ethnicity.5levelWhite       0.16025
## demo_race_hispanic1              0.90650
## interview_age                    0.80688
## MRI_minus_hormone_date_time      0.25043
## bmi                              0.72392
## household.income[>=200K]          0.00616 **
## household.income[100K-200K]      0.01333 *
## household.income[12K-16K]        0.78278
## household.income[16K-25K]        0.55657
## household.income[25K-35K]        0.42149
## household.income[35K-50K]        0.58415
## household.income[50K-75K]        0.06530 .
## household.income[5K-12K]         0.68488
## household.income[75K-100K]       0.01394 *
## high.educBachelor                0.20867
## high.educHS Diploma/GED         0.39262
## high.educPost Graduate Degree    0.67933
## high.educSome College            0.39021
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z 0.28836
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```
## R-sq.(adj) = 0.0364
## lmer.REML = 10436 Scale est. = 11.797 n = 1685
```

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

##### Females

```
##
## 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)    -2.2881141   2.4859836  -0.920 0.357463
## PDS_score        0.6990737   0.1807471   3.868 0.000113
## hormone_sal_end_min_since_midnight 0.0005025   0.0007016   0.716 0.473926
## hormone_scr_ert_mean 0.0355740   0.0271762   1.309 0.190669
## bisbas_ss_basm_rr 0.1145067   0.1128078   1.015 0.310191
## race.ethnicity.5levelBlack -0.8215660   0.8157206  -1.007 0.313968
## race.ethnicity.5levelMixed  1.0382209   0.7917347   1.311 0.189888
## race.ethnicity.5levelOther -0.4027054   0.9344986  -0.431 0.666561
## race.ethnicity.5levelWhite  1.1360019   0.7349889   1.546 0.122347
## demo_race_hispanic1 -0.0254809   0.3617656  -0.070 0.943854
## interview_age    0.0293723   0.0162086   1.812 0.070103
## bmi              0.0467351   0.0324171   1.442 0.149537
## household.income[>=200K] -2.8694103   0.8677004  -3.307 0.000959
## household.income[100K-200K] -1.9970589   0.8044696  -2.482 0.013124
## household.income[12K-16K]  -0.5572779   1.0414608  -0.535 0.592641
## household.income[16K-25K]  -1.4534527   0.8964733  -1.621 0.105099
## household.income[25K-35K]  -0.4815663   0.8406688  -0.573 0.566815
## household.income[35K-50K]  -1.4876909   0.8175625  -1.820 0.068948
## household.income[50K-75K]  -1.5588882   0.8037028  -1.940 0.052554
## household.income[5K-12K]   -0.5648003   0.9240168  -0.611 0.541102
## household.income[75K-100K] -1.7545814   0.8157066  -2.151 0.031587
## high.educBachelor    1.2047441   0.7573489   1.591 0.111815
## high.educHS Diploma/GED  1.1642626   0.7608834   1.530 0.126127
## high.educPost Graduate Degree 1.6518817   0.7718419   2.140 0.032452
## high.educSome College  1.5162082   0.7070525   2.144 0.032112
## hormone_scr_ert_mean:bisbas_ss_basm_rr -0.0045127   0.0029733  -1.518 0.129226
##
## (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) =  0.0253
## lmer.REML = 13484 Scale est. = 17.482 n = 2187
```

## Males

```
##
## 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)	2.9361822	2.4425892	1.202	0.229454
## PDS_score	0.6330724	0.2235903	2.831	0.004674
## hormone_sal_end_min_since_midnight	0.0012221	0.0006813	1.794	0.072980
## hormone_scr_ert_mean	0.0316107	0.0288597	1.095	0.273487
## bisbas_ss_basm_rr	0.0119582	0.1108948	0.108	0.914137
## race.ethnicity.5levelBlack	-0.6400082	0.8939529	-0.716	0.474105
## race.ethnicity.5levelMixed	1.0654701	0.8692779	1.226	0.220436
## race.ethnicity.5levelOther	0.1529120	0.9884501	0.155	0.877072
## race.ethnicity.5levelWhite	1.0379065	0.8171476	1.270	0.204154
## demo_race_hispanic1	-0.0423483	0.3577009	-0.118	0.905769
## interview_age	0.0041823	0.0150166	0.279	0.780646
## bmi	0.0202849	0.0312642	0.649	0.516517
## household.income[>=200K]	-3.2107221	0.8508788	-3.773	0.000165
## household.income[100K-200K]	-2.6504216	0.7962866	-3.328	0.000887
## household.income[12K-16K]	-0.2270083	1.0344246	-0.219	0.826316
## household.income[16K-25K]	-0.1570177	0.8538220	-0.184	0.854108



```

## household.income[25K-35K] -0.7385400 0.8538233 -0.865 0.387138
## household.income[35K-50K] -1.3046091 0.8126758 -1.605 0.108556
## household.income[50K-75K] -1.8208521 0.7872545 -2.313 0.020813
## household.income[5K-12K] -0.1857202 0.8810502 -0.211 0.833066
## household.income[75K-100K] -2.7732703 0.8110737 -3.419 0.000639
## high.educBachelor 1.1885861 0.7954839 1.494 0.135266
## high.educHS Diploma/GED -0.8109329 0.7889599 -1.028 0.304126
## high.educPost Graduate Degree 0.4091689 0.7995941 0.512 0.608894
## high.educSome College 0.7577111 0.7578829 1.000 0.317523
## hormone_scr_ert_mean:bisbas_ss_basm_rr -0.0033120 0.0031515 -1.051 0.293387
##
## (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) = 0.0353
## lmer.REML = 14771 Scale est. = 14.668 n = 2382

