

# Supplement A

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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## Results for Sample 1

### 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 + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.364047   1.858610   1.810 0.070413 .
## PDS_score         0.599362   0.157687   3.801 0.000147 ***
## race.ethnicity.5levelBlack 0.135086   0.792591   0.170 0.864681
## race.ethnicity.5levelMixed 1.837143   0.789510   2.327 0.020044 *
## race.ethnicity.5levelOther 2.439633   0.901292   2.707 0.006837 **
## race.ethnicity.5levelWhite 1.354995   0.742020   1.826 0.067950 .
## interview_age     -0.005834   0.014591  -0.400 0.689307
## demo_race_hispanic1 0.216061   0.316107   0.684 0.494348
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0121
## lmer.REML = 16403  Scale est. = 13.201    n = 2640
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + race.ethnicity.5level +
##      interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.2809201   1.7753641   1.285 0.19898
## PDS_score         0.8365766   0.1977954   4.230 2.42e-05 ***
## race.ethnicity.5levelBlack 1.3712129   0.7410409   1.850 0.06436 .
## race.ethnicity.5levelMixed 2.0935551   0.7424989   2.820 0.00484 **
## race.ethnicity.5levelOther 1.9518383   0.8504461   2.295 0.02180 *
## race.ethnicity.5levelWhite 1.5430121   0.6950591   2.220 0.02650 *
## interview_age     -0.0002827   0.0139368  -0.020 0.98382
## demo_race_hispanic1 0.2406567   0.2999262   0.802 0.42240
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00686
## lmer.REML = 17796  Scale est. = 15.403    n = 2863
```

## 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 +
##      demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.738267    1.046826   1.661  0.0969 .
## PDS_score         0.192989    0.088633   2.177  0.0295 *
## race.ethnicity.5levelBlack  0.034518    0.442769   0.078  0.9379
## race.ethnicity.5levelMixed  0.899818    0.441294   2.039  0.0415 *
## race.ethnicity.5levelOther  0.960117    0.504377   1.904  0.0571 .
## race.ethnicity.5levelWhite  0.798545    0.414637   1.926  0.0542 .
## interview_age      -0.002110    0.008232  -0.256  0.7977
## demo_race_hispanic1    0.024025    0.176180   0.136  0.8915
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00724
## lmer.REML = 13376 Scale est. = 4.9862    n = 2640
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ PDS_score + race.ethnicity.5level + interview_age +
##      demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.330887    0.992219   1.341 0.179922
## PDS_score         0.417375    0.110221   3.787 0.000156 ***
## race.ethnicity.5levelBlack  0.617362    0.412907   1.495 0.134983
## race.ethnicity.5levelMixed  1.145515    0.414049   2.767 0.005701 **
## race.ethnicity.5levelOther  1.105289    0.473273   2.335 0.019591 *
## race.ethnicity.5levelWhite  1.049243    0.387670   2.707 0.006839 **
## interview_age      -0.003445    0.007791  -0.442 0.658426
## demo_race_hispanic1    0.095636    0.165991   0.576 0.564557
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00662
## lmer.REML = 14478 Scale est. = 6.4889    n = 2863
```

## 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 + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.560842   0.544323   1.030   0.3029
## PDS_score      0.192902   0.046013   4.192 2.85e-05 ***
## race.ethnicity.5levelBlack 0.185794   0.228387   0.814   0.4160
## race.ethnicity.5levelMixed 0.401589   0.227843   1.763   0.0781 .
## race.ethnicity.5levelOther 0.569861   0.260772   2.185   0.0290 *
## race.ethnicity.5levelWhite 0.218364   0.213975   1.021   0.3076
## interview_age  -0.002093   0.004288  -0.488   0.6254
## demo_race_hispanic1 0.175618   0.090490   1.941   0.0524 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0126
## lmer.REML = 9937.2  Scale est. = 1.6344    n = 2640
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ PDS_score + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.4374992  0.5584173   0.783  0.43342
## PDS_score      0.1834951  0.0623571   2.943  0.00328 **
## race.ethnicity.5levelBlack 0.5724725  0.2315140   2.473  0.01347 *
## race.ethnicity.5levelMixed 0.6113634  0.2333716   2.620  0.00885 **
## race.ethnicity.5levelOther 0.4633966  0.2670815   1.735  0.08284 .
## race.ethnicity.5levelWhite 0.3815731  0.2174408   1.755  0.07939 .
## interview_age  -0.0003452  0.0043968  -0.079  0.93743
## demo_race_hispanic1 0.0289864  0.0888073   0.326  0.74415
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00609
## lmer.REML = 11239  Scale est. = 2.0316    n = 2863
```

### 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 + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.500757   0.632217   0.792 0.428394
## PDS_score         0.191889   0.053684   3.574 0.000357 ***
## race.ethnicity.5levelBlack 0.220848   0.266590   0.828 0.407508
## race.ethnicity.5levelMixed 0.677402   0.266390   2.543 0.011051 *
## race.ethnicity.5levelOther 0.837469   0.304982   2.746 0.006075 **
## race.ethnicity.5levelWhite 0.519547   0.249759   2.080 0.037604 *
## interview_age     -0.001794   0.004979  -0.360 0.718640
## demo_race_hispanic1 0.107590   0.104881   1.026 0.305064
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0102
## lmer.REML = 10738 Scale est. = 1.7625    n = 2640
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ PDS_score + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.492148   0.681833   0.722 0.47048
## PDS_score         0.224419   0.075947   2.955 0.00315 **
## race.ethnicity.5levelBlack 0.494325   0.283505   1.744 0.08133 .
## race.ethnicity.5levelMixed 0.666470   0.284770   2.340 0.01933 *
## race.ethnicity.5levelOther 0.585783   0.325805   1.798 0.07229 .
## race.ethnicity.5levelWhite 0.503771   0.266178   1.893 0.05851 .
## interview_age     0.000558   0.005360   0.104 0.91709
## demo_race_hispanic1 -0.046977   0.112531  -0.417 0.67637
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00221
## lmer.REML = 12347 Scale est. = 2.8477    n = 2863
```

## 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 + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.19492    1.89422   2.215 0.026873 *
## pds_p_ss_categoryEarly  1.04585    0.28906   3.618 0.000302 ***
## pds_p_ss_categoryLate   1.70710    0.71494   2.388 0.017023 *
## pds_p_ss_categoryMid    1.20889    0.27421   4.409 1.08e-05 ***
## race.ethnicity.5levelBlack 0.19295    0.79221   0.244 0.807589
## race.ethnicity.5levelMixed 1.90499    0.78883   2.415 0.015805 *
## race.ethnicity.5levelOther 2.49651    0.89969   2.775 0.005562 **
## race.ethnicity.5levelWhite 1.42253    0.74138   1.919 0.055123 .
## interview_age        -0.01158    0.01481  -0.782 0.434254
## demo_race_hispanic1    0.14868    0.31697   0.469 0.639063
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0143
## lmer.REML = 16394 Scale est. = 13.028    n = 2640
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ pds_p_ss_category + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.790351    1.791324   1.558 0.11941
## pds_p_ss_categoryEarly  0.692142    0.246778   2.805 0.00507 **
## pds_p_ss_categoryLate   0.399464    1.458693   0.274 0.78422
## pds_p_ss_categoryMid    1.178074    0.494928   2.380 0.01736 *
## race.ethnicity.5levelBlack 1.452171    0.742233   1.956 0.05051 .
## race.ethnicity.5levelMixed 2.137389    0.743411   2.875 0.00407 **
## race.ethnicity.5levelOther 1.994357    0.851793   2.341 0.01928 *
## race.ethnicity.5levelWhite 1.580709    0.695941   2.271 0.02320 *
## interview_age          0.002656    0.013927   0.191 0.84879
## demo_race_hispanic1    0.222230    0.301085   0.738 0.46052
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00485
## lmer.REML = 17799 Scale est. = 15.679    n = 2863
```

## 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 + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.915933   1.067993   1.794  0.07293 .
## pds_p_ss_categoryEarly 0.483184   0.163247   2.960  0.00311 **
## pds_p_ss_categoryLate  0.412744   0.403926   1.022  0.30696
## pds_p_ss_categoryMid   0.404799   0.154202   2.625  0.00871 **
## race.ethnicity.5levelBlack 0.084441   0.442742   0.191  0.84876
## race.ethnicity.5levelMixed 0.937872   0.441088   2.126  0.03357 *
## race.ethnicity.5levelOther 0.990706   0.503685   1.967  0.04930 *
## race.ethnicity.5levelWhite 0.830010   0.414449   2.003  0.04531 *
## interview_age      -0.003648   0.008362  -0.436  0.66271
## demo_race_hispanic1  0.006521   0.176760   0.037  0.97058
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00866
## lmer.REML = 13371 Scale est. = 4.9568    n = 2640
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ pds_p_ss_category + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.614082   1.000348   1.614  0.10674
## pds_p_ss_categoryEarly 0.439962   0.137774   3.193  0.00142 **
## pds_p_ss_categoryLate  0.348194   0.816709   0.426  0.66989
## pds_p_ss_categoryMid   0.435000   0.275220   1.581  0.11409
## race.ethnicity.5levelBlack 0.657875   0.413354   1.592  0.11160
## race.ethnicity.5levelMixed 1.172391   0.414333   2.830  0.00469 **
## race.ethnicity.5levelOther 1.138695   0.473780   2.403  0.01631 *
## race.ethnicity.5levelWhite 1.070465   0.387972   2.759  0.00583 **
## interview_age      -0.002383   0.007777  -0.306  0.75929
## demo_race_hispanic1  0.085058   0.166620   0.510  0.60975
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.00522
## lmer.REML = 14480 Scale est. = 6.5751 n = 2863
```

## 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 + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.983908   0.554434   1.775  0.07608 .
## pds_p_ss_categoryEarly 0.254666   0.084977   2.997  0.00275 **
## pds_p_ss_categoryLate  0.905884   0.210356   4.306  1.72e-05 ***
## pds_p_ss_categoryMid   0.374417   0.079913   4.685  2.94e-06 ***
## race.ethnicity.5levelBlack 0.180349   0.227835   0.792  0.42868
## race.ethnicity.5levelMixed 0.414586   0.227277   1.824  0.06824 .
## race.ethnicity.5levelOther 0.568592   0.259949   2.187  0.02881 *
## race.ethnicity.5levelWhite 0.236442   0.213381   1.108  0.26793
## interview_age      -0.005017   0.004349  -1.154  0.24877
## demo_race_hispanic1  0.140478   0.090445   1.553  0.12050
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0172
## lmer.REML = 9927 Scale est. = 1.6132 n = 2640
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ pds_p_ss_category + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.5565464   0.5628504   0.989  0.32284
## pds_p_ss_categoryEarly 0.1336213   0.0780413   1.712  0.08697 .
## pds_p_ss_categoryLate  0.0223448   0.4634322   0.048  0.96155
## pds_p_ss_categoryMid   0.3988227   0.1560753   2.555  0.01066 *
## race.ethnicity.5levelBlack 0.5787781   0.2317015   2.498  0.01255 *
## race.ethnicity.5levelMixed 0.6172272   0.2334494   2.644  0.00824 **
## race.ethnicity.5levelOther 0.4623218   0.2672974   1.730  0.08381 .
```

```
## race.ethnicity.5levelWhite 0.3887382 0.2175459 1.787 0.07406 .
## interview_age 0.0002541 0.0043870 0.058 0.95382
## demo_race_hispanic1 0.0215693 0.0892130 0.242 0.80897
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00556
## lmer.REML = 11240 Scale est. = 2.0434 n = 2863
```

## 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 + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.861575   0.644696   1.336 0.18153
## pds_p_ss_categoryEarly 0.256133   0.098889   2.590 0.00965 **
## pds_p_ss_categoryLate 0.731980   0.244492   2.994 0.00278 **
## pds_p_ss_categoryMid 0.380329   0.093369   4.073 4.77e-05 ***
## race.ethnicity.5levelBlack 0.216245   0.266521   0.811 0.41723
## race.ethnicity.5levelMixed 0.687983   0.266189   2.585 0.00980 **
## race.ethnicity.5levelOther 0.840944   0.304487   2.762 0.00579 **
## race.ethnicity.5levelWhite 0.535046   0.249565   2.144 0.03213 *
## interview_age   -0.004198   0.005054  -0.831 0.40625
## demo_race_hispanic1 0.079854   0.105192   0.759 0.44785
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0122
## lmer.REML = 10734 Scale est. = 1.7498 n = 2640
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ pds_p_ss_category + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.6734292 0.6869407   0.980 0.3270
## pds_p_ss_categoryEarly 0.2219863 0.0948566   2.340 0.0193 *
```

```
## pds_p_ss_categoryLate      -0.0676606  0.5620808  -0.120  0.9042
## pds_p_ss_categoryMid       0.4770340  0.1897216   2.514  0.0120 *
## race.ethnicity.5levelBlack  0.4945426  0.2836059   1.744  0.0813 .
## race.ethnicity.5levelMixed  0.6740106  0.2847557   2.367  0.0180 *
## race.ethnicity.5levelOther  0.5872294  0.3259433   1.802  0.0717 .
## race.ethnicity.5levelWhite  0.5138833  0.2661769   1.931  0.0536 .
## interview_age              0.0008821  0.0053471   0.165  0.8690
## demo_race_hispanic1        -0.0588658  0.1128725  -0.522  0.6020
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00245
## lmer.REML = 12346  Scale est. = 2.8531    n = 2863
```

## 1.9 Model: CBCL internalizing factor ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.777154   1.897510   0.937  0.34907
## hormone_scr_ert_mean  0.005443   0.007058   0.771  0.44066
## race.ethnicity.5levelBlack 0.356154   0.793854   0.449  0.65373
## race.ethnicity.5levelMixed 1.827132   0.793913   2.301  0.02145 *
## race.ethnicity.5levelOther 2.642245   0.908951   2.907  0.00368 **
## race.ethnicity.5levelWhite 1.441831   0.745211   1.935  0.05313 .
## interview_age     0.013505   0.014891   0.907  0.36452
## demo_race_hispanic1 0.107062   0.326216   0.328  0.74279
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00669
## lmer.REML = 15258  Scale est. = 13.026    n = 2453
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
```

```
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.174379   1.861568   1.168  0.24290
## hormone_scr_ert_mean 0.002705   0.007283   0.371  0.71036
## race.ethnicity.5levelBlack 1.726569   0.770669   2.240  0.02515 *
## race.ethnicity.5levelMixed 2.136632   0.773300   2.763  0.00577 **
## race.ethnicity.5levelOther 1.857803   0.891175   2.085  0.03720 *
## race.ethnicity.5levelWhite 1.581041   0.723588   2.185  0.02898 *
## interview_age      0.008942   0.014652   0.610  0.54171
## demo_race_hispanic1 0.375750   0.312215   1.203  0.22889
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000861
## lmer.REML = 16615  Scale est. = 16.118    n = 2657
```

## 1.10 Model: CBCL Anxious-Depressed ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.183409   1.072832   1.103  0.2701
## hormone_scr_ert_mean 0.004823   0.003988   1.209  0.2266
## race.ethnicity.5levelBlack 0.034266   0.445232   0.077  0.9387
## race.ethnicity.5levelMixed 0.857746   0.445476   1.925  0.0543 .
## race.ethnicity.5levelOther 1.034142   0.510581   2.025  0.0429 *
## race.ethnicity.5levelWhite 0.850951   0.418116   2.035  0.0419 *
## interview_age      0.003577   0.008433   0.424  0.6714
## demo_race_hispanic1 -0.027670   0.182744  -0.151  0.8797
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00676
## lmer.REML = 12461  Scale est. = 4.9188    n = 2453
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
```

