

# Supplement A

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

## Contents

<b>Results for Sample 1</b>	<b>8</b>
<b>1—Internalizing~Puberty—</b>	<b>9</b>
1.1 Model: CBCL internalizing factor ~ PDS . . . . .	9
Female participants . . . . .	9
Male participants . . . . .	9
1.2 Model: CBCL Anxious-Depressed ~ PDS . . . . .	10
Female participants . . . . .	10
Male participants . . . . .	11
1.3 Model: CBCL Withdrawn-Depressed ~ PDS . . . . .	11
Female participants . . . . .	11
Male participants . . . . .	12
1.4 Model: CBCL Depressed DSM-5 ~ PDS . . . . .	13
Female participants . . . . .	13
Male participants . . . . .	14
1.5 Model: CBCL internalizing factor ~ Pubertal category . . . . .	14
Female participants . . . . .	14
Male participants . . . . .	15
1.6 Model: CBCL Anxious-Depressed ~ Pubertal category . . . . .	16
Female participants . . . . .	16
Male participants . . . . .	17
1.7 Model: CBCL Withdrawn-Depressed ~ Pubertal category . . . . .	18
Female participants . . . . .	18
Male participants . . . . .	18
1.8 Model: CBCL Depressed DSM-5 ~ Pubertal category . . . . .	19
Female participants . . . . .	19
Male participants . . . . .	20

1.9 Model: CBCL internalizing factor $\sim$ Testosterone . . . . .	21
Female participants . . . . .	21
Male participants . . . . .	21
1.10 Model: CBCL Anxious-Depressed $\sim$ Testosterone . . . . .	22
Female participants . . . . .	22
Male participants . . . . .	23
1.11 Model: CBCL Withdrawn-Depressed $\sim$ Testosterone . . . . .	24
Female participants . . . . .	24
Male participants . . . . .	24
1.12 Model: CBCL Depressed DSM-5 $\sim$ Testosterone . . . . .	25
Female participants . . . . .	25
Male participants . . . . .	26
1.13 Model: CBCL internalizing factor $\sim$ Testosterone + PDS . . . . .	27
Female participants . . . . .	27
Male participants . . . . .	27
1.14 Model: CBCL internalizing factor $\sim$ Testosterone + Pubertal category . . . . .	28
Female participants . . . . .	28
Male participants . . . . .	29
1.15 Model: CBCL Anxious-Depressed $\sim$ Testosterone + PDS . . . . .	30
Female participants . . . . .	30
Male participants . . . . .	30
1.16 Model: CBCL Anxious-Depressed $\sim$ Testosterone + Pubertal category . . . . .	31
Female participants . . . . .	31
Male participants . . . . .	32
1.17 Model: CBCL Withdrawn-Depressed $\sim$ Testosterone + PDS . . . . .	33
Female participants . . . . .	33
Male participants . . . . .	34
1.18 Model: CBCL Withdrawn-Depressed $\sim$ Testosterone + Pubertal category . . . . .	34
Female participants . . . . .	34
Male participants . . . . .	35
1.19 Model: CBCL Depressed DSM-5 $\sim$ Testosterone + PDS . . . . .	36
Female participants . . . . .	36
Male participants . . . . .	37
1.20 Model: CBCL Depressed DSM-5 $\sim$ Testosterone + Pubertal category . . . . .	38
Female participants . . . . .	38
Male participants . . . . .	38

<b>2—Reward~Puberty—</b>	<b>40</b>
2.1 Model: BIS-BAS-RR ~ PDS . . . . .	40
Female participants . . . . .	40
Male participants . . . . .	40
2.2 Model : Reaction Time ~ PDS . . . . .	41
Female participants . . . . .	41
Male participants . . . . .	42
2.3 Model: Caudate Anticipation ~ PDS . . . . .	42
Female participants . . . . .	42
Male participants . . . . .	43
2.4 Model B: Putamen Anticipation ~ PDS . . . . .	43
Female participants . . . . .	43
Male participants . . . . .	44
2.5 Model: Accumbens Anticipation ~ PDS . . . . .	44
Female participants . . . . .	44
Male participants . . . . .	45
2.6 Model: Caudate Feedback ~ PDS . . . . .	45
Female participants . . . . .	45
Male participants . . . . .	46
2.7 Model: Putamen Feedback ~ PDS . . . . .	46
Female participants . . . . .	46
Male participants . . . . .	47
2.8 Model: Accumbens Feedback ~ PDS . . . . .	47
Female participants . . . . .	47
Male participants . . . . .	48
2.9 Model: OFC Anticipation ~ PDS . . . . .	48
Female participants . . . . .	48
Male participants . . . . .	49
2.10 Model: OFC Feedback ~ PDS . . . . .	50
Female participants . . . . .	50
Male participants . . . . .	51
2.11 Model: Caudate Anticipation ~ Testosterone . . . . .	52
Female participants . . . . .	52
Male participants . . . . .	53
2.12 Model B: Putamen Anticipation ~ Testosterone . . . . .	53
Female participants . . . . .	53

Male participants . . . . .	53
2.13 Model: Accumbens Anticipation ~ Testosterone . . . . .	54
Female participants . . . . .	54
Male participants . . . . .	54
2.14 Model: Caudate Feedback ~ Testosterone . . . . .	55
Female participants . . . . .	55
Male participants . . . . .	55
2.15 Model: Putamen Feedback ~ Testosterone . . . . .	56
Female participants . . . . .	56
Male participants . . . . .	56
2.16 Model: Accumbens Feedback ~ Testosterone . . . . .	57
Female participants . . . . .	57
Male participants . . . . .	57
2.17 Model: OFC Anticipation ~ Testosterone . . . . .	58
Female participants . . . . .	58
Male participants . . . . .	59
2.18 Model: OFC Feedback ~ Testosterone . . . . .	60
Female participants . . . . .	60
Male participants . . . . .	61
2.19 Model: MID Reaction Time ~ Testosterone . . . . .	62
Female participants . . . . .	62
Male participants . . . . .	63
2.20 Model: BIS-BAS-RR ~ Testosterone . . . . .	63
Female participants . . . . .	63
Male participants . . . . .	64
<b>3—Internalizing~Reward—</b>	<b>65</b>
3.1 Model: CBCL internalizing factor ~ Nucleus Accumbens activity (anticipation stage) . . . . .	65
Female participants . . . . .	65
Male participants . . . . .	65
3.2 Model: CBCL internalizing factor ~ Caudate activity (anticipation stage) . . . . .	66
Female participants . . . . .	66
Male participants . . . . .	66
3.3 Model: CBCL internalizing factor ~ Putamen activity (anticipation stage) . . . . .	67
Female participants . . . . .	67
Male participants . . . . .	67
3.4 Model: CBCL internalizing factor ~ Accumbens activity (feedback stage) . . . . .	68