```

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

Females

```

##
## 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)      -5.916e-01  2.483e+00  -0.238
## PDS_score          8.877e-01  1.990e-01   4.460
## hormone_sal_end_min_since_midnight -2.705e-05  7.565e-04  -0.036
## hormone_scr_ert_mean -5.649e-03  8.066e-03  -0.700
## rt_diff_large_neutral_z -1.473e-01  3.038e-01  -0.485
## race.ethnicity.5levelBlack -1.092e+00  8.701e-01  -1.255
## race.ethnicity.5levelMixed  5.577e-01  8.378e-01   0.666
## race.ethnicity.5levelOther -7.441e-01  9.840e-01  -0.756
## race.ethnicity.5levelWhite  1.138e+00  7.763e-01   1.466
## demo_race_hispanic1 -1.245e-01  3.891e-01  -0.320
## interview_age      2.927e-02  1.757e-02   1.666
## bmi                4.134e-02  3.479e-02   1.188
## household.income[>=200K] -2.399e+00  9.464e-01  -2.535
## household.income[100K-200K] -1.535e+00  8.795e-01  -1.746
## household.income[12K-16K] -4.214e-01  1.125e+00  -0.374
## household.income[16K-25K] -1.283e+00  9.862e-01  -1.301
## household.income[25K-35K]  1.342e-01  9.171e-01   0.146
## household.income[35K-50K] -9.464e-01  8.920e-01  -1.061
## household.income[50K-75K] -1.318e+00  8.805e-01  -1.497
## household.income[5K-12K] -1.625e-01  1.066e+00  -0.152
## household.income[75K-100K] -1.368e+00  8.932e-01  -1.532
## high.educBachelor  3.142e-01  8.241e-01   0.381
## high.educHS Diploma/GED  3.990e-01  8.371e-01   0.477
## high.educPost Graduate Degree  8.209e-01  8.393e-01   0.978
## high.educSome College  9.385e-01  7.738e-01   1.213
## hormone_scr_ert_mean:rt_diff_large_neutral_z 9.980e-03  7.773e-03   1.284
##
##               Pr(>|t|)
## (Intercept)      0.8117
## PDS_score         8.69e-06 ***
## hormone_sal_end_min_since_midnight  0.9715
## hormone_scr_ert_mean  0.4838
## rt_diff_large_neutral_z  0.6278
## race.ethnicity.5levelBlack  0.2096
## race.ethnicity.5levelMixed  0.5057
## race.ethnicity.5levelOther  0.4496
## race.ethnicity.5levelWhite  0.1428
## demo_race_hispanic1  0.7489
## interview_age      0.0960 .
## bmi                0.2348
## household.income[>=200K]  0.0113 *
## household.income[100K-200K]  0.0810 .
## household.income[12K-16K]  0.7081
## household.income[16K-25K]  0.1934
## household.income[25K-35K]  0.8837
## household.income[35K-50K]  0.2889
## household.income[50K-75K]  0.1345
## household.income[5K-12K]  0.8788

```

```
## household.income[75K-100K]          0.1258
## high.educBachelor                   0.7031
## high.educHS Diploma/GED            0.6337
## high.educPost Graduate Degree       0.3282
## high.educSome College               0.2253
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.1993
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0308
## lmer.REML = 11335 Scale est. = 16.64      n = 1844
```