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.4218717   1.0392651   1.368  0.17138
## hormone_scr_ert_mean -0.0003565   0.0040628  -0.088  0.93008
## race.ethnicity.5levelBlack  0.8134972   0.4291594   1.896  0.05813 .
## race.ethnicity.5levelMixed  1.1558481   0.4311201   2.681  0.00738 **
## race.ethnicity.5levelOther  1.0635030   0.4957070   2.145  0.03201 *
## race.ethnicity.5levelWhite  1.0366888   0.4034749   2.569  0.01024 *
## interview_age        0.0005892   0.0081758   0.072  0.94256
## demo_race_hispanic1    0.1581214   0.1726363   0.916  0.35979
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00149
## lmer.REML = 13533 Scale est. = 6.9708    n = 2657
```

## 1.11 Model: CBCL Withdrawn-Depressed ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.133412   0.551030   0.242  0.8087
## hormone_scr_ert_mean  0.001354   0.002047   0.661  0.5084
## race.ethnicity.5levelBlack  0.276842   0.226348   1.223  0.2214
## race.ethnicity.5levelMixed  0.433104   0.226779   1.910  0.0563 .
## race.ethnicity.5levelOther  0.595871   0.260391   2.288  0.0222 *
## race.ethnicity.5levelWhite  0.254142   0.212744   1.195  0.2324
## interview_age        0.003477   0.004341   0.801  0.4232
## demo_race_hispanic1    0.143812   0.092509   1.555  0.1202
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00431
## lmer.REML =  9205 Scale est. = 1.635    n = 2453
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
```



```
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.328077   0.576912   0.569   0.56962
## hormone_scr_ert_mean 0.001616   0.002242   0.721   0.47105
## race.ethnicity.5levelBlack 0.677266   0.237103   2.856   0.00432 **
## race.ethnicity.5levelMixed 0.652777   0.239598   2.724   0.00648 **
## race.ethnicity.5levelOther 0.450078   0.275817   1.632   0.10284
## race.ethnicity.5levelWhite 0.416027   0.223112   1.865   0.06234 .
## interview_age      0.001890   0.004552   0.415   0.67798
## demo_race_hispanic1 0.061100   0.091155   0.670   0.50274
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00357
## lmer.REML = 10457 Scale est. = 2.1924    n = 2657
```

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

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.062803   0.644415   0.097   0.92237
## hormone_scr_ert_mean 0.001558   0.002399   0.650   0.51607
## race.ethnicity.5levelBlack 0.289625   0.265904   1.089   0.27617
## race.ethnicity.5levelMixed 0.689545   0.267077   2.582   0.00989 **
## race.ethnicity.5levelOther 0.886527   0.306968   2.888   0.00391 **
## race.ethnicity.5levelWhite 0.552485   0.249976   2.210   0.02719 *
## interview_age      0.003890   0.005076   0.766   0.44361
## demo_race_hispanic1 0.066325   0.107696   0.616   0.53805
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00535
## lmer.REML =  9990 Scale est. = 1.7521    n = 2453
```

### Males

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

```
##      interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.4514186   0.7132208   0.633   0.5268
## hormone_scr_ert_mean 0.0007203   0.0027845   0.259   0.7959
## race.ethnicity.5levelBlack 0.5928270   0.2941411   2.015   0.0440 *
## race.ethnicity.5levelMixed 0.7062827   0.2960744   2.385   0.0171 *
## race.ethnicity.5levelOther 0.5335909   0.3409543   1.565   0.1177
## race.ethnicity.5levelWhite 0.5157093   0.2765090   1.865   0.0623 .
## interview_age      0.0032092   0.0056205   0.571   0.5681
## demo_race_hispanic1 -0.0174978   0.1167357  -0.150   0.8809
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000414
## lmer.REML = 11549  Scale est. = 2.8489    n = 2657
```

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

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + PDS_score +
##      race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.5126736   1.9039529   1.320 0.187054
## hormone_scr_ert_mean -0.0007324   0.0072485  -0.101 0.919525
## PDS_score          0.6083923   0.1697666   3.584 0.000345 ***
## race.ethnicity.5levelBlack -0.0375505   0.7994683  -0.047 0.962542
## race.ethnicity.5levelMixed 1.6444446   0.7935891   2.072 0.038355 *
## race.ethnicity.5levelOther 2.4066014   0.9091006   2.647 0.008167 **
## race.ethnicity.5levelWhite 1.3496082   0.7437925   1.814 0.069724 .
## interview_age      0.0018428   0.0152063   0.121 0.903555
## demo_race_hispanic1  0.0937585   0.3253881   0.288 0.773261
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.011
## lmer.REML = 15247  Scale est. = 12.976    n = 2453
```

#### Males

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

```
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + PDS_score +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.3709776  1.8555190   1.278  0.20143
## hormone_scr_ert_mean -0.0009005  0.0073023  -0.123  0.90187
## PDS_score         0.9529928  0.2113352   4.509 6.78e-06 ***
## race.ethnicity.5levelBlack 1.3538308  0.7724959   1.753  0.07980 .
## race.ethnicity.5levelMixed 2.0452510  0.7708660   2.653  0.00802 **
## race.ethnicity.5levelOther 1.7301231  0.8885748   1.947  0.05163 .
## race.ethnicity.5levelWhite 1.5442637  0.7211488   2.141  0.03233 *
## interview_age      -0.0016688  0.0147908  -0.113  0.91018
## demo_race_hispanic1  0.2976654  0.3118623   0.954  0.33993
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00719
## lmer.REML = 16596 Scale est. = 15.844    n = 2657
```

## 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 + pds_p_ss_category +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.1911880  1.9388316   1.646  0.09991 .
## hormone_scr_ert_mean 0.0004012  0.0071781   0.056  0.95543
## pds_p_ss_categoryEarly 0.9264288  0.2982685   3.106  0.00192 **
## pds_p_ss_categoryLate 1.0992131  0.7741539   1.420  0.15577
## pds_p_ss_categoryMid  1.2225403  0.2890843   4.229 2.43e-05 ***
## race.ethnicity.5levelBlack 0.0056281  0.7994747   0.007  0.99438
## race.ethnicity.5levelMixed 1.6934486  0.7931990   2.135  0.03286 *
## race.ethnicity.5levelOther 2.4769969  0.9078018   2.729  0.00641 **
## race.ethnicity.5levelWhite 1.4036386  0.7433801   1.888  0.05912 .
## interview_age      -0.0024913  0.0154099  -0.162  0.87158
## demo_race_hispanic1  0.0477434  0.3264159   0.146  0.88372
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0123
## lmer.REML = 15239 Scale est. = 12.821    n = 2453
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean + pds_p_ss_category +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.9980644   1.8719038   1.602  0.10936
## hormone_scr_ert_mean 0.0006441   0.0072938   0.088  0.92964
## pds_p_ss_categoryEarly 0.8229022   0.2600052   3.165  0.00157 **
## pds_p_ss_categoryLate 0.8426341   1.5938785   0.529  0.59708
## pds_p_ss_categoryMid 1.2752179   0.5244864   2.431  0.01511 *
## race.ethnicity.5levelBlack 1.4275812   0.7742208   1.844  0.06531 .
## race.ethnicity.5levelMixed 2.0913423   0.7721266   2.709  0.00680 **
## race.ethnicity.5levelOther 1.7921220   0.8903265   2.013  0.04423 *
## race.ethnicity.5levelWhite 1.5885911   0.7222452   2.200  0.02793 *
## interview_age    0.0008531   0.0147952   0.058  0.95403
## demo_race_hispanic1 0.2679471   0.3131870   0.856  0.39232
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00488
## lmer.REML = 16599 Scale est. = 16.155    n = 2657
```

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

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + PDS_score + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.3963972   1.0785158   1.295  0.1955
## hormone_scr_ert_mean 0.0030115   0.0041066   0.733  0.4634
## PDS_score       0.1760253   0.0959901   1.834  0.0668 .
## race.ethnicity.5levelBlack -0.0801965   0.4493329  -0.178  0.8584
## race.ethnicity.5levelMixed 0.8045575   0.4461652   1.803  0.0715 .
## race.ethnicity.5levelOther 0.9650993   0.5116810   1.886  0.0594 .
## race.ethnicity.5levelWhite 0.8238669   0.4181297   1.970  0.0489 *
## interview_age    0.0002133   0.0086250   0.025  0.9803
## demo_race_hispanic1 -0.0314620   0.1826377  -0.172  0.8632
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.0077
## lmer.REML = 12460 Scale est. = 4.9271 n = 2453
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + PDS_score + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.531077   1.036855   1.477  0.1399
## hormone_scr_ert_mean -0.002185   0.004077  -0.536  0.5920
## PDS_score       0.481584   0.117807   4.088 4.48e-05 ***
## race.ethnicity.5levelBlack 0.622626   0.430606   1.446  0.1483
## race.ethnicity.5levelMixed 1.107991   0.430101   2.576  0.0100 *
## race.ethnicity.5levelOther 0.999585   0.494614   2.021  0.0434 *
## race.ethnicity.5levelWhite 1.016581   0.402449   2.526  0.0116 *
## interview_age    -0.004849   0.008263  -0.587  0.5573
## demo_race_hispanic1 0.119342   0.172687   0.691  0.4896
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00668
## lmer.REML = 13519 Scale est. = 6.8724 n = 2657
```

## 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 + pds_p_ss_category +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.508191   1.098965   1.372  0.17007
## hormone_scr_ert_mean 0.003622   0.004068   0.890  0.37332
## pds_p_ss_categoryEarly 0.453347   0.169177   2.680  0.00742 **
## pds_p_ss_categoryLate 0.098787   0.440211   0.224  0.82246
## pds_p_ss_categoryMid 0.398897   0.163385   2.441  0.01470 *
## race.ethnicity.5levelBlack -0.039410   0.449379  -0.088  0.93012
## race.ethnicity.5levelMixed 0.832990   0.445977   1.868  0.06191 .
## race.ethnicity.5levelOther 0.999761   0.510972   1.957  0.05051 .
```

```
## race.ethnicity.5levelWhite  0.849123    0.417941    2.032  0.04229 *
## interview_age               -0.001035    0.008746   -0.118  0.90579
## demo_race_hispanic1        -0.040163    0.183275   -0.219  0.82656
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00886
## lmer.REML = 12456  Scale est. = 4.8884    n = 2453
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean + pds_p_ss_category +
##    race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.856624    1.045330   1.776 0.075829 .
## hormone_scr_ert_mean -0.001367    0.004071  -0.336 0.737038
## pds_p_ss_categoryEarly  0.486662    0.145262   3.350 0.000819 ***
## pds_p_ss_categoryLate   0.596890    0.894166   0.668 0.504486
## pds_p_ss_categoryMid    0.489517    0.291678   1.678 0.093411 .
## race.ethnicity.5levelBlack 0.668549    0.431377   1.550 0.121309
## race.ethnicity.5levelMixed 1.139697    0.430611   2.647 0.008176 **
## race.ethnicity.5levelOther 1.045581    0.495386   2.111 0.034897 *
## race.ethnicity.5levelWhite 1.044481    0.402907   2.592 0.009584 **
## interview_age       -0.003800    0.008257  -0.460 0.645377
## demo_race_hispanic1   0.103756    0.173443   0.598 0.549748
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00481
## lmer.REML = 13522  Scale est. = 6.9729    n = 2657
```

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

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + PDS_score + race.ethnicity.5level +
##    interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.556e-01  5.525e-01   0.644 0.519837
```

```
## hormone_scr_ert_mean      -5.752e-04  2.105e-03  -0.273  0.784659
## PDS_score                 1.833e-01  4.913e-02   3.731  0.000195 ***
## race.ethnicity.5levelBlack 1.587e-01  2.279e-01   0.696  0.486274
## race.ethnicity.5levelMixed 3.788e-01  2.266e-01   1.672  0.094735 .
## race.ethnicity.5levelOther 5.243e-01  2.604e-01   2.013  0.044193 *
## race.ethnicity.5levelWhite 2.268e-01  2.122e-01   1.069  0.285173
## interview_age             -1.613e-05  4.427e-03  -0.004  0.997094
## demo_race_hispanic1       1.384e-01  9.207e-02   1.503  0.132878
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00942
## lmer.REML = 9195.4  Scale est. = 1.6114    n = 2453
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + PDS_score + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3823656  0.5760694   0.664  0.506909
## hormone_scr_ert_mean 0.0007474  0.0022536   0.332  0.740167
## PDS_score       0.2171114  0.0658141   3.299  0.000984 ***
## race.ethnicity.5levelBlack 0.5852792  0.2382952   2.456  0.014109 *
## race.ethnicity.5levelMixed 0.6297226  0.2392506   2.632  0.008536 **
## race.ethnicity.5levelOther 0.4230631  0.2754286   1.536  0.124654
## race.ethnicity.5levelWhite 0.4076924  0.2227011   1.831  0.067262 .
## interview_age    -0.0005751  0.0046044  -0.125  0.900613
## demo_race_hispanic1 0.0408794  0.0911663   0.448  0.653898
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0071
## lmer.REML = 10450  Scale est. = 2.1781    n = 2657
```

## 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 + pds_p_ss_category +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
```

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.686454   0.562795   1.220  0.22269
## hormone_scr_ert_mean -0.000543   0.002084  -0.261  0.79440
## pds_p_ss_categoryEarly  0.223344   0.086901   2.570  0.01023 *
## pds_p_ss_categoryLate   0.686797   0.226687   3.030  0.00247 **
## pds_p_ss_categoryMid    0.353466   0.083518   4.232  2.4e-05 ***
## race.ethnicity.5levelBlack 0.155767   0.227619   0.684  0.49383
## race.ethnicity.5levelMixed 0.389973   0.226276   1.723  0.08494 .
## race.ethnicity.5levelOther 0.529753   0.259864   2.039  0.04160 *
## race.ethnicity.5levelWhite 0.241722   0.211807   1.141  0.25388
## interview_age        -0.002133   0.004488  -0.475  0.63468
## demo_race_hispanic1    0.112749   0.092161   1.223  0.22130
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0118
## lmer.REML = 9191.5  Scale est. = 1.5977    n = 2453
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + pds_p_ss_category +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.5225870   0.5804921   0.900  0.36807
## hormone_scr_ert_mean 0.0010258   0.0022480   0.456  0.64820
## pds_p_ss_categoryEarly 0.1540443   0.0812467   1.896  0.05807 .
## pds_p_ss_categoryLate  0.0556087   0.5010104   0.111  0.91163
## pds_p_ss_categoryMid    0.4616353   0.1633129   2.827  0.00474 **
## race.ethnicity.5levelBlack 0.5880566   0.2386004   2.465  0.01378 *
## race.ethnicity.5levelMixed 0.6328162   0.2393964   2.643  0.00826 **
## race.ethnicity.5levelOther 0.4221566   0.2757194   1.531  0.12586
## race.ethnicity.5levelWhite 0.4137396   0.2228383   1.857  0.06347 .
## interview_age        0.0001025   0.0045979   0.022  0.98221
## demo_race_hispanic1    0.0317665   0.0915884   0.347  0.72874
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00635
## lmer.REML = 10452  Scale est. = 2.1988    n = 2657
```