Female participants . . . . .	68
Male participants . . . . .	68
3.5 Model: CBCL internalizing factor ~ Caudate activity (feedback stage) . . . . .	69
Female participants . . . . .	69
Male participants . . . . .	69
3.6 Model: CBCL internalizing factor ~ Putamen activity (feedback stage) . . . . .	70
Female participants . . . . .	70
Male participants . . . . .	70
3.7 Model: CBCL internalizing factor ~ OFC activity (anticipation stage) . . . . .	71
Female participants . . . . .	71
Male participants . . . . .	72
3.8 Model: CBCL internalizing factor ~ OFC activity (feedback stage) . . . . .	73
Female participants . . . . .	73
Male participants . . . . .	74
3.9 Model: CBCL internalizing factor ~ BIS-BAS-RR . . . . .	75
Female participants . . . . .	75
Male participants . . . . .	75
3.10 Model: CBCL internalizing factor ~ MID Reaction Time . . . . .	76
Female participants . . . . .	76
Male participants . . . . .	77
<b>4—Internalizing~Puberty x Reward—</b>	<b>78</b>
4.1 Model: CBCL internalizing factor ~ PDS x Accumbens activity (anticipation stage) . . . . .	78
Female participants . . . . .	78
Male participants . . . . .	78
4.2 Model: CBCL internalizing factor ~ PDS x Caudate activity (anticipation stage) . . . . .	79
Female participants . . . . .	79
Male participants . . . . .	80
4.3 Model: CBCL internalizing factor ~ PDS x Putamen activity (anticipation stage) . . . . .	81
Female participants . . . . .	81
Male participants . . . . .	82
4.4 Model: CBCL internalizing factor ~ PDS x Lateral OFC activity (anticipation stage) . . . . .	82
Female participants . . . . .	82
Male participants . . . . .	83
4.5 Model: CBCL internalizing factor ~ PDS x Medial OFC activity (anticipation stage) . . . . .	84
Female participants . . . . .	84
Male participants . . . . .	85

4.6 Model: CBCL internalizing factor ~ PDS x Accumbens activity (feedback) . . . . .	86
Female participants . . . . .	86
Male participants . . . . .	87
4.7 Model: CBCL internalizing factor ~ PDS x Caudate activity (feedback) . . . . .	88
Female participants . . . . .	88
Male participants . . . . .	88
4.8 Model: CBCL internalizing factor ~ PDS x Putamen activity (feedback) . . . . .	89
Female participants . . . . .	89
Male participants . . . . .	90
4.9 Model: CBCL internalizing factor ~ PDS x Lateral OFC activity (feedback stage) . . . . .	91
Female participants . . . . .	91
Male participants . . . . .	92
4.10 Model: CBCL internalizing factor ~ PDS x Medial OFC activity (feedback stage) . . . . .	92
Female participants . . . . .	92
Male participants . . . . .	93
4.11 Model: CBCL internalizing factor ~ PDS x BIS-BAS . . . . .	94
Female participants . . . . .	94
Male participants . . . . .	95
4.12 Model: CBCL internalizing factor ~ PDS x MID reaction time (large reward vs. neutral) . . . .	96
Female participants . . . . .	96
Male participants . . . . .	96
4.13 Model: CBCL internalizing factor ~ PDS x MID reaction time (large vs. small reward) . . . .	97
Female participants . . . . .	97
Male participants . . . . .	98
4.14 Model: CBCL internalizing factor ~ Testosterone x Accumbens activity (anticipation stage) + PDS . . . . .	99
Female participants . . . . .	99
Male participants . . . . .	100
4.15 Model: CBCL internalizing factor ~ Testosterone x Caudate activity (anticipation stage) + PDS	101
Female participants . . . . .	101
Male participants . . . . .	102
4.16 Model: CBCL internalizing factor ~ Testosterone x Putamen activity (anticipation stage) + PDS . . . . .	103
Female participants . . . . .	103
Male participants . . . . .	104
4.17 Model: CBCL internalizing factor ~ Testosterone x Accumbens activity (feedback stage) + PDS	105
Female participants . . . . .	105

Male participants . . . . .	106
4.18 Model: CBCL internalizing factor ~ Testosterone x Caudate activity (Feedback stage) + PDS	108
Female participants . . . . .	108
Male participants . . . . .	109
4.19 Model: CBCL internalizing factor ~ Testosterone x Putamen activity (Feedback stage) + PDS	110
Female participants . . . . .	110
Male participants . . . . .	111
4.20 Model: CBCL internalizing factor ~ Testosterone x Lateral OFC activity (anticipation stage) + PDS . . . . .	112
Female participants . . . . .	112
Male participants . . . . .	113
4.21 Model: CBCL internalizing factor ~ Testosterone x Medial OFC activity (anticipation stage) + PDS . . . . .	114
Female participants . . . . .	114
Male participants . . . . .	114
4.22 Model: CBCL internalizing factor ~ Testosterone x Lateral OFC activity (feedback stage) + PDS . . . . .	115
Female participants . . . . .	115
Male participants . . . . .	116
4.23 Model: CBCL internalizing factor ~ Testosterone x Medial OFC activity (feedback stage) + PDS . . . . .	117
Female participants . . . . .	117
Male participants . . . . .	119
4.24 Model: CBCL internalizing factor ~ Testosterone x BIS-BAS RR + PDS . . . . .	120
Female participants . . . . .	120
Male participants . . . . .	121
4.25 Model: CBCL internalizing factor ~ Testosterone x MID Reaction Time + PDS (large reward vs. neutral) . . . . .	122
Female participants . . . . .	122
Male participants . . . . .	123
4.26 Model: CBCL internalizing factor ~ Testosterone x MID Reaction Time + PDS (large vs. small reward) . . . . .	124
Female participants . . . . .	124
Male participants . . . . .	125
<b>5— Correlation Matrix —</b>	<b>128</b>
Female participants . . . . .	128
Male participants . . . . .	129