## Males

```
##
## 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)    1.269e+00  2.535e+00   0.500
## PDS_score      8.296e-01  2.569e-01   3.230
## hormone_sal_end_min_since_midnight 1.202e-03  7.493e-04   1.604
## hormone_scr_ert_mean    7.503e-03  8.668e-03   0.866
## rt_diff_large_neutral_z -6.436e-02  3.066e-01  -0.210
## race.ethnicity.5levelBlack -6.042e-01  1.085e+00  -0.557
## race.ethnicity.5levelMixed  8.183e-01  1.061e+00   0.772
## race.ethnicity.5levelOther -3.453e-02  1.176e+00  -0.029
## race.ethnicity.5levelWhite  9.387e-01  1.002e+00   0.936
## demo_race_hispanic1 -1.581e-02  3.977e-01  -0.040
## interview_age    4.926e-03  1.648e-02   0.299
## bmi             1.955e-02  3.535e-02   0.553
## household.income[>=200K] -2.041e+00  9.747e-01  -2.094
## household.income[100K-200K] -1.685e+00  9.209e-01  -1.829
## household.income[12K-16K]  9.759e-01  1.166e+00   0.837
## household.income[16K-25K]  1.413e+00  1.007e+00   1.404
## household.income[25K-35K]  2.868e-01  9.915e-01   0.289
## household.income[35K-50K]  2.929e-01  9.450e-01   0.310
## household.income[50K-75K] -9.253e-01  9.145e-01  -1.012
## household.income[5K-12K]   9.014e-01  1.042e+00   0.865
## household.income[75K-100K] -1.635e+00  9.368e-01  -1.745
## high.educBachelor    1.492e+00  9.150e-01   1.630
## high.educHS Diploma/GED -7.888e-02  9.279e-01  -0.085
## high.educPost Graduate Degree  7.420e-01  9.159e-01   0.810
## high.educSome College  9.089e-01  8.705e-01   1.044
## hormone_scr_ert_mean:rt_diff_large_neutral_z -4.021e-05  8.588e-03  -0.005
##
## Pr(>|t|)
```

```

## (Intercept) 0.61680
## PDS_score 0.00126 **
## hormone_sal_end_min_since_midnight 0.10890
## hormone_scr_ert_mean 0.38677
## rt_diff_large_neutral_z 0.83374
## race.ethnicity.5levelBlack 0.57773
## race.ethnicity.5levelMixed 0.44045
## race.ethnicity.5levelOther 0.97658
## race.ethnicity.5levelWhite 0.34914
## demo_race_hispanic1 0.96829
## interview_age 0.76503
## bmi 0.58041
## household.income[>=200K] 0.03643 *
## household.income[100K-200K] 0.06751 .
## household.income[12K-16K] 0.40270
## household.income[16K-25K] 0.16059
## household.income[25K-35K] 0.77240
## household.income[35K-50K] 0.75661
## household.income[50K-75K] 0.31177
## household.income[5K-12K] 0.38716
## household.income[75K-100K] 0.08112 .
## high.educBachelor 0.10317
## high.educHS Diploma/GED 0.93227
## high.educPost Graduate Degree 0.41795
## high.educSome College 0.29652
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.99626
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0342
## lmer.REML = 11868 Scale est. = 11.153 n = 1918

```

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

##### Females

```

##
## 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) -5.687e-01 2.483e+00 -0.229
## PDS_score 8.905e-01 1.991e-01 4.473
## hormone_sal_end_min_since_midnight -6.999e-05 7.562e-04 -0.093
## hormone_scr_ert_mean -4.928e-03 8.056e-03 -0.612

```

```

## rt_diff_large_small_z          1.820e-02  2.858e-01  0.064
## race.ethnicity.5levelBlack     -1.067e+00  8.703e-01 -1.226
## race.ethnicity.5levelMixed      5.845e-01  8.383e-01  0.697
## race.ethnicity.5levelOther     -7.186e-01  9.843e-01 -0.730
## race.ethnicity.5levelWhite      1.165e+00  7.762e-01  1.500
## demo_race_hispanic1            -1.503e-01  3.892e-01 -0.386
## interview_age                   2.970e-02  1.756e-02  1.691
## bmi                             3.930e-02  3.482e-02  1.129
## household.income[>=200K]        -2.447e+00  9.467e-01 -2.585
## household.income[100K-200K]     -1.596e+00  8.793e-01 -1.815
## household.income[12K-16K]       -4.373e-01  1.125e+00 -0.389
## household.income[16K-25K]       -1.347e+00  9.865e-01 -1.365
## household.income[25K-35K]        1.189e-01  9.170e-01  0.130
## household.income[35K-50K]       -1.008e+00  8.922e-01 -1.129
## household.income[50K-75K]       -1.370e+00  8.807e-01 -1.555
## household.income[5K-12K]        -1.649e-01  1.067e+00 -0.155
## household.income[75K-100K]      -1.429e+00  8.931e-01 -1.600
## high.educBachelor               3.283e-01  8.241e-01  0.398
## high.educHS Diploma/GED         3.838e-01  8.376e-01  0.458
## high.educPost Graduate Degree    8.203e-01  8.403e-01  0.976
## high.educSome College            9.564e-01  7.742e-01  1.235
## hormone_scr_ert_mean:rt_diff_large_small_z  6.515e-03  7.618e-03  0.855
##                                Pr(>|t|)
## (Intercept)                     0.81887
## PDS_score                        8.17e-06 ***
## hormone_sal_end_min_since_midnight 0.92627
## hormone_scr_ert_mean             0.54076
## rt_diff_large_small_z            0.94922
## race.ethnicity.5levelBlack        0.22021
## race.ethnicity.5levelMixed        0.48575
## race.ethnicity.5levelOther        0.46543
## race.ethnicity.5levelWhite        0.13371
## demo_race_hispanic1               0.69943
## interview_age                     0.09102 .
## bmi                               0.25918
## household.income[>=200K]           0.00982 **
## household.income[100K-200K]        0.06967 .
## household.income[12K-16K]          0.69762
## household.income[16K-25K]          0.17230
## household.income[25K-35K]          0.89683
## household.income[35K-50K]          0.25889
## household.income[50K-75K]          0.12011
## household.income[5K-12K]           0.87718
## household.income[75K-100K]         0.10982
## high.educBachelor                  0.69036
## high.educHS Diploma/GED            0.64686
## high.educPost Graduate Degree       0.32907
## high.educSome College               0.21686
## hormone_scr_ert_mean:rt_diff_large_small_z 0.39255
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0312