## 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 + PDS_score +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2843730   0.6470054   0.440  0.66032
## hormone_scr_ert_mean -0.0003191   0.0024663  -0.129  0.89707
## PDS_score         0.1832904   0.0577771   3.172  0.00153 **
## race.ethnicity.5levelBlack 0.1673917   0.2681722   0.624  0.53256
## race.ethnicity.5levelMixed 0.6327813   0.2671638   2.369  0.01794 *
## race.ethnicity.5levelOther 0.8149754   0.3072112   2.653  0.00803 **
## race.ethnicity.5levelWhite 0.5234749   0.2496598   2.097  0.03612 *
## interview_age      0.0003987   0.0051849   0.077  0.93870
## demo_race_hispanic1 0.0621108   0.1074870   0.578  0.56342
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00875
## lmer.REML = 9983.8  Scale est. = 1.7485    n = 2453
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + PDS_score +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.5091340   0.7122854   0.715  0.47480
## hormone_scr_ert_mean -0.0003101   0.0027980  -0.111  0.91177
## PDS_score         0.2664053   0.0812155   3.280  0.00105 **
## race.ethnicity.5levelBlack 0.4850931   0.2955215   1.641  0.10082
## race.ethnicity.5levelMixed 0.6794914   0.2956917   2.298  0.02164 *
## race.ethnicity.5levelOther 0.4986867   0.3405495   1.464  0.14321
## race.ethnicity.5levelWhite 0.5050363   0.2760952   1.829  0.06748 .
## interview_age      0.0002337   0.0056852   0.041  0.96721
## demo_race_hispanic1 -0.0396152   0.1168844  -0.339  0.73469
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00257
## lmer.REML = 11542  Scale est. = 2.8311    n = 2657
```

## 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 + pds_p_ss_category +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.5842775  0.6591968   0.886  0.37552
## hormone_scr_ert_mean -0.0002682  0.0024428  -0.110  0.91259
## pds_p_ss_categoryEarly  0.2207987  0.1019876   2.165  0.03049 *
## pds_p_ss_categoryLate   0.4844084  0.2650177   1.828  0.06770 .
## pds_p_ss_categoryMid    0.3871347  0.0983396   3.937 8.49e-05 ***
## race.ethnicity.5levelBlack 0.1527621  0.2682545   0.569  0.56909
## race.ethnicity.5levelMixed 0.6344235  0.2670693   2.376  0.01760 *
## race.ethnicity.5levelOther 0.8202047  0.3068257   2.673  0.00756 **
## race.ethnicity.5levelWhite 0.5327023  0.2495551   2.135  0.03289 *
## interview_age        -0.0015013  0.0052556  -0.286  0.77516
## demo_race_hispanic1    0.0432026  0.1078722   0.400  0.68882
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0101
## lmer.REML = 9980.8  Scale est. = 1.7325    n = 2453
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + pds_p_ss_category +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.7207506  0.7175297   1.004  0.31523
## hormone_scr_ert_mean -0.0000134  0.0027906  -0.005  0.99617
## pds_p_ss_categoryEarly  0.2567907  0.0999886   2.568  0.01028 *
## pds_p_ss_categoryLate   0.0654564  0.6145153   0.107  0.91518
## pds_p_ss_categoryMid    0.5312572  0.2012644   2.640  0.00835 **
## race.ethnicity.5levelBlack 0.4816105  0.2958099   1.628  0.10362
## race.ethnicity.5levelMixed 0.6851008  0.2957893   2.316  0.02062 *
## race.ethnicity.5levelOther 0.5039559  0.3408333   1.479  0.13937
## race.ethnicity.5levelWhite 0.5155168  0.2761546   1.867  0.06204 .
## interview_age        0.0006121  0.0056775   0.108  0.91416
## demo_race_hispanic1   -0.0546391  0.1172914  -0.466  0.64137
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0025
## lmer.REML = 11541  Scale est. = 2.8236    n = 2657
```

## 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.395004   0.306222   1.290  0.19719
## PDS_score      0.074620   0.027064   2.757  0.00587 **
## interview_age -0.004768   0.002628  -1.814  0.06972 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00449
## lmer.REML = 7547.8  Scale est. = 0.75326    n = 2690
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.151113   0.289140   0.523  0.60127
## PDS_score      0.091019   0.033898   2.685  0.00729 **
## interview_age -0.001715   0.002449  -0.700  0.48382
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00282
## lmer.REML = 8064.5  Scale est. = 0.72377    n = 2913
```

## 2.2 Model : Reaction Time ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.571405   0.316653  -1.805   0.0713 .
## PDS_score    -0.020896   0.028544  -0.732   0.4642
## interview_age  0.005458   0.002729   2.000   0.0456 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00104
## lmer.REML = 5939.4  Scale est. = 0.67983    n = 2201
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.347747   0.318216  -1.093   0.275
## PDS_score    -0.026961   0.028607  -0.942   0.346
## interview_age  0.003429   0.002742   1.250   0.211
##
##
## R-sq.(adj) =  0.000134
## lmer.REML = 5963.6  Scale est. = 0.77204    n = 2201
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.1377074  0.2925250   0.471   0.6379
## PDS_score    -0.0677145  0.0353646  -1.915   0.0556 .
## interview_age -0.0004923  0.0024809  -0.198   0.8427
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.00137
## lmer.REML = 5951.9 Scale est. = 0.66838 n = 2303

##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0768939  0.2956572   0.260   0.795
## PDS_score    -0.0336634  0.0356570  -0.944   0.345
## interview_age -0.0002174  0.0025086  -0.087   0.931
##
##
## R-sq.(adj) = -0.000241
## lmer.REML = 6019.1 Scale est. = 0.70251 n = 2303
```

## 2.3 Model: Caudate Anticipation ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.483420  0.318838  -1.516   0.1296
## PDS_score    -0.049471  0.028595  -1.730   0.0838 .
## interview_age  0.004869  0.002743   1.775   0.0760 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00193
## lmer.REML = 5350.3 Scale est. = 0.77536 n = 2044
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
```

```
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.209124  0.340919  -0.613   0.540
## PDS_score   -0.003916  0.041426  -0.095   0.925
## interview_age 0.001764  0.002892   0.610   0.542
##
##
## R-sq.(adj) = -0.000702
## lmer.REML = 5743.7  Scale est. = 0.74176  n = 2067
```

## 2.4 Model B: Putamen Anticipation ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsnt_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.372726  0.310423  -1.201  0.23001
## PDS_score    -0.077949  0.027849  -2.799  0.00517 **
## interview_age  0.004245  0.002670   1.590  0.11202
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00378
## lmer.REML = 5233.6  Scale est. = 0.73005  n = 2041
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsnt_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.475074  0.329473  -1.442   0.149
## PDS_score     0.015271  0.040212   0.380   0.704
## interview_age  0.003848  0.002798   1.375   0.169
##
##
## R-sq.(adj) =  0.000503
## lmer.REML = 5589.5  Scale est. = 0.75739  n = 2064
```

## 2.5 Model: Accumbens Anticipation ~ PDS

### Females

```
##
```

```
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.0968160  0.2446591  -0.396   0.692
## PDS_score     -0.0008552  0.0219117  -0.039   0.969
## interview_age  0.0009134  0.0021051   0.434   0.664
##
##
## R-sq.(adj) =  -0.000795
## lmer.REML = 4276.4  Scale est. = 0.44122   n = 2044
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.318694  0.255800   1.246   0.213
## PDS_score       0.006030  0.030835   0.196   0.845
## interview_age  -0.002683  0.002173  -1.235   0.217
##
##
## R-sq.(adj) =  -0.000226
## lmer.REML = 4583.4  Scale est. = 0.50525   n = 2066
```

## 2.6 Model: Caudate Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.879700  0.304751   2.887 0.00394 **
## PDS_score      -0.021140  0.027194  -0.777 0.43703
## interview_age  -0.007289  0.002625  -2.777 0.00553 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) = 0.00389
## lmer.REML = 5192.5 Scale est. = 0.73778 n = 2042
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.031564  0.307208  -0.103   0.9182
## PDS_score     -0.078845  0.036926  -2.135   0.0329 *
## interview_age  0.001472  0.002611   0.564   0.5729
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0013
## lmer.REML = 5332.8 Scale est. = 0.76745 n = 2065
```

## 2.7 Model: Putamen Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.553835  0.291446   1.900   0.0575 .
## PDS_score      0.005590  0.026008   0.215   0.8298
## interview_age -0.005130  0.002509  -2.044   0.0410 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00101
## lmer.REML = 5000.7 Scale est. = 0.67013 n = 2042
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ PDS_score + interview_age
```



```
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.2672445  0.3067924   0.871   0.384
## PDS_score    -0.0619678  0.0369846  -1.676   0.094 .
## interview_age -0.0008925  0.0026000  -0.343   0.731
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000443
## lmer.REML = 5304.4  Scale est. = 0.74767   n = 2068
```

## 2.8 Model: Accumbens Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.457768  0.230801   1.983   0.0475 *
## PDS_score    -0.001013  0.020566  -0.049   0.9607
## interview_age -0.003938  0.001988  -1.981   0.0477 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00106
## lmer.REML = 4078.6  Scale est. = 0.42369   n = 2050
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.066775  0.248298  -0.269   0.788
## PDS_score    -0.041154  0.030143  -1.365   0.172
## interview_age  0.001413  0.002106   0.671   0.502
##
##
## R-sq.(adj) = -2.21e-05
## lmer.REML = 4403.4  Scale est. = 0.40091   n = 2061
```

## 2.9 Model: OFC Anticipation ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0590386  0.2040969   0.289   0.772
## PDS_score    0.0037308  0.0182241   0.205   0.838
## interview_age -0.0004418  0.0017592  -0.251   0.802
##
##
## R-sq.(adj) = -0.000933
## lmer.REML = 3536.8  Scale est. = 0.29608  n = 2038
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.039678  0.234446   0.169   0.866
## PDS_score    0.008097  0.020912   0.387   0.699
## interview_age -0.000431  0.002020  -0.213   0.831
##
##
## R-sq.(adj) = -0.000901
## lmer.REML = 4110.5  Scale est. = 0.43526  n = 2039
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.242985  0.216367  -1.123   0.262
## PDS_score    0.031944  0.026501   1.205   0.228
## interview_age 0.001747  0.001839   0.950   0.342
##
##
## R-sq.(adj) = 0.00126
## lmer.REML = 3846.2  Scale est. = 0.29898  n = 2060
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.1174623  0.2355002  -0.499  0.61799
## PDS_score    0.0776498  0.0286198   2.713  0.00672 **
## interview_age 0.0001156  0.0020019   0.058  0.95395
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00338
## lmer.REML = 4197.2  Scale est. = 0.37935    n = 2055
```

## 2.10 Model: OFC Feedback ~ PDS

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.250497  0.179292   1.397   0.163
## PDS_score    0.009944  0.016003   0.621   0.534
## interview_age -0.002448  0.001545  -1.585   0.113
##
##
## R-sq.(adj) =  0.000286
## lmer.REML = 3018.9  Scale est. = 0.22332    n = 2039
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0649137  0.2204114   0.295   0.768
## PDS_score    0.0101010  0.0197079   0.513   0.608
## interview_age -0.0007488  0.0018984  -0.394   0.693
##
##
## R-sq.(adj) = -0.000837
```

```
## lmer.REML = 3842.5  Scale est. = 0.34392  n = 2040
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## l0FC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.255465   0.194367  -1.314    0.189
## PDS_score      0.008297   0.023443   0.354    0.723
## interview_age  0.002312   0.001652   1.399    0.162
##
##
## R-sq.(adj) =  0.000168
## lmer.REML = 3469.7  Scale est. = 0.30665  n = 2070
##
## Family: gaussian
## Link function: identity
##
## Formula:
## m0FC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.0389465  0.2241386  -0.174    0.862
## PDS_score      0.0047312  0.0273317   0.173    0.863
## interview_age  0.0005657  0.0019042   0.297    0.766
##
##
## R-sq.(adj) = -0.000974
## lmer.REML =  4032  Scale est. = 0.29495  n = 2068
```

## 2.11 Model: Caudate Anticipation ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.531423   0.328131  -1.620    0.1055
## hormone_scr_ert_mean -0.001464   0.001304  -1.122    0.2618
## interview_age   0.004989   0.002807   1.777    0.0757 .
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0012
## lmer.REML = 5021.6  Scale est. = 0.79211    n = 1912
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0897165  0.3452219  -0.260    0.795
## hormone_scr_ert_mean  0.0005601  0.0014396   0.389    0.697
## interview_age    0.0005903  0.0029176   0.202    0.840
##
##
## R-sq.(adj) =  -0.000855
## lmer.REML = 5204.4  Scale est. = 0.63795    n = 1909
```

## 2.12 Model B: Putamen Anticipation ~ Testosterone

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsn_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.3478527  0.3189046  -1.091    0.276
## hormone_scr_ert_mean -0.0009987  0.0012676  -0.788    0.431
## interview_age    0.0031484  0.0027281   1.154    0.249
##
##
## R-sq.(adj) =  -5.42e-05
## lmer.REML = 4908.4  Scale est. = 0.74226    n = 1910
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsn_ant_z ~ hormone_scr_ert_mean + interview_age
##
```

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.398567   0.342070  -1.165   0.244
## hormone_scr_ert_mean 0.002031   0.001432   1.418   0.156
## interview_age    0.002873   0.002888   0.995   0.320
##
##
## R-sq.(adj) = 0.00128
## lmer.REML = 5164.5  Scale est. = 0.67683  n = 1909
```

## 2.13 Model: Accumbens Anticipation ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.1829273  0.2500379  -0.732   0.4645
## hormone_scr_ert_mean -0.0016855  0.0009949  -1.694   0.0904 .
## interview_age     0.0021275  0.0021417   0.993   0.3207
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.000853
## lmer.REML = 3998.8  Scale est. = 0.43208  n = 1913
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.178e-01  2.689e-01   1.182   0.238
## hormone_scr_ert_mean -7.346e-05  1.112e-03  -0.066   0.947
## interview_age    -2.577e-03  2.272e-03  -1.134   0.257
##
##
## R-sq.(adj) = -0.000356
## lmer.REML = 4285.7  Scale est. = 0.48893  n = 1912
```

## 2.14 Model: Caudate Feedback ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.964423   0.313893   3.072 0.002153 **
## hormone_scr_ert_mean 0.002594   0.001242   2.089 0.036870 *
## interview_age   -0.009086   0.002692  -3.375 0.000753 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00588
## lmer.REML =  4870  Scale est. = 0.74202  n = 1908
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0868994 0.3185461   0.273   0.785
## hormone_scr_ert_mean 0.0015974 0.0013239   1.207   0.228
## interview_age   -0.0007923 0.0026924  -0.294   0.769
##
##
## R-sq.(adj) = -0.000323
## lmer.REML =  4926  Scale est. = 0.76067  n = 1910
```

## 2.15 Model: Putamen Feedback ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.612850   0.297927   2.057 0.03982 *
```

```
## hormone_scr_ert_mean 0.003420 0.001185 2.887 0.00393 **
## interview_age -0.006594 0.002555 -2.581 0.00992 **
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00534
## lmer.REML = 4670.6 Scale est. = 0.66657 n = 1909
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.418505  0.316771  1.321    0.187
## hormone_scr_ert_mean 0.001448  0.001324  1.094    0.274
## interview_age   -0.003241  0.002668 -1.215    0.225
##
##
## R-sq.(adj) = -8.26e-05
## lmer.REML = 4891.5 Scale est. = 0.70816 n = 1914
```

## 2.16 Model: Accumbens Feedback ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.4856058  0.2310580  2.102  0.0357 *
## hormone_scr_ert_mean 0.0003708  0.0009171  0.404  0.6860
## interview_age   -0.0043599  0.0019815 -2.200  0.0279 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00144
## lmer.REML = 3720 Scale est. = 0.40205 n = 1916
```

### Males

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



```
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0529966  0.2602606   0.204   0.839
## hormone_scr_ert_mean 0.0014557  0.0010863   1.340   0.180
## interview_age   -0.0003699  0.0021990  -0.168   0.866
##
##
## R-sq.(adj) = 7.13e-05
## lmer.REML = 4112.2  Scale est. = 0.40893  n = 1906
```