<b>6— Compare Outliers to Non-Outliers on Demographic Variables —</b>	<b>130</b>
Female participants . . . . .	130
Male participants . . . . .	130

## Results for Sample 1



# 1—Internalizing~Puberty—

## 1.1 Model: CBCL internalizing factor ~ PDS

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.079678274 0.02096269
## Xrace.ethnicity.5levelBlack 0.008788022 0.05156209
## Xrace.ethnicity.5levelMixed 0.111225638 0.04779910
## Xrace.ethnicity.5levelOther 0.093887511 0.03468556
## Xrace.ethnicity.5levelWhite 0.116925862 0.06403075
## Xinterview_age  -0.007909539 0.01978176
## Xdemo_race_hispanic1 0.015489194 0.02266145
```

### Male participants

```
##
## 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)                2.255e+00  1.777e+00  1.269  0.20458
## PDS_score                   8.334e-01  1.980e-01  4.209  2.64e-05 ***
## race.ethnicity.5levelBlack  1.377e+00  7.416e-01  1.856  0.06353 .
## race.ethnicity.5levelMixed  2.093e+00  7.431e-01  2.817  0.00488 **
## race.ethnicity.5levelOther  1.947e+00  8.509e-01  2.288  0.02222 *
## race.ethnicity.5levelWhite  1.540e+00  6.956e-01  2.214  0.02693 *
## interview_age              -3.293e-05  1.394e-02  -0.002  0.99812
## demo_race_hispanic1        2.449e-01  3.000e-01  0.816  0.41442
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00708
## lmer.REML = 17774 Scale est. = 15.934    n = 2858

##                                stdcoef      stdse
## X(Intercept)                  0.000000e+00 0.00000000
## XPDS_score                    8.295425e-02 0.01970691
## Xrace.ethnicity.5levelBlack   8.862927e-02 0.04774848
## Xrace.ethnicity.5levelMixed   1.244175e-01 0.04416352
## Xrace.ethnicity.5levelOther   7.603352e-02 0.03323393
## Xrace.ethnicity.5levelWhite   1.327504e-01 0.05996650
## Xinterview_age                -4.489059e-05 0.01900751
## Xdemo_race_hispanic1         1.769753e-02 0.02168112
```

## 1.2 Model: CBCL Anxious-Depressed ~ PDS

### Female participants

```
##
## 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
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.00000000
## XPDS_score                    0.045939845 0.02109848
## Xrace.ethnicity.5levelBlack  0.004021024 0.05157799
## Xrace.ethnicity.5levelMixed  0.097548974 0.04784057
## Xrace.ethnicity.5levelOther  0.066162685 0.03475717
## Xrace.ethnicity.5levelWhite  0.123389443 0.06406881
## Xinterview_age                -0.005121910 0.01998372
## Xdemo_race_hispanic1         0.003084070 0.02261604
```

## Male participants

```
##
## 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)    1.302113   0.993063   1.311  0.18989
## PDS_score       0.415556   0.110380   3.765  0.00017 ***
## race.ethnicity.5levelBlack  0.621219   0.413296   1.503  0.13293
## race.ethnicity.5levelMixed  1.145379   0.414380   2.764  0.00575 **
## race.ethnicity.5levelOther  1.102501   0.473565   2.328  0.01998 *
## race.ethnicity.5levelWhite  1.048614   0.387997   2.703  0.00692 **
## interview_age    -0.003189   0.007794  -0.409  0.68243
## demo_race_hispanic1    0.097466   0.166064   0.587  0.55731
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00662
## lmer.REML = 14459 Scale est. = 6.6656    n = 2858
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.00000000
## XPDS_score                    0.07436588 0.01975302
## Xrace.ethnicity.5levelBlack  0.07190757 0.04783996
## Xrace.ethnicity.5levelMixed  0.12238938 0.04427851
## Xrace.ethnicity.5levelOther  0.07741939 0.03325447
## Xrace.ethnicity.5levelWhite  0.16252548 0.06013600
## Xinterview_age                -0.00781615 0.01910142
## Xdemo_race_hispanic1         0.01266408 0.02157727
```

## 1.3 Model: CBCL Withdrawn-Depressed ~ PDS

### Female participants

```
##
```

```

## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.000000000
## XPDS_score      0.088652509 0.02114652
## Xrace.ethnicity.5levelBlack 0.041784681 0.05136371
## Xrace.ethnicity.5levelMixed 0.084051987 0.04768728
## Xrace.ethnicity.5levelOther 0.075815285 0.03469358
## Xrace.ethnicity.5levelWhite 0.065141430 0.06383239
## Xinterview_age  -0.009811582 0.02009505
## Xdemo_race_hispanic1 0.043523846 0.02242636

```

## Male participants

```

##
## 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)    0.4354800   0.5588798   0.779   0.43593
## PDS_score      0.1837485   0.0624541   2.942   0.00329 **
## race.ethnicity.5levelBlack 0.5741763   0.2317685   2.477   0.01329 *
## race.ethnicity.5levelMixed 0.6116549   0.2335881   2.619   0.00888 **
## race.ethnicity.5levelOther 0.4626746   0.2672891   1.731   0.08356 .
## race.ethnicity.5levelWhite 0.3807318   0.2176624   1.749   0.08037 .
## interview_age  -0.0003348   0.0043983  -0.076   0.93932

```

```
## demo_race_hispanic1      0.0301344  0.0889321   0.339  0.73475
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00631
## lmer.REML = 11226  Scale est. = 2.0767    n = 2858

##                stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## XPDS_score        0.058036162 0.01972584
## Xrace.ethnicity.5levelBlack 0.117302035 0.04734942
## Xrace.ethnicity.5levelMixed 0.115353697 0.04405303
## Xrace.ethnicity.5levelOther 0.057342539 0.03312702
## Xrace.ethnicity.5levelWhite 0.104149075 0.05954149
## Xinterview_age     -0.001448337 0.01902550
## Xdemo_race_hispanic1 0.006910594 0.02039441
```

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

### Female participants

```
##
## 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

##                stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## XPDS_score        0.075266482 0.02105703
## Xrace.ethnicity.5levelBlack 0.042391288 0.05117131
## Xrace.ethnicity.5levelMixed 0.121006828 0.04758623
## Xrace.ethnicity.5levelOther 0.095094061 0.03463058
```

```
## Xrace.ethnicity.5levelWhite 0.132281618 0.06359093
## Xinterview_age -0.007176567 0.01991746
## Xdemo_race_hispanic1 0.022757644 0.02218454
```

## Male participants