```

```
## lmer.REML = 11334 Scale est. = 16.629 n = 1844
```

## Males

```
##
## 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)	1.3294383	2.5328745	0.525
## PDS_score	0.8320804	0.2572010	3.235
## hormone_sal_end_min_since_midnight	0.0011871	0.0007491	1.585
## hormone_scr_ert_mean	0.0074901	0.0086712	0.864
## rt_diff_large_small_z	0.0376750	0.3152954	0.119
## race.ethnicity.5levelBlack	-0.6024476	1.0848947	-0.555
## race.ethnicity.5levelMixed	0.8057005	1.0598366	0.760
## race.ethnicity.5levelOther	-0.0315678	1.1756835	-0.027
## race.ethnicity.5levelWhite	0.9345866	1.0015867	0.933
## demo_race_hispanic1	-0.0131740	0.3980185	-0.033
## interview_age	0.0046234	0.0164597	0.281
## bmi	0.0194357	0.0353483	0.550
## household.income[>=200K]	-2.0502423	0.9746178	-2.104
## household.income[100K-200K]	-1.6957801	0.9214032	-1.840
## household.income[12K-16K]	0.9678014	1.1660630	0.830
## household.income[16K-25K]	1.4038531	1.0085776	1.392
## household.income[25K-35K]	0.2745226	0.9927545	0.277
## household.income[35K-50K]	0.2848239	0.9446810	0.302
## household.income[50K-75K]	-0.9332962	0.9142851	-1.021
## household.income[5K-12K]	0.8982026	1.0423185	0.862
## household.income[75K-100K]	-1.6446442	0.9372595	-1.755
## high.educBachelor	1.4877089	0.9145794	1.627
## high.educHS Diploma/GED	-0.0791811	0.9269201	-0.085
## high.educPost Graduate Degree	0.7434428	0.9155015	0.812
## high.educSome College	0.9080163	0.8695853	1.044
## hormone_scr_ert_mean:rt_diff_large_small_z	-0.0017463	0.0091524	-0.191

```
## Pr(>|t|)
## (Intercept) 0.59973
## PDS_score 0.00124 **
## hormone_sal_end_min_since_midnight 0.11318
## hormone_scr_ert_mean 0.38781
## rt_diff_large_small_z 0.90490
## race.ethnicity.5levelBlack 0.57875
## race.ethnicity.5levelMixed 0.44722
## race.ethnicity.5levelOther 0.97858
## race.ethnicity.5levelWhite 0.35088
## demo_race_hispanic1 0.97360
## interview_age 0.77882
```

```

## bmi                                0.58250
## household.income[>=200K]          0.03554 *
## household.income[100K-200K]       0.06586 .
## household.income[12K-16K]         0.40666
## household.income[16K-25K]         0.16411
## household.income[25K-35K]         0.78217
## household.income[35K-50K]         0.76306
## household.income[50K-75K]         0.30748
## household.income[5K-12K]          0.38894
## household.income[75K-100K]        0.07947 .
## high.educBachelor                 0.10398
## high.educHS Diploma/GED          0.93193
## high.educPost Graduate Degree     0.41686
## high.educSome College             0.29653
## hormone_scr_ert_mean:rt_diff_large_small_z 0.84870
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0342
## lmer.REML = 11868 Scale est. = 11.131    n = 1918

```