## 2.17 Model: OFC Anticipation ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvs_n_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0032153  0.2104991   0.015   0.988
## hormone_scr_ert_mean -0.0006606  0.0008361  -0.790   0.430
## interview_age     0.0002883  0.0018063   0.160   0.873
##
##
## R-sq.(adj) = -0.0007
## lmer.REML = 3333.4  Scale est. = 0.30459  n = 1906
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvs_n_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0682507  0.2410390   0.283   0.777
## hormone_scr_ert_mean 0.0001874  0.0009567   0.196   0.845
## interview_age   -0.0006112  0.0020683  -0.295   0.768
##
##
## R-sq.(adj) = -0.000996
## lmer.REML = 3854.2  Scale est. = 0.43627  n = 1906
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvsn_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.2964474  0.2262633  -1.310   0.1903
## hormone_scr_ert_mean -0.0016077  0.0009445  -1.702   0.0889 .
## interview_age    0.0030026  0.0019116   1.571   0.1164
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00144
## lmer.REML = 3590.5  Scale est. = 0.29039    n = 1906
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsn_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.224238  0.246804  -0.909   0.364
## hormone_scr_ert_mean -0.001001  0.001023  -0.978   0.328
## interview_age    0.002198  0.002087   1.053   0.292
##
##
## R-sq.(adj) = -0.000111
## lmer.REML = 3919.4  Scale est. = 0.37723    n = 1902
```

## 2.18 Model: OFC Feedback ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2773309  0.1834713   1.512   0.1308
## hormone_scr_ert_mean 0.0012000  0.0007282   1.648   0.0995 .
## interview_age   -0.0029118  0.0015740  -1.850   0.0645 .
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0017
## lmer.REML = 2821.7  Scale est. = 0.21617    n = 1908
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.1195496  0.2235176   0.535   0.593
## hormone_scr_ert_mean 0.0007248  0.0008892   0.815   0.415
## interview_age  -0.0012938  0.0019163  -0.675   0.500
##
##
## R-sq.(adj) = -0.000459
## lmer.REML = 3559.8  Scale est. = 0.32991    n = 1910
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -1.184e-01  2.019e-01  -0.586   0.558
## hormone_scr_ert_mean  5.975e-05  8.407e-04   0.071   0.943
## interview_age    1.299e-03  1.707e-03   0.761   0.447
##
##
## R-sq.(adj) = -0.000723
## lmer.REML = 3221.2  Scale est. = 0.31011    n = 1916
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0339223  0.2347347   0.145   0.885
## hormone_scr_ert_mean 0.0008065  0.0009739   0.828   0.408
## interview_age  -0.0001671  0.0019852  -0.084   0.933
##
```

```
##
## R-sq.(adj) = -0.000796
## lmer.REML = 3767.6  Scale est. = 0.30086  n = 1914
```

## 2.19 Model: MID Reaction Time ~ Testosterone

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.632232   0.323186  -1.956   0.0506 .
## hormone_scr_ert_mean -0.001512   0.001288  -1.174   0.2406
## interview_age     0.006172   0.002768   2.230   0.0259 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00188
## lmer.REML = 5548.9  Scale est. = 0.69062  n = 2060
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.3682838   0.3262383  -1.129   0.259
## hormone_scr_ert_mean -0.0008419   0.0012987  -0.648   0.517
## interview_age     0.0034244   0.0027936   1.226   0.220
##
##
## R-sq.(adj) = 4.58e-06
## lmer.REML = 5588.1  Scale est. = 0.7507  n = 2060
```

### Males

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

```
## (Intercept)          0.1164860  0.3026794   0.385    0.700
## hormone_scr_ert_mean -0.0006606  0.0012601  -0.524    0.600
## interview_age        -0.0008780  0.0025578  -0.343    0.731
##
##
## R-sq.(adj) =  -0.00061
## lmer.REML = 5528.2  Scale est. = 0.66131    n = 2139
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1706450  0.3036607   0.562   0.574
## hormone_scr_ert_mean -0.0015477  0.0012570  -1.231   0.218
## interview_age   -0.0009004  0.0025680  -0.351   0.726
##
##
## R-sq.(adj) =  -5.41e-05
## lmer.REML = 5557.2  Scale est. = 0.6718     n = 2139
```

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

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.346483  0.314741   1.101   0.271
## hormone_scr_ert_mean -0.001040  0.001248  -0.833   0.405
## interview_age   -0.002945  0.002684  -1.097   0.273
##
##
## R-sq.(adj) =  0.000485
## lmer.REML = 7029.3  Scale est. = 0.70773    n = 2502
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ hormone_scr_ert_mean + interview_age
##
```

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.182571   0.298508   0.612   0.541
## hormone_scr_ert_mean 0.002190   0.001242   1.763   0.078 .
## interview_age     -0.001492   0.002522  -0.592   0.554
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00108
## lmer.REML = 7475.7  Scale est. = 0.70116   n = 2703
```

### 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)      4.052176   2.071394   1.956 0.05057 .
## accumbens_rvsnt_ant_z -0.043681   0.171115  -0.255 0.79854
## interview_age     -0.006634   0.015772  -0.421 0.67410
## race.ethnicity.5levelBlack 0.961315   0.887252   1.083 0.27873
## race.ethnicity.5levelMixed 2.510150   0.877107   2.862 0.00426 **
## race.ethnicity.5levelOther 2.570818   0.993973   2.586 0.00977 **
## race.ethnicity.5levelWhite 1.391087   0.825806   1.685 0.09224 .
## demo_race_hispanic1    0.551391   0.349161   1.579 0.11445
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00793
## lmer.REML = 12329  Scale est. = 11.287   n = 1999
```

##### 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)      0.90981    2.01145   0.452 0.651089
## accumbens_rvsnt_z -0.13397    0.15780  -0.849 0.396000
## interview_age      0.01412    0.01545   0.914 0.361018
## race.ethnicity.5levelBlack 1.42784    0.86544   1.650 0.099129 .
## race.ethnicity.5levelMixed 2.86668    0.86090   3.330 0.000885 ***
## race.ethnicity.5levelOther 2.88778    0.99103   2.914 0.003609 **
## race.ethnicity.5levelWhite 2.12172    0.80947   2.621 0.008830 **
## demo_race_hispanic1    0.09777    0.33410   0.293 0.769826
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00616
## lmer.REML = 12392  Scale est. = 17.372    n = 2024
```

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

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_rvsnt_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.160983    2.075918   2.004 0.04516 *
## caudate_rvsnt_z   -0.046176    0.131676  -0.351 0.72587
## interview_age     -0.007467    0.015809  -0.472 0.63675
## race.ethnicity.5levelBlack 0.986848    0.888683   1.110 0.26693
## race.ethnicity.5levelMixed 2.487496    0.877216   2.836 0.00462 **
## race.ethnicity.5levelOther 2.540475    0.993072   2.558 0.01060 *
## race.ethnicity.5levelWhite 1.395773    0.826508   1.689 0.09142 .
## demo_race_hispanic1    0.533009    0.348799   1.528 0.12664
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00767
## lmer.REML = 12328  Scale est. = 11.357    n = 1998
```

#### Males

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

```
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.13846    2.02066   0.563  0.57322
## caudate_rvsnt_z  -0.11700    0.12316  -0.950  0.34225
## interview_age      0.01280    0.01548   0.827  0.40846
## race.ethnicity.5levelBlack  1.35206    0.88553   1.527  0.12696
## race.ethnicity.5levelMixed  2.78962    0.88126   3.165  0.00157 **
## race.ethnicity.5levelOther  2.88797    1.00597   2.871  0.00414 **
## race.ethnicity.5levelWhite  2.05860    0.83114   2.477  0.01334 *
## demo_race_hispanic1    0.13001    0.33630   0.387  0.69911
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00574
## lmer.REML = 12383 Scale est. = 17.514    n = 2022
```

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

#### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_rvsnt_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.985373    2.067539   1.928  0.05405 .
## putamen_rvsnt_z  -0.092672    0.135033  -0.686  0.49261
## interview_age     -0.006113    0.015749  -0.388  0.69797
## race.ethnicity.5levelBlack  1.044319    0.883990   1.181  0.23760
## race.ethnicity.5levelMixed  2.522607    0.873375   2.888  0.00391 **
## race.ethnicity.5levelOther  2.565497    0.990442   2.590  0.00966 **
## race.ethnicity.5levelWhite  1.370892    0.822614   1.667  0.09577 .
## demo_race_hispanic1    0.551256    0.347961   1.584  0.11330
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00803
## lmer.REML = 12293 Scale est. = 11.28    n = 1995
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_rvsnt_z + interview_age +
```



```
##      race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.94564    2.01703   0.469  0.63924
## putamen_rvsnt_z  -0.16425    0.12296  -1.336  0.18174
## interview_age      0.01425    0.01545   0.922  0.35646
## race.ethnicity.5levelBlack  1.42743    0.88405   1.615  0.10654
## race.ethnicity.5levelMixed  2.82456    0.87774   3.218  0.00131 **
## race.ethnicity.5levelOther  2.75170    1.00721   2.732  0.00635 **
## race.ethnicity.5levelWhite  2.08091    0.82917   2.510  0.01216 *
## demo_race_hispanic1    0.08926    0.33586   0.266  0.79046
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00557
## lmer.REML = 12378 Scale est. = 17.128    n = 2023
```

### 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)      3.838930    2.065678   1.858  0.06325 .
## accumbens_posvsneg_feedback_z -0.046257    0.178948  -0.258  0.79605
## interview_age     -0.004964    0.015734  -0.315  0.75243
## race.ethnicity.5levelBlack  1.004141    0.883574   1.136  0.25590
## race.ethnicity.5levelMixed  2.419609    0.873629   2.770  0.00566 **
## race.ethnicity.5levelOther  2.610210    0.987916   2.642  0.00830 **
## race.ethnicity.5levelWhite  1.417874    0.823111   1.723  0.08512 .
## demo_race_hispanic1    0.471797    0.348750   1.353  0.17626
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00659
## lmer.REML = 12353 Scale est. = 11.268    n = 2005
```

#### 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)      0.77475    1.99660   0.388 0.698032
## accumbens_posvsneg_feedback_z 0.32566    0.16284   2.000 0.045644 *
## interview_age      0.01477    0.01534   0.963 0.335823
## race.ethnicity.5levelBlack    1.51036    0.85866   1.759 0.078735 .
## race.ethnicity.5levelMixed    2.91146    0.85216   3.417 0.000647 ***
## race.ethnicity.5levelOther    3.04869    0.98188   3.105 0.001930 **
## race.ethnicity.5levelWhite    2.12718    0.80145   2.654 0.008013 **
## demo_race_hispanic1    0.06274    0.33218   0.189 0.850220
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00785
## lmer.REML = 12336 Scale est. = 17.742    n = 2021
```

### 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)      4.174121    2.078905   2.008 0.04479 *
## caudate_posvsneg_feedback_z -0.178458    0.133986  -1.332 0.18304
## interview_age      -0.007524    0.015835  -0.475 0.63473
## race.ethnicity.5levelBlack    1.026574    0.888082   1.156 0.24784
## race.ethnicity.5levelMixed    2.438043    0.876042   2.783 0.00544 **
## race.ethnicity.5levelOther    2.443722    0.992035   2.463 0.01385 *
## race.ethnicity.5levelWhite    1.358837    0.825732   1.646 0.10000
## demo_race_hispanic1    0.542136    0.350534   1.547 0.12212
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0083
## lmer.REML = 12316 Scale est. = 11.382    n = 1997
```

#### 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)      1.421202    2.024330   0.702  0.48272
## caudate_posvsneg_feedback_z 0.118954    0.130857   0.909  0.36344
## interview_age      0.009903    0.015487   0.639  0.52261
## race.ethnicity.5levelBlack 1.426455    0.874856   1.631  0.10315
## race.ethnicity.5levelMixed 2.846507    0.869937   3.272  0.00109 **
## race.ethnicity.5levelOther 2.962154    0.995131   2.977  0.00295 **
## race.ethnicity.5levelWhite 2.094779    0.819002   2.558  0.01061 *
## demo_race_hispanic1      0.154159    0.335180   0.460  0.64562
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00595
## lmer.REML = 12389  Scale est. = 17.501    n = 2023
```

### 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)      3.937682    2.075294   1.897  0.05792 .
## putamen_posvsneg_feedback_z -0.091652    0.141345  -0.648  0.51678
## interview_age      -0.005695    0.015808  -0.360  0.71870
## race.ethnicity.5levelBlack  1.061865    0.888416   1.195  0.23214
## race.ethnicity.5levelMixed  2.459395    0.876016   2.807  0.00504 **
## race.ethnicity.5levelOther  2.506314    0.994597   2.520  0.01182 *
## race.ethnicity.5levelWhite  1.375676    0.826241   1.665  0.09607 .
## demo_race_hispanic1      0.556521    0.350406   1.588  0.11240
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00756
## lmer.REML = 12310  Scale est. = 11.343    n = 1996
```

#### 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)      1.05524    2.01873   0.523 0.601223
## putamen_posvsneg_feedback_z 0.14036    0.13237   1.060 0.289116
## interview_age      0.01249    0.01549   0.806 0.420296
## race.ethnicity.5levelBlack  1.46805    0.86859   1.690 0.091153 .
## race.ethnicity.5levelMixed  2.91149    0.86315   3.373 0.000757 ***
## race.ethnicity.5levelOther  2.98856    0.99153   3.014 0.002610 **
## race.ethnicity.5levelWhite  2.17694    0.81221   2.680 0.007416 **
## demo_race_hispanic1      0.08749    0.33699   0.260 0.795178
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00591
## lmer.REML = 12432 Scale est. = 17.729    n = 2028
```

### 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)      3.945689    2.088229   1.889 0.05897 .
## lOFC_rvsn_ant_z    0.092356    0.206649   0.447 0.65498
## interview_age     -0.005135    0.015862  -0.324 0.74617
## race.ethnicity.5levelBlack  0.949446    0.895071   1.061 0.28893
## race.ethnicity.5levelMixed  2.410749    0.885797   2.722 0.00655 **
## race.ethnicity.5levelOther  2.446597    1.001979   2.442 0.01470 *
## race.ethnicity.5levelWhite  1.303526    0.834533   1.562 0.11845
## demo_race_hispanic1    0.566955    0.349537   1.622 0.10496
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0076
## lmer.REML = 12300 Scale est. = 11.614    n = 1994
##
## Family: gaussian
## Link function: identity
##
```

```
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_rvsnt_ant_z + interview_age + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.887753    2.085389   1.864  0.06243 .
## mOFC_rvsnt_ant_z    0.184766    0.174982   1.056  0.29114
## interview_age     -0.004795    0.015837  -0.303  0.76210
## race.ethnicity.5levelBlack  0.946118    0.895477   1.057  0.29084
## race.ethnicity.5levelMixed  2.424899    0.886298   2.736  0.00627 **
## race.ethnicity.5levelOther  2.516611    1.004105   2.506  0.01228 *
## race.ethnicity.5levelWhite  1.342866    0.835098   1.608  0.10799
## demo_race_hispanic1    0.557219    0.349619   1.594  0.11114
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0082
## lmer.REML = 12308 Scale est. = 11.42    n = 1995
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_rvsnt_ant_z + interview_age + race.ethnicity.5level +
## demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.649e-01  1.995e+00   0.133  0.89436
## lOFC_rvsnt_ant_z    3.840e-03  1.865e-01   0.021  0.98357
## interview_age     1.992e-02  1.533e-02   1.300  0.19371
## race.ethnicity.5levelBlack  1.417e+00  8.574e-01   1.653  0.09856 .
## race.ethnicity.5levelMixed  2.804e+00  8.524e-01   3.290  0.00102 **
## race.ethnicity.5levelOther  2.880e+00  9.798e-01   2.940  0.00332 **
## race.ethnicity.5levelWhite  2.044e+00  8.009e-01   2.552  0.01080 *
## demo_race_hispanic1   -6.687e-05  3.323e-01   0.000  0.99984
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00548
## lmer.REML = 12332 Scale est. = 17.059    n = 2021
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_rvsnt_ant_z + interview_age + race.ethnicity.5level +
## demo_race_hispanic
```

```
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.42987    2.00279   0.215  0.83007
## mOFC_rvs_n_ant_z  0.27046    0.17117   1.580  0.11426
## interview_age     0.01874    0.01538   1.218  0.22323
## race.ethnicity.5levelBlack 1.34471    0.86121   1.561  0.11858
## race.ethnicity.5levelMixed 2.73744    0.85492   3.202  0.00139 **
## race.ethnicity.5levelOther 2.86734    0.98038   2.925  0.00349 **
## race.ethnicity.5levelWhite 2.03045    0.80355   2.527  0.01159 *
## demo_race_hispanic1 0.03911    0.33258   0.118  0.90639
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00707
## lmer.REML = 12301  Scale est. = 17.183    n = 2014
```