```
##
## 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)    0.4836320  0.6822550   0.709  0.47846
## PDS_score      0.2271161  0.0760293   2.987  0.00284 **
## race.ethnicity.5levelBlack 0.4981842  0.2837086   1.756  0.07920 .
## race.ethnicity.5levelMixed 0.6660665  0.2849471   2.338  0.01948 *
## race.ethnicity.5levelOther 0.5834181  0.3259348   1.790  0.07356 .
## race.ethnicity.5levelWhite 0.5019968  0.2663551   1.885  0.05957 .
## interview_age  0.0006022  0.0053611   0.112  0.91057
## demo_race_hispanic1 -0.0459753  0.1125485  -0.408  0.68294
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00281
## lmer.REML = 12332 Scale est. = 2.9434 n = 2858

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.059115152 0.01978936
## Xrace.ethnicity.5levelBlack 0.083873797 0.04776491
## Xrace.ethnicity.5levelMixed 0.103518696 0.04428590
## Xrace.ethnicity.5levelOther 0.059587779 0.03328956
## Xrace.ethnicity.5levelWhite 0.113165305 0.06004451
## Xinterview_age  0.002146830 0.01911106
## Xdemo_race_hispanic1 -0.008688675 0.02127005
```

## 1.5 Model: CBCL internalizing factor ~ Pubertal category

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xpds_p_ss_categoryEarly 0.08060431 0.02227793
## Xpds_p_ss_categoryLate  0.04811159 0.02014948
## Xpds_p_ss_categoryMid   0.10804785 0.02450813
## Xrace.ethnicity.5levelBlack 0.01255255 0.05153739
## Xrace.ethnicity.5levelMixed 0.11533323 0.04775786
## Xrace.ethnicity.5levelOther 0.09607645 0.03462406
## Xrace.ethnicity.5levelWhite 0.12275348 0.06397543
## Xinterview_age      -0.01569732 0.02007197
## Xdemo_race_hispanic1  0.01065867 0.02272329
```

## Male participants

```
##
## 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)      2.767043    1.792556   1.544 0.12279
## pds_p_ss_categoryEarly 0.686426    0.246874   2.780 0.00546 **
## pds_p_ss_categoryLate  0.398198    1.460564   0.273 0.78516
## pds_p_ss_categoryMid   1.178711    0.495224   2.380 0.01737 *
## race.ethnicity.5levelBlack 1.455499    0.742891   1.959 0.05018 .
## race.ethnicity.5levelMixed 2.136914    0.743993   2.872 0.00411 **
## race.ethnicity.5levelOther 1.988641    0.852250   2.333 0.01970 *
## race.ethnicity.5levelWhite 1.577340    0.696497   2.265 0.02361 *
## interview_age      0.002858    0.013934   0.205 0.83751
```

```
## demo_race_hispanic1      0.226558  0.301163  0.752  0.45195
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00485
## lmer.REML = 17777  Scale est. = 16.206    n = 2858

##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.000000000
## Xpds_p_ss_categoryEarly       0.054041223 0.01943597
## Xpds_p_ss_categoryLate       0.005065386 0.01857952
## Xpds_p_ss_categoryMid        0.046510015 0.01954072
## Xrace.ethnicity.5levelBlack  0.093708659 0.04782920
## Xrace.ethnicity.5levelMixed  0.127004697 0.04421824
## Xrace.ethnicity.5levelOther  0.077672135 0.03328710
## Xrace.ethnicity.5levelWhite  0.135978159 0.06004314
## Xinterview_age                0.003896045 0.01899556
## Xdemo_race_hispanic1        0.016373450 0.02176517
```

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

### Female participants

```
##
## 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

##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.000000000
```



```
## Xpds_p_ss_categoryEarly      0.0666821146 0.02252895
## Xpds_p_ss_categoryLate      0.0208294600 0.02038447
## Xpds_p_ss_categoryMid       0.0647849179 0.02467878
## Xrace.ethnicity.5levelBlack 0.0098365511 0.05157488
## Xrace.ethnicity.5levelMixed 0.1016743896 0.04781824
## Xrace.ethnicity.5levelOther 0.0682706259 0.03470949
## Xrace.ethnicity.5levelWhite 0.1282513981 0.06403985
## Xinterview_age              -0.0088550958 0.02029912
## Xdemo_race_hispanic1        0.0008370453 0.02269039
```

## Male participants

```
##
## 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)    1.587321   1.001121   1.586  0.11295
## pds_p_ss_categoryEarly 0.436097   0.137806   3.165  0.00157 **
## pds_p_ss_categoryLate 0.345434   0.817588   0.423  0.67269
## pds_p_ss_categoryMid 0.434931   0.275375   1.579  0.11435
## race.ethnicity.5levelBlack 0.660347   0.413811   1.596  0.11065
## race.ethnicity.5levelMixed 1.172055   0.414675   2.826  0.00474 **
## race.ethnicity.5levelOther 1.135594   0.474086   2.395  0.01667 *
## race.ethnicity.5levelWhite 1.069610   0.388310   2.755  0.00592 **
## interview_age    -0.002156   0.007782  -0.277  0.78175
## demo_race_hispanic1 0.087105   0.166704   0.523  0.60135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00511
## lmer.REML = 14461 Scale est. = 6.7455 n = 2858

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xpds_p_ss_categoryEarly 0.061727178 0.01950572
## Xpds_p_ss_categoryLate 0.007900235 0.01869865
## Xpds_p_ss_categoryMid 0.030854737 0.01953551
## Xrace.ethnicity.5levelBlack 0.076436704 0.04789953
## Xrace.ethnicity.5levelMixed 0.125239875 0.04431002
## Xrace.ethnicity.5levelOther 0.079743217 0.03329108
## Xrace.ethnicity.5levelWhite 0.165779539 0.06018439
## Xinterview_age   -0.005284360 0.01907259
## Xdemo_race_hispanic1 0.011317928 0.02166042
```

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

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xpds_p_ss_categoryEarly 0.06785245 0.02264112
## Xpds_p_ss_categoryLate  0.08826088 0.02049517
## Xpds_p_ss_categoryMid   0.11568793 0.02469164
## Xrace.ethnicity.5levelBlack 0.04056024 0.05123969
## Xrace.ethnicity.5levelMixed 0.08677235 0.04756868
## Xrace.ethnicity.5levelOther 0.07564646 0.03458409
## Xrace.ethnicity.5levelWhite 0.07053444 0.06365511
## Xinterview_age      -0.02351395 0.02038300
## Xdemo_race_hispanic1  0.03481499 0.02241516
```

### Male participants

```
##
## 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)      0.5566494  0.5632536   0.988  0.32310
## pds_p_ss_categoryEarly 0.1324914  0.0780648   1.697  0.08977 .
## pds_p_ss_categoryLate  0.0215316  0.4639320   0.046  0.96299
## pds_p_ss_categoryMid   0.3986271  0.1561815   2.552  0.01075 *
## race.ethnicity.5levelBlack 0.5801070  0.2319830   2.501  0.01245 *
## race.ethnicity.5levelMixed 0.6175353  0.2336669   2.643  0.00827 **
## race.ethnicity.5levelOther 0.4616035  0.2675074   1.726  0.08453 .
## race.ethnicity.5levelWhite 0.3878885  0.2177655   1.781  0.07498 .
## interview_age         0.0002516  0.0043894   0.057  0.95430
## demo_race_hispanic1    0.0228043  0.0893258   0.255  0.79852
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00564
## lmer.REML = 11228  Scale est. = 2.0873    n = 2858

##               stdcoef      stdse
## X(Intercept)      0.0000000000 0.00000000
## Xpds_p_ss_categoryEarly 0.0330987207 0.01950198
## Xpds_p_ss_categoryLate  0.0008691262 0.01872666
## Xpds_p_ss_categoryMid   0.0499112512 0.01955516
## Xrace.ethnicity.5levelBlack 0.1185136478 0.04739325
## Xrace.ethnicity.5levelMixed 0.1164627104 0.04406790
## Xrace.ethnicity.5levelOther 0.0572097864 0.03315408
## Xrace.ethnicity.5levelWhite 0.1061067786 0.05956967
## Xinterview_age       0.0010882377 0.01898707
## Xdemo_race_hispanic1  0.0052296043 0.02048469
```

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

### Female participants

```
##
## 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

## stdcoef stdse
## X(Intercept) 0.00000000 0.00000000
## Xpds_p_ss_categoryEarly 0.05824499 0.02248746
## Xpds_p_ss_categoryLate 0.06086848 0.02033099
## Xpds_p_ss_categoryMid 0.10029741 0.02462256
## Xrace.ethnicity.5levelBlack 0.04150767 0.05115809
## Xrace.ethnicity.5levelMixed 0.12289703 0.04755027
## Xrace.ethnicity.5levelOther 0.09548869 0.03457437
## Xrace.ethnicity.5levelWhite 0.13622777 0.06354166
## Xinterview_age -0.01679345 0.02021751
## Xdemo_race_hispanic1 0.01689074 0.02225046
```

## Male participants

```
##
## 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) 0.665155 0.687317 0.968 0.3332
## pds_p_ss_categoryEarly 0.221676 0.094869 2.337 0.0195 *
## pds_p_ss_categoryLate -0.071837 0.562670 -0.128 0.8984
## pds_p_ss_categoryMid 0.475409 0.189798 2.505 0.0123 *
## race.ethnicity.5levelBlack 0.499155 0.283856 1.758 0.0788 .
## race.ethnicity.5levelMixed 0.673906 0.284949 2.365 0.0181 *
## race.ethnicity.5levelOther 0.585366 0.326095 1.795 0.0727 .
## race.ethnicity.5levelWhite 0.512173 0.266369 1.923 0.0546 .
## interview_age 0.000953 0.005349 0.178 0.8586
## demo_race_hispanic1 -0.057445 0.112899 -0.509 0.6109
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00264
## lmer.REML = 12332 Scale est. = 2.9439 n = 2858

## stdcoef stdse
## X(Intercept) 0.000000000 0.000000000
## Xpds_p_ss_categoryEarly 0.045637063 0.01953107
```

```
## Xpds_p_ss_categoryLate      -0.002389617 0.01871698
## Xpds_p_ss_categoryMid       0.049054089 0.01958388
## Xrace.ethnicity.5levelBlack  0.084037199 0.04778974
## Xrace.ethnicity.5levelMixed  0.104737062 0.04428625
## Xrace.ethnicity.5levelOther  0.059786741 0.03330588
## Xrace.ethnicity.5levelWhite  0.115459379 0.06004757
## Xinterview_age              0.003397214 0.01906877
## Xdemo_race_hispanic1        -0.010856270 0.02133635
```

## 1.9 Model: CBCL internalizing factor ~ Testosterone

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.000000000
## Xhormone_scr_ert_mean 0.016033862 0.02079048
## Xrace.ethnicity.5levelBlack 0.022625361 0.05043105
## Xrace.ethnicity.5levelMixed 0.111704497 0.04853712
## Xrace.ethnicity.5levelOther 0.103316708 0.03554169
## Xrace.ethnicity.5levelWhite 0.124259018 0.06422335
## Xinterview_age    0.018455837 0.02034908
## Xdemo_race_hispanic1 0.007687489 0.02342355
```

### Male participants

```
##
## 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)      2.168027   1.863328   1.164  0.24472
## hormone_scr_ert_mean 0.002647   0.007279   0.364  0.71610
## race.ethnicity.5levelBlack 1.728885   0.771409   2.241  0.02510 *
## race.ethnicity.5levelMixed 2.136533   0.773964   2.761  0.00581 **
## race.ethnicity.5levelOther 1.852029   0.891676   2.077  0.03790 *
## race.ethnicity.5levelWhite 1.577412   0.724219   2.178  0.02949 *
## interview_age      0.009005   0.014668   0.614  0.53933
## demo_race_hispanic1 0.380427   0.312291   1.218  0.22326
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00091
## lmer.REML = 16592 Scale est. = 16.744    n = 2652

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## Xhormone_scr_ert_mean 0.007382955 0.02029885
## Xrace.ethnicity.5levelBlack 0.109172846 0.04871167
## Xrace.ethnicity.5levelMixed 0.126161577 0.04570235
## Xrace.ethnicity.5levelOther 0.070852250 0.03411246
## Xrace.ethnicity.5levelWhite 0.134173075 0.06160131
## Xinterview_age      0.012156013 0.01980087
## Xdemo_race_hispanic1 0.027182278 0.02231384
```