### 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)      3.918460    2.071655   1.891  0.05871 .
## lOFC_posvsneg_feedback_z -0.196960    0.231572  -0.851  0.39513
## interview_age     -0.005545    0.015784  -0.351  0.72540
## race.ethnicity.5levelBlack 1.018741    0.883760   1.153  0.24916
## race.ethnicity.5levelMixed 2.433765    0.872756   2.789  0.00534 **
## race.ethnicity.5levelOther 2.741777    0.994022   2.758  0.00586 **
## race.ethnicity.5levelWhite 1.391187    0.822128   1.692  0.09077 .
## demo_race_hispanic1  0.465982    0.348214   1.338  0.18098
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00806
## lmer.REML = 12285  Scale est. = 11.271    n = 1994
##
## 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)      4.023520   2.074379   1.940  0.05257 .
## mOFC_posvsneg_feedback_z -0.167758   0.189547  -0.885  0.37624
## interview_age     -0.006339   0.015808  -0.401  0.68849
## race.ethnicity.5levelBlack  1.004855   0.886400   1.134  0.25708
## race.ethnicity.5levelMixed  2.433716   0.874753   2.782  0.00545 **
## race.ethnicity.5levelOther  2.575923   0.991115   2.599  0.00942 **
## race.ethnicity.5levelWhite  1.380283   0.823927   1.675  0.09404 .
## demo_race_hispanic1       0.518458   0.348645   1.487  0.13716
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00815
## lmer.REML = 12295  Scale est. = 11.469    n = 1994
```

## 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)      0.77055    1.99466   0.386 0.699312
## lOFC_posvsneg_feedback_z  0.04810    0.20526   0.234 0.814738
## interview_age     0.01541    0.01532   1.006 0.314405
## race.ethnicity.5levelBlack  1.46420    0.85984   1.703 0.088745 .
## race.ethnicity.5levelMixed  2.88778    0.85380   3.382 0.000733 ***
## race.ethnicity.5levelOther  2.84553    0.98502   2.889 0.003908 **
## race.ethnicity.5levelWhite  2.08630    0.80307   2.598 0.009447 **
## demo_race_hispanic1       0.06155    0.33289   0.185 0.853316
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00565
## lmer.REML = 12392  Scale est. = 17.111    n = 2029
##
## 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)      0.80386    1.99379   0.403 0.686858
```

```
## mOFC_posvsneg_feedback_z      0.27553      0.17865      1.542 0.123160
## interview_age                  0.01508      0.01531      0.985 0.324691
## race.ethnicity.5levelBlack     1.44976      0.85958      1.687 0.091839 .
## race.ethnicity.5levelMixed     2.90987      0.85377      3.408 0.000667 ***
## race.ethnicity.5levelOther     2.90159      0.98245      2.953 0.003179 **
## race.ethnicity.5levelWhite     2.08983      0.80305      2.602 0.009326 **
## demo_race_hispanic1           0.03963      0.33252      0.119 0.905135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00704
## lmer.REML = 12380  Scale est. = 17.178    n = 2027
```

### 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)      2.87599      1.89810      1.515 0.12984
## bisbas_ss_basm_rr -0.06648      0.04530     -1.468 0.14231
## interview_age      0.01054      0.01412      0.746 0.45561
## race.ethnicity.5levelBlack 0.57633      0.78656      0.733 0.46379
## race.ethnicity.5levelMixed 2.01387      0.78875      2.553 0.01073 *
## race.ethnicity.5levelOther 2.77250      0.90192      3.074 0.00213 **
## race.ethnicity.5levelWhite 1.38776      0.74259      1.869 0.06176 .
## demo_race_hispanic1      0.18709      0.31806      0.588 0.55645
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00746
## lmer.REML = 16337  Scale est. = 13.091    n = 2629
```

#### 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)                2.183626    1.837663    1.188    0.23483
## bisbas_ss_basm_rr          0.003817    0.044574    0.086    0.93177
## interview_age              0.009560    0.013816    0.692    0.48905
## race.ethnicity.5levelBlack 1.610755    0.750902    2.145    0.03203 *
## race.ethnicity.5levelMixed 2.100595    0.755919    2.779    0.00549 **
## race.ethnicity.5levelOther 1.983774    0.862904    2.299    0.02158 *
## race.ethnicity.5levelWhite 1.502642    0.709067    2.119    0.03416 *
## demo_race_hispanic1        0.317069    0.301590    1.051    0.29320
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000948
## lmer.REML = 17729  Scale est. = 15.738    n = 2847
```

### 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)      4.55400    1.98160   2.298  0.02165 *
## rt_diff_large_neutral_z  0.13920    0.12178   1.143  0.25318
## interview_age     -0.01062    0.01514  -0.702  0.48306
## race.ethnicity.5levelBlack 0.95841    0.84017   1.141  0.25411
## race.ethnicity.5levelMixed 2.34332    0.83412   2.809  0.00501 **
## race.ethnicity.5levelOther 2.81105    0.94816   2.965  0.00306 **
## race.ethnicity.5levelWhite 1.38364    0.78299   1.767  0.07735 .
## demo_race_hispanic1    0.49857    0.34170   1.459  0.14470
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00833
## lmer.REML = 13269  Scale est. = 11.8    n = 2153
##
## 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)      4.464661    1.980676   2.254  0.02429 *
```

```
## rt_diff_large_small_z      -0.123532    0.120640   -1.024    0.30597
## interview_age              -0.009608    0.015124   -0.635    0.52528
## race.ethnicity.5levelBlack  0.926365    0.839755    1.103    0.27009
## race.ethnicity.5levelMixed  2.326042    0.833976    2.789    0.00533 **
## race.ethnicity.5levelOther  2.779393    0.948352    2.931    0.00342 **
## race.ethnicity.5levelWhite  1.364444    0.782899    1.743    0.08151 .
## demo_race_hispanic1        0.485413    0.341768    1.420    0.15567
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00793
## lmer.REML = 13269  Scale est. = 11.747    n = 2153
```

## 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)      1.23765    1.93604   0.639  0.52271
## rt_diff_large_neutral_z  0.07626    0.12536   0.608  0.54304
## interview_age      0.01698    0.01481   1.146  0.25173
## race.ethnicity.5levelBlack  0.95348    0.84099   1.134  0.25702
## race.ethnicity.5levelMixed  2.18027    0.83793   2.602  0.00933 **
## race.ethnicity.5levelOther  2.00082    0.96151   2.081  0.03755 *
## race.ethnicity.5levelWhite  1.45145    0.79076   1.836  0.06656 .
## demo_race_hispanic1      0.16620    0.32281   0.515  0.60671
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00317
## lmer.REML = 13877  Scale est. = 16.854    n = 2257
##
## 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)      1.28604    1.93561   0.664  0.5065
## rt_diff_large_small_z -0.07689    0.12414  -0.619  0.5357
## interview_age      0.01678    0.01481   1.133  0.2574
## race.ethnicity.5levelBlack  0.93933    0.84074   1.117  0.2640
```

```
## race.ethnicity.5levelMixed 2.15236 0.83755 2.570 0.0102 *
## race.ethnicity.5levelOther 1.96006 0.96117 2.039 0.0415 *
## race.ethnicity.5levelWhite 1.42757 0.79053 1.806 0.0711 .
## demo_race_hispanic1 0.16026 0.32289 0.496 0.6197
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00316
## lmer.REML = 13877 Scale est. = 16.926 n = 2257
```

## 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_ant_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.93246    2.07818   2.373 0.017717 *
## PDS_score       0.66789    0.17883   3.735 0.000193 ***
## accumbens_rvsnt_ant_z -0.74666    0.42905  -1.740 0.081967 .
## race.ethnicity.5levelBlack 0.54545    0.89101   0.612 0.540495
## race.ethnicity.5levelMixed 2.34273    0.87490   2.678 0.007473 **
## race.ethnicity.5levelOther 2.34680    0.99199   2.366 0.018089 *
## race.ethnicity.5levelWhite 1.35252    0.82265   1.644 0.100314
## demo_race_hispanic1 0.49442    0.34785   1.421 0.155373
## interview_age   -0.02243    0.01629  -1.377 0.168697
## PDS_score:accumbens_rvsnt_ant_z 0.42529    0.23874   1.781 0.074993 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0145
## lmer.REML = 12315 Scale est. = 11.173 n = 1999
```

#### Males

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

```
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.110611   2.008767   0.553  0.58041
## PDS_score      0.740905   0.231386   3.202  0.00139 **
## accumbens_rvsnt_z -0.176929  0.431793  -0.410  0.68203
## race.ethnicity.5levelBlack  1.132849  0.868849   1.304  0.19243
## race.ethnicity.5levelMixed  2.813470  0.859399   3.274  0.00108 **
## race.ethnicity.5levelOther  2.805834  0.989336   2.836  0.00461 **
## race.ethnicity.5levelWhite  2.102583  0.807940   2.602  0.00933 **
## demo_race_hispanic1    0.031139  0.334895   0.093  0.92593
## interview_age      0.004685  0.015705   0.298  0.76547
## PDS_score:accumbens_rvsnt_z  0.028998  0.297823   0.097  0.92244
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00996
## lmer.REML = 12383 Scale est. = 17.312 n = 2024
```

## 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.16482   2.08805   2.474  0.013462 *
## PDS_score      0.69019   0.17965   3.842  0.000126 ***
## caudate_rvsnt_z -0.11993  0.32559  -0.368  0.712651
## race.ethnicity.5levelBlack  0.54705   0.89316   0.612  0.540289
## race.ethnicity.5levelMixed  2.29666   0.87576   2.622  0.008796 **
## race.ethnicity.5levelOther  2.30580   0.99182   2.325  0.020181 *
## race.ethnicity.5levelWhite  1.32860   0.82400   1.612  0.107037
## demo_race_hispanic1    0.49035   0.34786   1.410  0.158803
## interview_age    -0.02440  0.01638  -1.490  0.136466
## PDS_score:caudate_rvsnt_z  0.05174   0.18124   0.285  0.775296
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0131
## lmer.REML = 12316 Scale est. = 11.35 n = 1998
```

### Males

```
##
```

```

## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * caudate_rvs_n_ant_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.330434   2.016643   0.660 0.509505
## PDS_score       0.764180   0.231367   3.303 0.000974 ***
## caudate_rvs_n_ant_z 0.289141  0.350447   0.825 0.409434
## race.ethnicity.5levelBlack 1.031591  0.888271   1.161 0.245639
## race.ethnicity.5levelMixed 2.698742  0.879861   3.067 0.002189 **
## race.ethnicity.5levelOther 2.786111  1.003964   2.775 0.005569 **
## race.ethnicity.5levelWhite 2.024026  0.829244   2.441 0.014740 *
## demo_race_hispanic1  0.053239  0.336319   0.158 0.874237
## interview_age     0.003358  0.015718   0.214 0.830824
## PDS_score:caudate_rvs_n_ant_z -0.302925  0.243097  -1.246 0.212869
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0105
## lmer.REML = 12373  Scale est. = 17.352    n = 2022

```

### 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.97477   2.07632   2.396 0.016669 *
## PDS_score       0.69413   0.17949   3.867 0.000114 ***
## putamen_rvs_n_ant_z -0.37583  0.32746  -1.148 0.251214
## race.ethnicity.5levelBlack 0.59070   0.88838   0.665 0.506182
## race.ethnicity.5levelMixed 2.32554   0.87167   2.668 0.007695 **
## race.ethnicity.5levelOther 2.29813   0.98931   2.323 0.020281 *
## race.ethnicity.5levelWhite 1.29941   0.81989   1.585 0.113158
## demo_race_hispanic1  0.50620   0.34697   1.459 0.144749
## interview_age    -0.02287  0.01628  -1.404 0.160369
## PDS_score:putamen_rvs_n_ant_z 0.18597   0.18035   1.031 0.302586
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```
##
## R-sq.(adj) = 0.014
## lmer.REML = 12281 Scale est. = 11.319 n = 1995
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * putamen_rvsnt_z + race.ethnicity.5level +
## demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.069415   2.010972   0.532 0.594930
## PDS_score       0.795180   0.232011   3.427 0.000622 ***
## putamen_rvsnt_z 0.685059   0.347481   1.972 0.048803 *
## race.ethnicity.5levelBlack 1.112071   0.885549   1.256 0.209335
## race.ethnicity.5levelMixed 2.732836   0.874919   3.124 0.001812 **
## race.ethnicity.5levelOther 2.668475   1.003956   2.658 0.007924 **
## race.ethnicity.5levelWhite 2.059818   0.826294   2.493 0.012752 *
## demo_race_hispanic1 -0.002783   0.335825  -0.008 0.993388
## interview_age    0.005000   0.015680   0.319 0.749830
## PDS_score:putamen_rvsnt_z -0.641137   0.244624  -2.621 0.008836 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) = 0.0126
## lmer.REML = 12362 Scale est. = 16.639 n = 2023
```

#### 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_rvsnt_z + race.ethnicity.5level +
## demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.90115   2.09807   2.336 0.019589 *
## PDS_score       0.66515   0.17977   3.700 0.000222 ***
## lOFC_rvsnt_z    0.01527   0.52247   0.029 0.976689
## race.ethnicity.5levelBlack 0.52114   0.89989   0.579 0.562581
## race.ethnicity.5levelMixed 2.24412   0.88436   2.538 0.011239 *
## race.ethnicity.5levelOther 2.23647   1.00065   2.235 0.025527 *
## race.ethnicity.5levelWhite 1.24974   0.83231   1.502 0.133380
```

```
## demo_race_hispanic1      0.51354      0.34902      1.471 0.141342
## interview_age            -0.02142      0.01641     -1.305 0.192031
## PDS_score:lOFC_rvsn_ant_z 0.03931      0.28333      0.139 0.889677
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0124
## lmer.REML = 12288  Scale est. = 11.562    n = 1994
```

#### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * lOFC_rvsn_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.44213     1.99293   0.222  0.82445
## PDS_score         0.64668     0.23294   2.776  0.00555 **
## lOFC_rvsn_ant_z   -0.45904     0.50823  -0.903  0.36652
## race.ethnicity.5levelBlack 1.15256     0.86113   1.338  0.18091
## race.ethnicity.5levelMixed 2.77674     0.85121   3.262  0.00112 **
## race.ethnicity.5levelOther 2.81757     0.97872   2.879  0.00403 **
## race.ethnicity.5levelWhite 2.03354     0.79959   2.543  0.01106 *
## demo_race_hispanic1 -0.05669     0.33250  -0.170  0.86464
## interview_age      0.01160     0.01560   0.744  0.45719
## PDS_score:lOFC_rvsn_ant_z 0.32821     0.34564   0.950  0.34245
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0085
## lmer.REML = 12324  Scale est. = 16.899    n = 2021
```

### 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_rvsn_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.84149     2.09453   2.311 0.020908 *
```

```
## PDS_score          0.66802    0.17956    3.720 0.000204 ***
## mOFC_rvs_n_ant_z   -0.03687    0.43630   -0.085 0.932667
## race.ethnicity.5levelBlack 0.51760    0.90004    0.575 0.565296
## race.ethnicity.5levelMixed 2.25855    0.88469    2.553 0.010757 *
## race.ethnicity.5levelOther 2.31830    1.00294    2.312 0.020907 *
## race.ethnicity.5levelWhite 1.29551    0.83274    1.556 0.119937
## demo_race_hispanic1    0.49881    0.34895    1.429 0.153030
## interview_age        -0.02114    0.01638   -1.291 0.196961
## PDS_score:mOFC_rvs_n_ant_z 0.13133    0.23937    0.549 0.583311
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0134
## lmer.REML = 12296  Scale est. = 11.364    n = 1995
```

#### Males

```
##
## 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.624062   2.000859   0.312  0.75515
## PDS_score      0.683251   0.232281   2.941  0.00330 **
## mOFC_rvs_n_ant_z 0.219209   0.460608   0.476  0.63419
## race.ethnicity.5levelBlack 1.077705   0.864995   1.246  0.21294
## race.ethnicity.5levelMixed 2.695055   0.854542   3.154  0.00164 **
## race.ethnicity.5levelOther 2.785797   0.979830   2.843  0.00451 **
## race.ethnicity.5levelWhite 2.014115   0.802688   2.509  0.01218 *
## demo_race_hispanic1 -0.015705   0.332742  -0.047  0.96236
## interview_age    0.009928   0.015649   0.634  0.52589
## PDS_score:mOFC_rvs_n_ant_z 0.015746   0.300671   0.052  0.95824
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0101
## lmer.REML = 12294  Scale est. = 17.078    n = 2014
```