## 1.10 Model: CBCL Anxious-Depressed ~ Testosterone

### Female participants

```
##
## 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

##                stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.025295012 0.02091515
## Xrace.ethnicity.5levelBlack 0.003875357 0.05035431
## Xrace.ethnicity.5levelMixed 0.093358200 0.04848619
## Xrace.ethnicity.5levelOther 0.071989735 0.03554307
## Xrace.ethnicity.5levelWhite 0.130560331 0.06415092
## Xinterview_age      0.008703330 0.02051598
## Xdemo_race_hispanic1 -0.003537101 0.02336061
```

## Male participants

```
##
## 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)      1.4024752  1.0403825   1.348  0.17776
## hormone_scr_ert_mean -0.0002916  0.0040592  -0.072  0.94273
## race.ethnicity.5levelBlack 0.8142553  0.4296856   1.895  0.05820 .
## race.ethnicity.5levelMixed 1.1555356  0.4315081   2.678  0.00745 **
## race.ethnicity.5levelOther 1.0604342  0.4960589   2.138  0.03263 *
## race.ethnicity.5levelWhite 1.0359287  0.4038541   2.565  0.01037 *
## interview_age      0.0007301  0.0081858   0.089  0.92893
## demo_race_hispanic1  0.1601077  0.1727342   0.927  0.35406
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00142
## lmer.REML = 13515  Scale est. = 7.1596    n = 2652

##                stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.025295012 0.02091515
## Xrace.ethnicity.5levelBlack 0.003875357 0.05035431
## Xrace.ethnicity.5levelMixed 0.093358200 0.04848619
## Xrace.ethnicity.5levelOther 0.071989735 0.03554307
## Xrace.ethnicity.5levelWhite 0.130560331 0.06415092
```

```
## Xinterview_age          0.008703330 0.02051598
## Xdemo_race_hispanic1   -0.003537101 0.02336061
```

## 1.11 Model: CBCL Withdrawn-Depressed ~ Testosterone

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## Xhormone_scr_ert_mean 0.01394301 0.02108262
## Xrace.ethnicity.5levelBlack 0.06147413 0.05026165
## Xrace.ethnicity.5levelMixed 0.09255437 0.04846269
## Xrace.ethnicity.5levelOther 0.08144294 0.03558991
## Xrace.ethnicity.5levelWhite 0.07655856 0.06408774
## Xinterview_age    0.01661007 0.02073628
## Xdemo_race_hispanic1 0.03609479 0.02321844
```

### Male participants

```
##
## 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)      0.331248   0.577533   0.574  0.56632
## hormone_scr_ert_mean 0.001538   0.002241   0.687  0.49242
## race.ethnicity.5levelBlack 0.679218   0.237426   2.861  0.00426 **
## race.ethnicity.5levelMixed 0.653437   0.239841   2.724  0.00648 **
## race.ethnicity.5levelOther 0.449377   0.276047   1.628  0.10366
## race.ethnicity.5levelWhite 0.415258   0.223362   1.859  0.06312 .
## interview_age      0.001877   0.004557   0.412  0.68038
## demo_race_hispanic1 0.062563   0.091277   0.685  0.49314
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00368
## lmer.REML = 10444 Scale est. = 2.2519    n = 2652

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## Xhormone_scr_ert_mean 0.013785987 0.020080000
## Xrace.ethnicity.5levelBlack 0.137824656 0.04817762
## Xrace.ethnicity.5levelMixed 0.123991081 0.04551025
## Xrace.ethnicity.5levelOther 0.055244113 0.03393572
## Xrace.ethnicity.5levelWhite 0.113503077 0.06105175
## Xinterview_age      0.008144147 0.01976814
## Xdemo_race_hispanic1 0.014364780 0.02095773
```

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

### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + 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
```

```
##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean 0.01354995 0.02086202
## Xrace.ethnicity.5levelBlack 0.05432347 0.04987408
## Xrace.ethnicity.5levelMixed 0.12446769 0.04820919
## Xrace.ethnicity.5levelOther 0.10234885 0.03543918
## Xrace.ethnicity.5levelWhite 0.14058123 0.06360714
## Xinterview_age      0.01569345 0.02048120
## Xdemo_race_hispanic1 0.01406111 0.02283175
```

## Male participants

```
##
## 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)      0.4492781  0.7138023   0.629   0.5291
## hormone_scr_ert_mean 0.0006326  0.0027819   0.227   0.8201
## race.ethnicity.5levelBlack 0.5974881  0.2944216   2.029   0.0425 *
## race.ethnicity.5levelMixed 0.7062815  0.2963015   2.384   0.0172 *
## race.ethnicity.5levelOther 0.5316090  0.3411263   1.558   0.1193
## race.ethnicity.5levelWhite 0.5137144  0.2767329   1.856   0.0635 .
## interview_age      0.0032500  0.0056258   0.578   0.5635
## demo_race_hispanic1 -0.0160044  0.1167685  -0.137   0.8910
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000243
## lmer.REML = 11535 Scale est. = 2.9569 n = 2652
```

```
##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## Xhormone_scr_ert_mean 0.004609412 0.02027014
## Xrace.ethnicity.5levelBlack 0.098575746 0.04857473
## Xrace.ethnicity.5levelMixed 0.108965168 0.04571342
## Xrace.ethnicity.5levelOther 0.053136195 0.03409678
## Xrace.ethnicity.5levelWhite 0.114165318 0.06149973
## Xinterview_age      0.011462798 0.01984231
## Xdemo_race_hispanic1 -0.002987764 0.02179879
```

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

#### Female participants

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

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.002157532 0.02135282
## XPDS_score          0.079996978 0.02232246
## Xrace.ethnicity.5levelBlack -0.002385464 0.05078772
## Xrace.ethnicity.5levelMixed  0.100535650 0.04851729
## Xrace.ethnicity.5levelOther  0.094102604 0.03554753
## Xrace.ethnicity.5levelWhite  0.116311148 0.06410109
## Xinterview_age       0.002518249 0.02078038
## Xdemo_race_hispanic1    0.006732210 0.02336409
```

#### Male participants

```
##
## 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)                2.3451907  1.8572537   1.263  0.20680
## hormone_scr_ert_mean      -0.0008829  0.0072966  -0.121  0.90370
## PDS_score                  0.9487371  0.2115320   4.485  7.6e-06 ***
## race.ethnicity.5levelBlack 1.3599716  0.7732091   1.759  0.07872 .
## race.ethnicity.5levelMixed 2.0453733  0.7715514   2.651  0.00807 **
## race.ethnicity.5levelOther 1.7245525  0.8890914   1.940  0.05252 .
## race.ethnicity.5levelWhite 1.5405067  0.7218054   2.134  0.03291 *
## interview_age              -0.0014188  0.0148020  -0.096  0.92365
## demo_race_hispanic1        0.3030948  0.3119631   0.972  0.33135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00748
## lmer.REML = 16573  Scale est. = 16.48    n = 2652

##                                stdcoef      stdse
## X(Intercept)                  0.000000000  0.000000000
## Xhormone_scr_ert_mean          -0.002462288  0.02034893
## XPDS_score                     0.092461287  0.02061532
## Xrace.ethnicity.5levelBlack    0.085877291  0.04882536
## Xrace.ethnicity.5levelMixed    0.120778635  0.04555986
## Xrace.ethnicity.5levelOther    0.065975436  0.03401357
## Xrace.ethnicity.5levelWhite    0.131033922  0.06139603
## Xinterview_age                 -0.001915276  0.01998195
## Xdemo_race_hispanic1          0.021656733  0.02229039
```

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

### Female participants

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

	stdcoef	stdse
## X(Intercept)	0.0000000000	0.00000000
## Xhormone_scr_ert_mean	0.0011818672	0.02114545
## Xpds_p_ss_categoryEarly	0.0720675070	0.02320251
## Xpds_p_ss_categoryLate	0.0296449313	0.02087833
## Xpds_p_ss_categoryMid	0.1091599094	0.02581217
## Xrace.ethnicity.5levelBlack	0.0003575324	0.05078812
## Xrace.ethnicity.5levelMixed	0.1035315893	0.04849344
## Xrace.ethnicity.5levelOther	0.0968551970	0.03549674
## Xrace.ethnicity.5levelWhite	0.1209675645	0.06406555
## Xinterview_age	-0.0034045374	0.02105865
## Xdemo_race_hispanic1	0.0034281562	0.02343789

## Male participants

```
##
## 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)    2.9749057   1.8733829   1.588  0.11241
## hormone_scr_ert_mean 0.0006428   0.0072887   0.088  0.92973
## pds_p_ss_categoryEarly 0.8149789   0.2601042   3.133  0.00175 **
## pds_p_ss_categoryLate 0.8421277   1.5964505   0.528  0.59789
## pds_p_ss_categoryMid 1.2759293   0.5248178   2.431  0.01512 *
## race.ethnicity.5levelBlack 1.4311786   0.7750105   1.847  0.06491 .
## race.ethnicity.5levelMixed 2.0908969   0.7728241   2.706  0.00686 **
## race.ethnicity.5levelOther 1.7855890   0.8908639   2.004  0.04514 *
## race.ethnicity.5levelWhite 1.5842816   0.7229125   2.192  0.02850 *
## interview_age    0.0010580   0.0148078   0.071  0.94305
## demo_race_hispanic1 0.2736542   0.3133001   0.873  0.38249
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00488
## lmer.REML = 16576  Scale est. = 16.783    n = 2652
```

	stdcoef	stdse
## X(Intercept)	0.0000000000	0.00000000
## Xhormone_scr_ert_mean	0.001792595	0.02032693
## Xpds_p_ss_categoryEarly	0.063335416	0.02021378

```
## Xpds_p_ss_categoryLate      0.010164229 0.01926868
## Xpds_p_ss_categoryMid       0.049542135 0.02037777
## Xrace.ethnicity.5levelBlack 0.090373759 0.04893911
## Xrace.ethnicity.5levelMixed 0.123466791 0.04563501
## Xrace.ethnicity.5levelOther 0.068310481 0.03408138
## Xrace.ethnicity.5levelWhite 0.134757373 0.06149020
## Xinterview_age              0.001428227 0.01998972
## Xdemo_race_hispanic1        0.019553147 0.02238593
```

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

### Female participants

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

##               stdcoef      stdse
## X(Intercept)    0.0000000000 0.00000000
## Xhormone_scr_ert_mean 0.0157934393 0.02153673
## XPDS_score      0.0412057495 0.02247032
## Xrace.ethnicity.5levelBlack -0.0090699635 0.05081812
## Xrace.ethnicity.5levelMixed  0.0875690910 0.04856120
## Xrace.ethnicity.5levelOther  0.0671834638 0.03561965
## Xrace.ethnicity.5levelWhite  0.1264048082 0.06415309
## Xinterview_age    0.0005188738 0.02098374
## Xdemo_race_hispanic1 -0.0040218594 0.02334697
```

### Male participants

```
##
```

```

## 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)      1.497129   1.037898   1.442   0.1493
## hormone_scr_ert_mean -0.002080   0.004073  -0.511   0.6095
## PDS_score         0.479249   0.117988   4.062 5.01e-05 ***
## race.ethnicity.5levelBlack 0.626727   0.431078   1.454   0.1461
## race.ethnicity.5levelMixed 1.107872   0.430497   2.573   0.0101 *
## race.ethnicity.5levelOther 0.996589   0.494971   2.013   0.0442 *
## race.ethnicity.5levelWhite 1.015814   0.402838   2.522   0.0117 *
## interview_age     -0.004572   0.008268  -0.553   0.5803
## demo_race_hispanic1 0.121678   0.172790   0.704   0.4814
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00668
## lmer.REML = 13501 Scale est. = 7.0696    n = 2652

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.01042667 0.02041314
## XPDS_score         0.08393690 0.02066466
## Xrace.ethnicity.5levelBlack 0.07112205 0.04891942
## Xrace.ethnicity.5levelMixed 0.11756669 0.04568408
## Xrace.ethnicity.5levelOther 0.06851717 0.03403004
## Xrace.ethnicity.5levelWhite 0.15527869 0.06157837
## Xinterview_age     -0.01109268 0.02005929
## Xdemo_race_hispanic1 0.01562436 0.02218760

```

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

### Female participants

```

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

```
##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.000000000
## Xhormone_scr_ert_mean          0.018994922 0.02133217
## Xpds_p_ss_categoryEarly        0.062784333 0.02342944
## Xpds_p_ss_categoryLate         0.004743106 0.02113600
## Xpds_p_ss_categoryMid          0.063409386 0.02597197
## Xrace.ethnicity.5levelBlack    -0.004457115 0.05082334
## Xrace.ethnicity.5levelMixed     0.090663707 0.04854067
## Xrace.ethnicity.5levelOther     0.069596400 0.03557028
## Xrace.ethnicity.5levelWhite     0.130279855 0.06412419
## Xinterview_age                 -0.002518605 0.02127777
## Xdemo_race_hispanic1          -0.005134106 0.02342844
```

## Male participants