### 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
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.86589    2.07602   2.344  0.01918
## PDS_score         0.68636    0.17813   3.853  0.00012
## accumbens_posvsneg_feedback_z -0.39320    0.44400  -0.886  0.37595
## race.ethnicity.5levelBlack      0.54437    0.88849   0.613  0.54015
## race.ethnicity.5levelMixed      2.21939    0.87236   2.544  0.01103
## race.ethnicity.5levelOther      2.36260    0.98666   2.395  0.01673
## race.ethnicity.5levelWhite      1.34627    0.82071   1.640  0.10108
## demo_race_hispanic1      0.42095    0.34808   1.209  0.22667
## interview_age      -0.02196    0.01627  -1.349  0.17744
## PDS_score:accumbens_posvsneg_feedback_z  0.20945    0.24541   0.853  0.39350
##
## (Intercept)      *
## PDS_score         ***
## accumbens_posvsneg_feedback_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed      *
## race.ethnicity.5levelOther      *
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## PDS_score:accumbens_posvsneg_feedback_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0121
## lmer.REML = 12340  Scale est. = 11.244    n = 2005
```

## 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
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.974341    1.993967   0.489  0.625147
## PDS_score         0.709079    0.229247   3.093  0.002008
## accumbens_posvsneg_feedback_z  0.015265    0.446047   0.034  0.972703
## race.ethnicity.5levelBlack      1.234169    0.861883   1.432  0.152315
## race.ethnicity.5levelMixed      2.847060    0.850813   3.346  0.000834
## race.ethnicity.5levelOther      2.960141    0.980339   3.020  0.002564
## race.ethnicity.5levelWhite      2.098703    0.800058   2.623  0.008777
## demo_race_hispanic1     -0.001490    0.332586  -0.004  0.996427
## interview_age      0.005746    0.015588   0.369  0.712435
## PDS_score:accumbens_posvsneg_feedback_z  0.235992    0.304036   0.776  0.437724
```

```
##
## (Intercept)
## PDS_score **
## accumbens_posvsneg_feedback_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed ***
## race.ethnicity.5levelOther **
## race.ethnicity.5levelWhite **
## demo_race_hispanic1
## interview_age
## PDS_score:accumbens_posvsneg_feedback_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0113
## lmer.REML = 12328 Scale est. = 17.656 n = 2021
```

#### 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.24064   2.08996   2.508  0.0122 *
## PDS_score       0.70970   0.17965   3.951 8.07e-05 ***
## caudate_posvsneg_feedback_z -0.42312   0.33771  -1.253  0.2104
## race.ethnicity.5levelBlack  0.54975   0.89324   0.615  0.5383
## race.ethnicity.5levelMixed  2.22349   0.87503   2.541  0.0111 *
## race.ethnicity.5levelOther  2.17874   0.99090   2.199  0.0280 *
## race.ethnicity.5levelWhite  1.27525   0.82348   1.549  0.1216
## demo_race_hispanic1    0.49242   0.34972   1.408  0.1593
## interview_age    -0.02506   0.01638  -1.530  0.1263
## PDS_score:caudate_posvsneg_feedback_z  0.15205   0.18800   0.809  0.4187
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0138
## lmer.REML = 12303 Scale est. = 11.31 n = 1997
```

##### 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
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.662714   2.020642   0.823 0.410682
## PDS_score       0.794117   0.232017   3.423 0.000633 ***
## caudate_posvsneg_feedback_z -0.149997   0.355454  -0.422 0.673080
## race.ethnicity.5levelBlack    1.113313   0.877511   1.269 0.204689
## race.ethnicity.5levelMixed    2.793385   0.867905   3.219 0.001309 **
## race.ethnicity.5levelOther    2.896433   0.993050   2.917 0.003577 **
## race.ethnicity.5levelWhite    2.067674   0.817029   2.531 0.011458 *
## demo_race_hispanic1          0.068190   0.335459   0.203 0.838942
## interview_age       -0.000349   0.015732  -0.022 0.982303
## PDS_score:caudate_posvsneg_feedback_z 0.207256   0.237647   0.872 0.383250
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0107
## lmer.REML = 12379  Scale est. = 17.388    n = 2023
```

#### 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
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.86580   2.08450   2.334 0.019680 *
## PDS_score       0.67167   0.17939   3.744 0.000186 ***
## putamen_posvsneg_feedback_z  0.04503   0.35173   0.128 0.898143
## race.ethnicity.5levelBlack    0.63545   0.89359   0.711 0.477091
## race.ethnicity.5levelMixed    2.29627   0.87490   2.625 0.008742 **
## race.ethnicity.5levelOther    2.27889   0.99332   2.294 0.021882 *
## race.ethnicity.5levelWhite    1.32205   0.82379   1.605 0.108689
## demo_race_hispanic1          0.51174   0.34948   1.464 0.143267
## interview_age       -0.02187   0.01634  -1.338 0.181011
## PDS_score:putamen_posvsneg_feedback_z -0.08259   0.19310  -0.428 0.668914
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0131
## lmer.REML = 12299  Scale est. = 11.345    n = 1996
```

## 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.358783   2.015957   0.674 0.500380
## PDS_score       0.760030   0.231803   3.279 0.001060 **
## putamen_posvsneg_feedback_z -0.306904   0.361874  -0.848 0.396484
## race.ethnicity.5levelBlack    1.152753   0.871332   1.323 0.185993
## race.ethnicity.5levelMixed    2.856253   0.861081   3.317 0.000926 ***
## race.ethnicity.5levelOther    2.929340   0.989325   2.961 0.003103 **
## race.ethnicity.5levelWhite    2.150420   0.810173   2.654 0.008010 **
## demo_race_hispanic1          0.005966   0.337119   0.018 0.985883
## interview_age              0.002089   0.015740   0.133 0.894431
## PDS_score:putamen_posvsneg_feedback_z 0.334041   0.243549   1.372 0.170354
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0108
## lmer.REML = 12422  Scale est. = 17.593    n = 2028
```

## 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.92052   2.08082   2.365 0.018140 *
## PDS_score       0.68518   0.17862   3.836 0.000129 ***
## lOFC_posvsneg_feedback_z -0.67670   0.57385  -1.179 0.238452
## race.ethnicity.5levelBlack    0.54472   0.88932   0.613 0.540267
## race.ethnicity.5levelMixed    2.21866   0.87231   2.543 0.011052 *
## race.ethnicity.5levelOther    2.47787   0.99339   2.494 0.012699 *
## race.ethnicity.5levelWhite    1.30039   0.82024   1.585 0.113041
## demo_race_hispanic1          0.41769   0.34743   1.202 0.229419
## interview_age              -0.02219   0.01632  -1.360 0.173911
## PDS_score:lOFC_posvsneg_feedback_z 0.26950   0.31121   0.866 0.386604
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0134
## lmer.REML = 12272  Scale est. = 11.19      n = 1994
```

#### Males

```
##
## 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.979171   1.992072   0.492 0.623102
## PDS_score       0.705574   0.230936   3.055 0.002278 **
## lOFC_posvsneg_feedback_z -0.260592   0.564728  -0.461 0.644528
## race.ethnicity.5levelBlack  1.164644   0.863426   1.349 0.177532
## race.ethnicity.5levelMixed  2.820399   0.852772   3.307 0.000958 ***
## race.ethnicity.5levelOther  2.748041   0.983799   2.793 0.005267 **
## race.ethnicity.5levelWhite  2.053822   0.801858   2.561 0.010499 *
## demo_race_hispanic1 -0.004806   0.333205  -0.014 0.988495
## interview_age    0.006403   0.015580   0.411 0.681151
## PDS_score:lOFC_posvsneg_feedback_z 0.221057   0.382530   0.578 0.563408
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00919
## lmer.REML = 12384  Scale est. = 17.008      n = 2029
```

### 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.04965   2.08298   2.424 0.01543 *
## PDS_score       0.68950   0.17888   3.855 0.00012 ***
## mOFC_posvsneg_feedback_z -0.69715   0.48406  -1.440 0.14996
## race.ethnicity.5levelBlack  0.53721   0.89106   0.603 0.54665
## race.ethnicity.5levelMixed  2.19349   0.87432   2.509 0.01219 *
```

```
## race.ethnicity.5levelOther      2.30312    0.98997    2.326 0.02009 *
## race.ethnicity.5levelWhite      1.28148    0.82167    1.560 0.11901
## demo_race_hispanic1             0.46194    0.34777    1.328 0.18423
## interview_age                   -0.02318    0.01634   -1.419 0.15610
## PDS_score:mOFC_posvsneg_feedback_z 0.30275    0.26566    1.140 0.25459
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0142
## lmer.REML = 12281  Scale est. = 11.435    n = 1994
```

#### 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.031307   1.991116   0.518 0.604547
## PDS_score       0.708314   0.230857   3.068 0.002182 **
## mOFC_posvsneg_feedback_z -0.061820   0.505986  -0.122 0.902771
## race.ethnicity.5levelBlack  1.158695   0.862802   1.343 0.179441
## race.ethnicity.5levelMixed  2.837685   0.852570   3.328 0.000889 ***
## race.ethnicity.5levelOther  2.807415   0.980892   2.862 0.004252 **
## race.ethnicity.5levelWhite  2.061024   0.801557   2.571 0.010204 *
## demo_race_hispanic1 -0.023184   0.332785  -0.070 0.944465
## interview_age     0.005845   0.015565   0.376 0.707313
## PDS_score:mOFC_posvsneg_feedback_z 0.248273   0.349561   0.710 0.477635
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0108
## lmer.REML = 12371  Scale est. = 17.106    n = 2027
```

### 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)                2.191763    2.099766    1.044    0.29667
## PDS_score                  1.574106    0.551603    2.854    0.00436 **
## bisbas_ss_basm_rr          0.114562    0.111110    1.031    0.30260
## race.ethnicity.5levelBlack 0.201260    0.791776    0.254    0.79937
## race.ethnicity.5levelMixed 1.868473    0.787599    2.372    0.01775 *
## race.ethnicity.5levelOther 2.513910    0.901229    2.789    0.00532 **
## race.ethnicity.5levelWhite 1.340999    0.740403    1.811    0.07023 .
## demo_race_hispanic1        0.164739    0.316995    0.520    0.60332
## interview_age              -0.004925    0.014590   -0.338    0.73572
## PDS_score:bisbas_ss_basm_rr -0.107740    0.059762   -1.803    0.07153 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0132
## lmer.REML = 16324  Scale est. = 13.08      n = 2629
```

#### 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
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.7423551   2.0817585   2.278  0.02280 *
## PDS_score      -0.8680368   0.7884713  -1.101  0.27103
## bisbas_ss_basm_rr -0.2504578   0.1186368  -2.111  0.03485 *
## race.ethnicity.5levelBlack 1.2560711   0.7530189   1.668  0.09542 .
## race.ethnicity.5levelMixed 1.9861319   0.7534441   2.636  0.00843 **
## race.ethnicity.5levelOther 1.8190748   0.8603645   2.114  0.03458 *
## race.ethnicity.5levelWhite 1.4449332   0.7064644   2.045  0.04092 *
## demo_race_hispanic1  0.2504211   0.3008454   0.832  0.40526
## interview_age    -0.0009387   0.0140026  -0.067  0.94656
## PDS_score:bisbas_ss_basm_rr 0.1859961   0.0825012   2.254  0.02424 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00812
## lmer.REML = 17710  Scale est. = 15.557      n = 2847
```

### 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
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.501254   1.992802   2.761 0.005819 **
## PDS_score      0.641957   0.172929   3.712 0.000211 ***
## rt_diff_large_neutral_z 0.154540   0.311198   0.497 0.619524
## race.ethnicity.5levelBlack 0.560716   0.845384   0.663 0.507230
## race.ethnicity.5levelMixed 2.155255   0.833294   2.586 0.009763 **
## race.ethnicity.5levelOther 2.598824   0.947143   2.744 0.006123 **
## race.ethnicity.5levelWhite 1.320738   0.781113   1.691 0.091013 .
## demo_race_hispanic1 0.456433   0.341115   1.338 0.181018
## interview_age -0.026474   0.015690  -1.687 0.091696 .
## PDS_score:rt_diff_large_neutral_z -0.008305   0.171296  -0.048 0.961334
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0132
## lmer.REML = 13258 Scale est. = 11.823    n = 2153
```

## 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
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.437100   1.933083   0.743 0.45730
## PDS_score      0.624857   0.221216   2.825 0.00477 **
## rt_diff_large_neutral_z 0.605151   0.344894   1.755 0.07946 .
## race.ethnicity.5levelBlack 0.739558   0.843849   0.876 0.38090
## race.ethnicity.5levelMixed 2.156381   0.836600   2.578 0.01001 *
## race.ethnicity.5levelOther 2.032814   0.962054   2.113 0.03471 *
## race.ethnicity.5levelWhite 1.469532   0.789459   1.861 0.06281 .
## demo_race_hispanic1 0.100016   0.322811   0.310 0.75672
## interview_age 0.008459   0.015042   0.562 0.57393
## PDS_score:rt_diff_large_neutral_z -0.382233   0.238948  -1.600 0.10982
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0071
## lmer.REML = 13868 Scale est. = 16.958    n = 2257
```



### 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      5.41915    1.99084   2.722 0.006540 **
## PDS_score         0.62916    0.17250   3.647 0.000271 ***
## rt_diff_large_small_z -0.54782    0.29953  -1.829 0.067547 .
## race.ethnicity.5levelBlack 0.56487    0.84371   0.670 0.503246
## race.ethnicity.5levelMixed 2.14230    0.83251   2.573 0.010140 *
## race.ethnicity.5levelOther 2.55705    0.94673   2.701 0.006969 **
## race.ethnicity.5levelWhite 1.29990    0.78025   1.666 0.095859 .
## demo_race_hispanic1 0.45983    0.34088   1.349 0.177498
## interview_age     -0.02539    0.01567  -1.621 0.105253
## PDS_score:rt_diff_large_small_z 0.25824    0.16474   1.568 0.117134
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0143
## lmer.REML = 13256 Scale est. = 11.79    n = 2153
```

#### 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
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.462262    1.934052   0.756 0.44969
## PDS_score         0.628312    0.221085   2.842 0.00452 **
## rt_diff_large_small_z 0.090409    0.345473   0.262 0.79358
## race.ethnicity.5levelBlack 0.694926    0.844009   0.823 0.41039
## race.ethnicity.5levelMixed 2.103226    0.836744   2.514 0.01202 *
## race.ethnicity.5levelOther 1.902684    0.960826   1.980 0.04780 *
## race.ethnicity.5levelWhite 1.409154    0.789449   1.785 0.07440 .
## demo_race_hispanic1 0.097283    0.323145   0.301 0.76340
## interview_age     0.008768    0.015050   0.583 0.56023
## PDS_score:rt_diff_large_small_z -0.119671    0.241539  -0.495 0.62033
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00569
## lmer.REML = 13871  Scale est. = 16.827    n = 2257
```

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

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      accumbens_rvsnt_ant_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.460740    2.119085   2.105 0.035422
## PDS_score         0.665395    0.191155   3.481 0.000511
## hormone_scr_ert_mean 0.002798    0.008101   0.345 0.729815
## accumbens_rvsnt_ant_z 0.182512    0.418879   0.436 0.663094
## race.ethnicity.5levelBlack 0.220171    0.899271   0.245 0.806613
## race.ethnicity.5levelMixed 2.173556    0.878765   2.473 0.013471
## race.ethnicity.5levelOther 2.237816    0.998934   2.240 0.025195
## race.ethnicity.5levelWhite 1.325853    0.823882   1.609 0.107726
## demo_race_hispanic1 0.355402    0.358674   0.991 0.321874
## interview_age     -0.018447    0.016899  -1.092 0.275143
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z -0.006376    0.011134  -0.573 0.566914
##
## (Intercept)      *
## PDS_score         ***
## hormone_scr_ert_mean
## accumbens_rvsnt_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed      *
## race.ethnicity.5levelOther      *
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0115
## lmer.REML = 11518  Scale est. = 10.565    n = 1870
```

##### Males

```
##
```

```

## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      accumbens_rvsnt_ant_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.827481    2.101594   0.394  0.69382
## PDS_score         0.803710    0.247925   3.242  0.00121
## hormone_scr_ert_mean -0.001469    0.008279  -0.177  0.85920
## accumbens_rvsnt_ant_z -0.223974    0.362232  -0.618  0.53644
## race.ethnicity.5levelBlack  1.003326    0.916447   1.095  0.27375
## race.ethnicity.5levelMixed  2.772588    0.901195   3.077  0.00212
## race.ethnicity.5levelOther  2.732707    1.034747   2.641  0.00834
## race.ethnicity.5levelWhite  2.068040    0.847370   2.441  0.01476
## demo_race_hispanic1  0.093109    0.347147   0.268  0.78857
## interview_age      0.007231    0.016641   0.435  0.66395
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z  0.003830    0.010773   0.355  0.72227
##
## (Intercept)
## PDS_score          **
## hormone_scr_ert_mean
## accumbens_rvsnt_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed      **
## race.ethnicity.5levelOther      **
## race.ethnicity.5levelWhite      *
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00989
## lmer.REML = 11513 Scale est. = 17.508    n = 1873

```

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

##### Females

```

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

```

```
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.534882   2.1219447   2.137 0.032717
## PDS_score         0.6845890   0.1914868   3.575 0.000359
## hormone_scr_ert_mean 0.0028676   0.0081083   0.354 0.723629
## caudate_rvsnt_z   -0.0035717   0.3299659  -0.011 0.991365
## race.ethnicity.5levelBlack 0.2633481   0.8995029   0.293 0.769730
## race.ethnicity.5levelMixed 2.1525889   0.8777123   2.452 0.014278
## race.ethnicity.5levelOther 2.2184539   0.9953510   2.229 0.025945
## race.ethnicity.5levelWhite 1.3332409   0.8235547   1.619 0.105642
## demo_race_hispanic1 0.3429821   0.3576367   0.959 0.337672
## interview_age     -0.0193397   0.0169371  -1.142 0.253662
## hormone_scr_ert_mean:caudate_rvsnt_z 0.0001989   0.0087533   0.023 0.981875
##
## (Intercept)      *
## PDS_score         ***
## hormone_scr_ert_mean
## caudate_rvsnt_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed      *
## race.ethnicity.5levelOther      *
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:caudate_rvsnt_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0113
## lmer.REML = 11506 Scale est. = 10.618    n = 1868
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   caudate_rvsnt_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.085264   2.112341   0.514 0.607472
## PDS_score         0.817312   0.247909   3.297 0.000996
## hormone_scr_ert_mean -0.001257   0.008331  -0.151 0.880078
## caudate_rvsnt_z     0.210667   0.287271   0.733 0.463446
## race.ethnicity.5levelBlack 0.898481   0.937823   0.958 0.338162
## race.ethnicity.5levelMixed 2.713893   0.923809   2.938 0.003347
## race.ethnicity.5levelOther 2.659580   1.052711   2.526 0.011606
## race.ethnicity.5levelWhite 1.977981   0.871688   2.269 0.023374
## demo_race_hispanic1 0.092823   0.349225   0.266 0.790425
```

```
## interview_age                0.005767    0.016687    0.346 0.729694
## hormone_scr_ert_mean:caudate_rvsnt_z -0.009248    0.008064   -1.147 0.251597
##
## (Intercept)
## PDS_score                    ***
## hormone_scr_ert_mean
## caudate_rvsnt_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed    **
## race.ethnicity.5levelOther    *
## race.ethnicity.5levelWhite    *
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:caudate_rvsnt_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0103
## lmer.REML = 11507  Scale est. = 17.744    n = 1871
```

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

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      putamen_rvsnt_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.341820    2.117114   2.051 0.040425
## PDS_score       0.685162    0.191490   3.578 0.000355
## hormone_scr_ert_mean 0.001752    0.008077   0.217 0.828324
## putamen_rvsnt_z -0.194659    0.331833  -0.587 0.557532
## race.ethnicity.5levelBlack 0.318982    0.895454   0.356 0.721714
## race.ethnicity.5levelMixed 2.189852    0.874549   2.504 0.012366
## race.ethnicity.5levelOther 2.243043    0.994948   2.254 0.024285
## race.ethnicity.5levelWhite 1.316069    0.820336   1.604 0.108817
## demo_race_hispanic1  0.361351    0.357142   1.012 0.311772
## interview_age    -0.017509    0.016893  -1.036 0.300127
## hormone_scr_ert_mean:putamen_rvsnt_z 0.004550    0.008692   0.523 0.600715
##
## (Intercept)      *
## PDS_score        ***
## hormone_scr_ert_mean
## putamen_rvsnt_z
## race.ethnicity.5levelBlack
```

```
## race.ethnicity.5levelMixed          *
## race.ethnicity.5levelOther          *
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:putamen_rvsnt_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0114
## lmer.REML = 11482  Scale est. = 10.569    n = 1866
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      putamen_rvsnt_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.934510   2.107235   0.443 0.657473
## PDS_score       0.833556   0.248783   3.351 0.000823
## hormone_scr_ert_mean -0.001062   0.008318  -0.128 0.898383
## putamen_rvsnt_z    0.361272   0.284515   1.270 0.204322
## race.ethnicity.5levelBlack    0.931856   0.936204   0.995 0.319693
## race.ethnicity.5levelMixed    2.713552   0.919864   2.950 0.003218
## race.ethnicity.5levelOther    2.461640   1.054510   2.334 0.019681
## race.ethnicity.5levelWhite    1.962977   0.869640   2.257 0.024109
## demo_race_hispanic1    0.054678   0.348490   0.157 0.875342
## interview_age    0.007025   0.016652   0.422 0.673168
## hormone_scr_ert_mean:putamen_rvsnt_z -0.015096   0.007797  -1.936 0.053022
##
## (Intercept)
## PDS_score          ***
## hormone_scr_ert_mean
## putamen_rvsnt_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed    **
## race.ethnicity.5levelOther    *
## race.ethnicity.5levelWhite    *
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:putamen_rvsnt_z .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0113
```

```
## lmer.REML = 11495 Scale est. = 17.146 n = 1871
```

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

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   accumbens_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##                                     Estimate Std. Error t value
## (Intercept)                       4.189255    2.110672   1.985
## PDS_score                          0.677795    0.190161   3.564
## hormone_scr_ert_mean                0.002331    0.008078   0.289
## accumbens_posvsneg_feedback_z      0.319909    0.465170   0.688
## race.ethnicity.5levelBlack          0.284555    0.894195   0.318
## race.ethnicity.5levelMixed          2.101703    0.874015   2.405
## race.ethnicity.5levelOther          2.296337    0.991434   2.316
## race.ethnicity.5levelWhite          1.361645    0.820086   1.660
## demo_race_hispanic1                 0.271252    0.357796   0.758
## interview_age                     -0.016437    0.016839  -0.976
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z -0.010360    0.012227  -0.847
##                                     Pr(>|t|)
## (Intercept)                       0.047314 *
## PDS_score                          0.000374 ***
## hormone_scr_ert_mean                0.772937
## accumbens_posvsneg_feedback_z      0.491712
## race.ethnicity.5levelBlack          0.750350
## race.ethnicity.5levelMixed          0.016285 *
## race.ethnicity.5levelOther          0.020657 *
## race.ethnicity.5levelWhite          0.097009 .
## demo_race_hispanic1                 0.448475
## interview_age                       0.329146
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z 0.396926
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) = 0.0107
## lmer.REML = 11518 Scale est. = 10.473 n = 1873
```

##### Males

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

```

## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   accumbens_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      0.656423   2.086433   0.315
## PDS_score         0.765509   0.245555   3.117
## hormone_scr_ert_mean -0.002612  0.008365  -0.312
## accumbens_posvsneg_feedback_z  0.304056  0.375225   0.810
## race.ethnicity.5levelBlack    1.112216  0.908426   1.224
## race.ethnicity.5levelMixed    2.833993  0.891611   3.179
## race.ethnicity.5levelOther    2.908731  1.024126   2.840
## race.ethnicity.5levelWhite    2.084747  0.838662   2.486
## demo_race_hispanic1          0.062542  0.345129   0.181
## interview_age              0.008752  0.016534   0.529
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z  0.001400  0.010561   0.133
##
##               Pr(>|t|)
## (Intercept)      0.75309
## PDS_score         0.00185 **
## hormone_scr_ert_mean  0.75491
## accumbens_posvsneg_feedback_z  0.41785
## race.ethnicity.5levelBlack    0.22098
## race.ethnicity.5levelMixed    0.00150 **
## race.ethnicity.5levelOther    0.00456 **
## race.ethnicity.5levelWhite    0.01301 *
## demo_race_hispanic1          0.85622
## interview_age              0.59665
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z  0.89454
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0113
## lmer.REML = 11454  Scale est. = 18.024    n = 1869

```

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

##### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   caudate_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      4.554e+00  2.125e+00   2.143
## PDS_score         7.006e-01  1.917e-01   3.656

```



```

## hormone_scr_ert_mean                2.420e-03  8.112e-03  0.298
## caudate_posvsneg_feedback_z        -1.997e-01  3.265e-01 -0.612
## race.ethnicity.5levelBlack          2.948e-01  8.991e-01  0.328
## race.ethnicity.5levelMixed          2.101e+00  8.768e-01  2.396
## race.ethnicity.5levelOther          2.103e+00  9.960e-01  2.112
## race.ethnicity.5levelWhite          1.291e+00  8.229e-01  1.569
## demo_race_hispanic1                3.428e-01  3.598e-01  0.953
## interview_age                      -1.950e-02  1.697e-02 -1.149
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z -8.056e-06  8.468e-03 -0.001
##                                     Pr(>|t|)
## (Intercept)                        0.032269 *
## PDS_score                          0.000264 ***
## hormone_scr_ert_mean                0.765486
## caudate_posvsneg_feedback_z        0.540722
## race.ethnicity.5levelBlack          0.743000
## race.ethnicity.5levelMixed          0.016683 *
## race.ethnicity.5levelOther          0.034831 *
## race.ethnicity.5levelWhite          0.116767
## demo_race_hispanic1                0.340801
## interview_age                      0.250598
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.999241
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0122
## lmer.REML = 11483  Scale est. = 10.562    n = 1865

```

## Males

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   caudate_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##                                     Estimate Std. Error t value
## (Intercept)                    1.3853505  2.1141365  0.655
## PDS_score                      0.8405454  0.2482247  3.386
## hormone_scr_ert_mean           -0.0003595  0.0083567 -0.043
## caudate_posvsneg_feedback_z    0.0394485  0.3248035  0.121
## race.ethnicity.5levelBlack     0.9893125  0.9257562  1.069
## race.ethnicity.5levelMixed     2.7620204  0.9104401  3.034
## race.ethnicity.5levelOther     2.7653144  1.0394684  2.660
## race.ethnicity.5levelWhite     2.0516687  0.8573196  2.393
## demo_race_hispanic1            0.1355263  0.3485331  0.389
## interview_age                  0.0018915  0.0166800  0.113
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.0037307  0.0092346  0.404
##                                     Pr(>|t|)
## (Intercept)                    0.512369

```

```

## PDS_score 0.000723 ***
## hormone_scr_ert_mean 0.965687
## caudate_posvsneg_feedback_z 0.903345
## race.ethnicity.5levelBlack 0.285365
## race.ethnicity.5levelMixed 0.002449 **
## race.ethnicity.5levelOther 0.007874 **
## race.ethnicity.5levelWhite 0.016804 *
## demo_race_hispanic1 0.697433
## interview_age 0.909724
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.686270
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0103
## lmer.REML = 11503 Scale est. = 17.709 n = 1871

```

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

##### Females

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      putamen_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
## Estimate Std. Error t value
## (Intercept) 4.287337 2.120112 2.022
## PDS_score 0.674074 0.191044 3.528
## hormone_scr_ert_mean 0.002856 0.008144 0.351
## putamen_posvsneg_feedback_z -0.057460 0.364195 -0.158
## race.ethnicity.5levelBlack 0.353506 0.899655 0.393
## race.ethnicity.5levelMixed 2.143254 0.876523 2.445
## race.ethnicity.5levelOther 2.180848 0.997524 2.186
## race.ethnicity.5levelWhite 1.325057 0.823209 1.610
## demo_race_hispanic1 0.360481 0.359323 1.003
## interview_age -0.017350 0.016925 -1.025
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -0.003165 0.009367 -0.338
##
## Pr(>|t|)
## (Intercept) 0.043297 *
## PDS_score 0.000428 ***
## hormone_scr_ert_mean 0.725826
## putamen_posvsneg_feedback_z 0.874653
## race.ethnicity.5levelBlack 0.694413
## race.ethnicity.5levelMixed 0.014571 *
## race.ethnicity.5levelOther 0.028921 *
## race.ethnicity.5levelWhite 0.107650
## demo_race_hispanic1 0.315884

```

```
## interview_age 0.305453
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z 0.735491
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0116
## lmer.REML = 11483  Scale est. = 10.565    n = 1865
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      putamen_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value
## (Intercept)  0.9611155  2.1101773   0.455
## PDS_score    0.8176842  0.2484107   3.292
## hormone_scr_ert_mean 0.0002681  0.0083787   0.032
## putamen_posvsneg_feedback_z 0.3306721  0.3251871   1.017
## race.ethnicity.5levelBlack 1.0236441  0.9185222   1.114
## race.ethnicity.5levelMixed 2.8148709  0.9028527   3.118
## race.ethnicity.5levelOther 2.8319892  1.0337642   2.739
## race.ethnicity.5levelWhite 2.1176635  0.8496222   2.492
## demo_race_hispanic1 0.0681445  0.3504727   0.194
## interview_age 0.0051637  0.0166850   0.309
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -0.0049109  0.0091615  -0.536
##
##              Pr(>|t|)
## (Intercept)  0.64883
## PDS_score    0.00101 **
## hormone_scr_ert_mean 0.97447
## putamen_posvsneg_feedback_z 0.30935
## race.ethnicity.5levelBlack 0.26523
## race.ethnicity.5levelMixed 0.00185 **
## race.ethnicity.5levelOther 0.00621 **
## race.ethnicity.5levelWhite 0.01277 *
## demo_race_hispanic1 0.84586
## interview_age 0.75699
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z 0.59200
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0101
## lmer.REML = 11552  Scale est. = 17.82    n = 1877
```

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

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   lOFC_rvs_n_ant_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.386035   2.139491   2.050 0.040501 *
## PDS_score       0.658410   0.191838   3.432 0.000612 ***
## hormone_scr_ert_mean 0.003086   0.008159   0.378 0.705274
## lOFC_rvs_n_ant_z 0.330589   0.491379   0.673 0.501172
## race.ethnicity.5levelBlack 0.227744   0.906920   0.251 0.801751
## race.ethnicity.5levelMixed 2.115228   0.887612   2.383 0.017270 *
## race.ethnicity.5levelOther 2.179843   1.007403   2.164 0.030605 *
## race.ethnicity.5levelWhite 1.276544   0.832855   1.533 0.125512
## demo_race_hispanic1 0.358385   0.359093   0.998 0.318396
## interview_age   -0.017460   0.017050  -1.024 0.305924
## hormone_scr_ert_mean:lOFC_rvs_n_ant_z -0.007097   0.012725  -0.558 0.577086
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0109
## lmer.REML = 11483  Scale est. = 10.83    n = 1864
```

### Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   lOFC_rvs_n_ant_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.143556   2.082627   0.069 0.94505
## PDS_score       0.732637   0.247926   2.955 0.00317 **
## hormone_scr_ert_mean -0.003482   0.008272  -0.421 0.67386
## lOFC_rvs_n_ant_z 0.319893   0.424799   0.753 0.45152
## race.ethnicity.5levelBlack 0.983069   0.907154   1.084 0.27865
## race.ethnicity.5levelMixed 2.709157   0.891327   3.039 0.00240 **
## race.ethnicity.5levelOther 2.662592   1.023037   2.603 0.00932 **
## race.ethnicity.5levelWhite 1.966634   0.837446   2.348 0.01896 *
```

```
## demo_race_hispanic1          -0.020222    0.345180   -0.059   0.95329
## interview_age                 0.014830    0.016517    0.898   0.36937
## hormone_scr_ert_mean:lOFC_rvsnt_z -0.011983    0.012283   -0.976   0.32939
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00876
## lmer.REML = 11454 Scale est. = 17.139    n = 1870
```

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

##### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   mOFC_rvsnt_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.202280   2.132609   1.970 0.048931 *
## PDS_score       0.676571   0.191614   3.531 0.000424 ***
## hormone_scr_ert_mean 0.002583   0.008127   0.318 0.750694
## mOFC_rvsnt_z    0.063317   0.437193   0.145 0.884864
## race.ethnicity.5levelBlack 0.216029   0.906342   0.238 0.811634
## race.ethnicity.5levelMixed 2.115741   0.887454   2.384 0.017223 *
## race.ethnicity.5levelOther 2.218632   1.008524   2.200 0.027938 *
## race.ethnicity.5levelWhite 1.295692   0.832708   1.556 0.119879
## demo_race_hispanic1 0.351711   0.358836   0.980 0.327142
## interview_age   -0.016049   0.016989  -0.945 0.344951
## hormone_scr_ert_mean:mOFC_rvsnt_z 0.002991   0.011334   0.264 0.791898
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0115
## lmer.REML = 11480 Scale est. = 10.572    n = 1864
```

##### Males

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

```
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3794183   2.0930053   0.181  0.85617
## PDS_score         0.7418269   0.2477609   2.994  0.00279 **
## hormone_scr_ert_mean -0.0047195   0.0082694  -0.571  0.56826
## mOFC_rvs_n_ant_z   0.2166666   0.3858311   0.562  0.57449
## race.ethnicity.5levelBlack 1.0066068   0.9112426   1.105  0.26945
## race.ethnicity.5levelMixed 2.6544268   0.8948998   2.966  0.00305 **
## race.ethnicity.5levelOther 2.6516682   1.0247281   2.588  0.00974 **
## race.ethnicity.5levelWhite 1.9777066   0.8411090   2.351  0.01881 *
## demo_race_hispanic1  0.0431677   0.3460332   0.125  0.90073
## interview_age      0.0130179   0.0165828   0.785  0.43254
## hormone_scr_ert_mean:mOFC_rvs_n_ant_z -0.0003209   0.0108689  -0.030  0.97645
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00947
## lmer.REML = 11431 Scale est. = 17.29    n = 1864
```

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

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   lOFC_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      4.334290   2.117637   2.047
## PDS_score         0.673271   0.190513   3.534
## hormone_scr_ert_mean 0.001130   0.008091   0.140
## lOFC_posvsneg_feedback_z 0.550378   0.567460   0.970
## race.ethnicity.5levelBlack 0.298496   0.894428   0.334
## race.ethnicity.5levelMixed 2.147933   0.873735   2.458
## race.ethnicity.5levelOther 2.515196   0.999082   2.518
## race.ethnicity.5levelWhite 1.364823   0.819389   1.666
## demo_race_hispanic1  0.238185   0.357406   0.666
## interview_age     -0.017253   0.016901  -1.021
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z -0.019692   0.014952  -1.317
##
##               Pr(>|t|)
## (Intercept)      0.040823 *
## PDS_score         0.000419 ***
## hormone_scr_ert_mean 0.888980
## lOFC_posvsneg_feedback_z 0.332224
## race.ethnicity.5levelBlack 0.738622
## race.ethnicity.5levelMixed 0.014049 *
```

```
## race.ethnicity.5levelOther          0.011903 *
## race.ethnicity.5levelWhite          0.095950 .
## demo_race_hispanic1                 0.505222
## interview_age                       0.307481
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z 0.188010
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0128
## lmer.REML = 11471  Scale est. = 10.543    n = 1865
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   lOFC_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value
## (Intercept)                  0.708612   2.083849   0.340
## PDS_score                    0.780740   0.246067   3.173
## hormone_scr_ert_mean         -0.003771   0.008293  -0.455
## lOFC_posvsneg_feedback_z     0.082718   0.469392   0.176
## race.ethnicity.5levelBlack    1.065934   0.909266   1.172
## race.ethnicity.5levelMixed    2.800502   0.892576   3.138
## race.ethnicity.5levelOther    2.630253   1.028645   2.557
## race.ethnicity.5levelWhite    2.031878   0.839607   2.420
## demo_race_hispanic1          0.054049   0.346076   0.156
## interview_age                 0.009165   0.016504   0.555
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z 0.001315   0.013021   0.101
##                                Pr(>|t|)
## (Intercept)                  0.73386
## PDS_score                    0.00153 **
## hormone_scr_ert_mean         0.64939
## lOFC_posvsneg_feedback_z     0.86014
## race.ethnicity.5levelBlack    0.24123
## race.ethnicity.5levelMixed    0.00173 **
## race.ethnicity.5levelOther    0.01064 *
## race.ethnicity.5levelWhite    0.01561 *
## demo_race_hispanic1          0.87591
## interview_age                 0.57873
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z 0.91958
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00915
## lmer.REML = 11513  Scale est. = 17.224    n = 1878
```

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

### Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      mOFC_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value
## (Intercept)                  4.369334   2.116941   2.064
## PDS_score                    0.684020   0.190714   3.587
## hormone_scr_ert_mean         0.002015   0.008095   0.249
## mOFC_posvsneg_feedback_z     0.562287   0.484833   1.160
## race.ethnicity.5levelBlack   0.271402   0.896065   0.303
## race.ethnicity.5levelMixed   2.143308   0.874392   2.451
## race.ethnicity.5levelOther   2.290652   0.993534   2.306
## race.ethnicity.5levelWhite   1.335606   0.819977   1.629
## demo_race_hispanic1         0.315052   0.357365   0.882
## interview_age                -0.017840   0.016903  -1.055
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z -0.019533   0.012998  -1.503
##                                Pr(>|t|)
## (Intercept)                  0.039158 *
## PDS_score                    0.000344 ***
## hormone_scr_ert_mean         0.803458
## mOFC_posvsneg_feedback_z     0.246298
## race.ethnicity.5levelBlack   0.762013
## race.ethnicity.5levelMixed   0.014330 *
## race.ethnicity.5levelOther   0.021245 *
## race.ethnicity.5levelWhite   0.103518
## demo_race_hispanic1         0.378109
## interview_age                0.291362
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z 0.133070
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0133
## lmer.REML = 11481  Scale est. = 10.705    n = 1866
```

### Males

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



```
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value
## (Intercept)      0.698369   2.080425   0.336
## PDS_score         0.787679   0.246180   3.200
## hormone_scr_ert_mean -0.003648   0.008294  -0.440
## mOFC_posvsneg_feedback_z 0.534975   0.419242   1.276
## race.ethnicity.5levelBlack 1.032102   0.908791   1.136
## race.ethnicity.5levelMixed 2.828046   0.892475   3.169
## race.ethnicity.5levelOther 2.683977   1.025478   2.617
## race.ethnicity.5levelWhite 2.028699   0.839404   2.417
## demo_race_hispanic1 0.025745   0.345377   0.075
## interview_age      0.009149   0.016473   0.555
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z -0.006684   0.012015  -0.556
##
##              Pr(>|t|)
## (Intercept)      0.73715
## PDS_score         0.00140 **
## hormone_scr_ert_mean 0.66016
## mOFC_posvsneg_feedback_z 0.20210
## race.ethnicity.5levelBlack 0.25623
## race.ethnicity.5levelMixed 0.00156 **
## race.ethnicity.5levelOther 0.00893 **
## race.ethnicity.5levelWhite 0.01575 *
## demo_race_hispanic1 0.94059
## interview_age      0.57869
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z 0.57807
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0111
## lmer.REML = 11500 Scale est. = 17.336    n = 1876
```

#### 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_scr_ert_mean *
##      bisbas_ss_basm_rr + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.020293   2.129138   1.419 0.156158
## PDS_score         0.626624   0.169756   3.691 0.000228
## hormone_scr_ert_mean -0.009565   0.025287  -0.378 0.705274
## bisbas_ss_basm_rr   -0.084205   0.110618  -0.761 0.446597
## race.ethnicity.5levelBlack -0.041861   0.799020  -0.052 0.958222
## race.ethnicity.5levelMixed  1.640258   0.791942   2.071 0.038447
```

```
## race.ethnicity.5levelOther      2.486882    0.909634    2.734 0.006304
## race.ethnicity.5levelWhite      1.312543    0.742548    1.768 0.077250
## demo_race_hispanic1             0.027915    0.326365    0.086 0.931844
## interview_age                   0.003614    0.015214    0.238 0.812240
## hormone_scr_ert_mean:bisbas_ss_basm_rr 0.001030    0.002812    0.366 0.714173
##
## (Intercept)
## PDS_score                        ***
## 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
## hormone_scr_ert_mean:bisbas_ss_basm_rr
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.011
## lmer.REML = 15183  Scale est. = 12.902    n = 2443
```

## Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##     bisbas_ss_basm_rr + race.ethnicity.5level + demo_race_hispanic +
##     interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.9448720  2.0990033   1.403   0.1607
## PDS_score       0.9727679  0.2130504   4.566 5.2e-06
## hormone_scr_ert_mean -0.0077391  0.0275009  -0.281   0.7784
## bisbas_ss_basm_rr  -0.0374799  0.1024260  -0.366   0.7145
## race.ethnicity.5levelBlack    1.2176099  0.7861775   1.549   0.1216
## race.ethnicity.5levelMixed    1.9522652  0.7835021   2.492   0.0128
## race.ethnicity.5levelOther    1.6180798  0.9000651   1.798   0.0723
## race.ethnicity.5levelWhite    1.4443559  0.7343462   1.967   0.0493
## demo_race_hispanic1    0.3039554  0.3133667   0.970   0.3322
## interview_age    -0.0030757  0.0148819  -0.207   0.8363
## hormone_scr_ert_mean:bisbas_ss_basm_rr 0.0007827  0.0029404   0.266   0.7901
##
## (Intercept)
## PDS_score                        ***
## 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
## hormone_scr_ert_mean:bisbas_ss_basm_rr
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00648
## lmer.REML = 16521  Scale est. = 16.034    n = 2641
```

#### 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_scr_ert_mean *
##   rt_diff_large_neutral_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      4.907852   2.030911   2.417
## PDS_score         0.640866   0.184675   3.470
## hormone_scr_ert_mean 0.002747   0.007808   0.352
## rt_diff_large_neutral_z -0.234637   0.297943  -0.788
## race.ethnicity.5levelBlack 0.234371   0.848919   0.276
## race.ethnicity.5levelMixed 2.018688   0.835051   2.417
## race.ethnicity.5levelOther 2.518939   0.951958   2.646
## race.ethnicity.5levelWhite 1.333646   0.780222   1.709
## demo_race_hispanic1 0.310120   0.350440   0.885
## interview_age    -0.021805   0.016262  -1.341
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.010522   0.007540   1.395
##
##               Pr(>|t|)
## (Intercept)      0.015756 *
## PDS_score         0.000531 ***
## hormone_scr_ert_mean 0.725032
## rt_diff_large_neutral_z 0.431069
## race.ethnicity.5levelBlack 0.782514
## race.ethnicity.5levelMixed 0.015719 *
## race.ethnicity.5levelOther 0.008207 **
## race.ethnicity.5levelWhite 0.087547 .
## demo_race_hispanic1 0.376293
## interview_age    0.180119
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.163025
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.0141
## lmer.REML = 12398 Scale est. = 11.344 n = 2014

Males

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
## rt_diff_large_neutral_z + race.ethnicity.5level + demo_race_hispanic +
## interview_age
##
## Parametric coefficients:
##
## Estimate Std. Error t value
## (Intercept) 1.417e+00 2.019e+00 0.702
## PDS_score 7.079e-01 2.365e-01 2.994
## hormone_scr_ert_mean 3.882e-05 7.949e-03 0.005
## rt_diff_large_neutral_z 4.941e-01 2.912e-01 1.697
## race.ethnicity.5levelBlack 6.221e-01 8.861e-01 0.702
## race.ethnicity.5levelMixed 2.099e+00 8.748e-01 2.399
## race.ethnicity.5levelOther 1.774e+00 1.003e+00 1.769
## race.ethnicity.5levelWhite 1.389e+00 8.256e-01 1.683
## demo_race_hispanic1 1.517e-01 3.361e-01 0.451
## interview_age 8.579e-03 1.592e-02 0.539
## hormone_scr_ert_mean:rt_diff_large_neutral_z -9.990e-03 8.000e-03 -1.249
##
## Pr(>|t|)
## (Intercept) 0.48275
## PDS_score 0.00279 **
## hormone_scr_ert_mean 0.99610
## rt_diff_large_neutral_z 0.08994 .
## race.ethnicity.5levelBlack 0.48278
## race.ethnicity.5levelMixed 0.01651 *
## race.ethnicity.5levelOther 0.07711 .
## race.ethnicity.5levelWhite 0.09253 .
## demo_race_hispanic1 0.65185
## interview_age 0.58996
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.21194
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0066
## lmer.REML = 12948 Scale est. = 17.517 n = 2097
```

#### 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_scr_ert_mean *
##   rt_diff_large_small_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      4.831194   2.029794   2.380
## PDS_score         0.653073   0.184699   3.536
## hormone_scr_ert_mean 0.001929  0.007810   0.247
## rt_diff_large_small_z -0.398204  0.291988  -1.364
## race.ethnicity.5levelBlack 0.219698  0.848951   0.259
## race.ethnicity.5levelMixed 2.006919  0.835252   2.403
## race.ethnicity.5levelOther 2.487240  0.952491   2.611
## race.ethnicity.5levelWhite 1.329151  0.780631   1.703
## demo_race_hispanic1 0.281757  0.350482   0.804
## interview_age    -0.020947  0.016244  -1.289
## hormone_scr_ert_mean:rt_diff_large_small_z 0.007625  0.007555   1.009
##
##               Pr(>|t|)
## (Intercept)      0.017399 *
## PDS_score         0.000416 ***
## hormone_scr_ert_mean 0.804974
## rt_diff_large_small_z 0.172793
## race.ethnicity.5levelBlack 0.795825
## race.ethnicity.5levelMixed 0.016362 *
## race.ethnicity.5levelOther 0.009087 **
## race.ethnicity.5levelWhite 0.088786 .
## demo_race_hispanic1 0.421543
## interview_age     0.197374
## hormone_scr_ert_mean:rt_diff_large_small_z 0.312973
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0132
## lmer.REML = 12399  Scale est. = 11.209    n = 2014

```

## Males

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   rt_diff_large_small_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      1.490e+00  2.021e+00   0.737
## PDS_score         6.957e-01  2.364e-01   2.943

```

```

## hormone_scr_ert_mean -1.804e-05 7.958e-03 -0.002
## rt_diff_large_small_z -3.445e-02 2.898e-01 -0.119
## race.ethnicity.5levelBlack 5.962e-01 8.868e-01 0.672
## race.ethnicity.5levelMixed 2.051e+00 8.751e-01 2.343
## race.ethnicity.5levelOther 1.703e+00 1.004e+00 1.697
## race.ethnicity.5levelWhite 1.352e+00 8.260e-01 1.637
## demo_race_hispanic1 1.438e-01 3.362e-01 0.428
## interview_age 8.480e-03 1.594e-02 0.532
## hormone_scr_ert_mean:rt_diff_large_small_z -6.380e-04 8.294e-03 -0.077
## Pr(>|t|)
## (Intercept) 0.46128
## PDS_score 0.00329 **
## hormone_scr_ert_mean 0.99819
## rt_diff_large_small_z 0.90539
## race.ethnicity.5levelBlack 0.50146
## race.ethnicity.5levelMixed 0.01921 *
## race.ethnicity.5levelOther 0.08992 .
## race.ethnicity.5levelWhite 0.10178
## demo_race_hispanic1 0.66891
## interview_age 0.59480
## hormone_scr_ert_mean:rt_diff_large_small_z 0.93869
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00521
## lmer.REML = 12951 Scale est. = 17.541 n = 2097

```