```
##
## 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)                  1.825949   1.046289   1.745 0.081072 .
## hormone_scr_ert_mean         -0.001268   0.004067  -0.312 0.755199
## pds_p_ss_categoryEarly        0.481718   0.145292   3.316 0.000927 ***
## pds_p_ss_categoryLate         0.592866   0.895264   0.662 0.507885
## pds_p_ss_categoryMid          0.488618   0.291851   1.674 0.094209 .
## race.ethnicity.5levelBlack    0.670789   0.431935   1.553 0.120547
## race.ethnicity.5levelMixed    1.139258   0.431021   2.643 0.008262 **
## race.ethnicity.5levelOther    1.042163   0.495761   2.102 0.035635 *
## race.ethnicity.5levelWhite    1.043333   0.403309   2.587 0.009736 **
## interview_age                 -0.003563   0.008265  -0.431 0.666403
## demo_race_hispanic1           0.106431   0.173561   0.613 0.539781
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```



```
##
##
## R-sq.(adj) = 0.00466
## lmer.REML = 13503 Scale est. = 7.1605 n = 2652

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.006355775 0.02038255
## Xpds_p_ss_categoryEarly 0.067277648 0.02029174
## Xpds_p_ss_categoryLate 0.012859676 0.01941892
## Xpds_p_ss_categoryMid 0.034095326 0.02036512
## Xrace.ethnicity.5levelBlack 0.076122288 0.04901677
## Xrace.ethnicity.5levelMixed 0.120897416 0.04573972
## Xrace.ethnicity.5levelOther 0.071650404 0.03408441
## Xrace.ethnicity.5levelWhite 0.159485135 0.06165033
## Xinterview_age -0.008644950 0.02005147
## Xdemo_race_hispanic1 0.013666637 0.02228655
```

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

### Female participants

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

##               stdcoef      stdse
## X(Intercept)      0.0000000e+00 0.00000000
## Xhormone_scr_ert_mean -5.922691e-03 0.02167236
## XPDS_score          8.424189e-02 0.02257935
## Xrace.ethnicity.5levelBlack 3.523631e-02 0.05060126
```

```
## Xrace.ethnicity.5levelMixed 8.093960e-02 0.04842092
## Xrace.ethnicity.5levelOther 7.165441e-02 0.03559062
## Xrace.ethnicity.5levelWhite 6.832264e-02 0.06391230
## Xinterview_age -7.702846e-05 0.02114834
## Xdemo_race_hispanic1 3.473852e-02 0.02310743
```

## Male participants

```
##
## 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)    0.3813731   0.5765246   0.662 0.508347
## hormone_scr_ert_mean 0.0006791   0.0022506   0.302 0.762869
## PDS_score      0.2179998   0.0659193   3.307 0.000955 ***
## race.ethnicity.5levelBlack 0.5884738   0.2385225   2.467 0.013682 *
## race.ethnicity.5levelMixed 0.6306338   0.2394544   2.634 0.008497 **
## race.ethnicity.5levelOther 0.4223634   0.2756136   1.532 0.125532
## race.ethnicity.5levelWhite 0.4071157   0.2228930   1.827 0.067887 .
## interview_age  -0.0005648   0.0046067  -0.123 0.902435
## demo_race_hispanic1 0.0415761   0.0911750   0.456 0.648425
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00738
## lmer.REML = 10437 Scale est. = 2.241 n = 2652

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.006086061 0.02016943
## XPDS_score      0.068271449 0.02064408
## Xrace.ethnicity.5levelBlack 0.119411099 0.04840018
## Xrace.ethnicity.5levelMixed 0.119664092 0.04543697
## Xrace.ethnicity.5levelOther 0.051923159 0.03388250
## Xrace.ethnicity.5levelWhite 0.111277406 0.06092360
## Xinterview_age  -0.002449971 0.01998377
## Xdemo_race_hispanic1 0.009546123 0.02093434
```

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

### Female participants

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

```
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean + 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

##
```

	stdcoef	stdse
## X(Intercept)	0.000000000	0.000000000
## Xhormone_scr_ert_mean	-0.005591769	0.02145476
## Xpds_p_ss_categoryEarly	0.060730167	0.02362957
## Xpds_p_ss_categoryLate	0.064744089	0.02136966
## Xpds_p_ss_categoryMid	0.110319132	0.02606658
## Xrace.ethnicity.5levelBlack	0.034588750	0.05054392
## Xrace.ethnicity.5levelMixed	0.083337296	0.04835525
## Xrace.ethnicity.5levelOther	0.072405969	0.03551784
## Xrace.ethnicity.5levelWhite	0.072816912	0.06380542
## Xinterview_age	-0.010188454	0.02144014
## Xdemo_race_hispanic1	0.028298439	0.02313107

## Male participants

```
##
## 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)	5.246e-01	5.809e-01	0.903	0.36652
## hormone_scr_ert_mean	9.586e-04	2.245e-03	0.427	0.66947
## pds_p_ss_categoryEarly	1.529e-01	8.126e-02	1.881	0.06007 .

```
## pds_p_ss_categoryLate      5.583e-02  5.016e-01  0.111  0.91140
## pds_p_ss_categoryMid      4.621e-01  1.634e-01  2.828  0.00472 **
## race.ethnicity.5levelBlack 5.906e-01  2.389e-01  2.472  0.01348 *
## race.ethnicity.5levelMixed 6.337e-01  2.396e-01  2.645  0.00822 **
## race.ethnicity.5levelOther 4.214e-01  2.759e-01  1.527  0.12678
## race.ethnicity.5levelWhite 4.131e-01  2.230e-01  1.852  0.06411 .
## interview_age             9.875e-05  4.601e-03  0.021  0.98288
## demo_race_hispanic1       3.266e-02  9.160e-02  0.357  0.72147
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00644
## lmer.REML = 10439  Scale est. = 2.2584    n = 2652

##                                stdcoef      stdse
## X(Intercept)                   0.000000000 0.000000000
## Xhormone_scr_ert_mean           0.008590475 0.02012184
## Xpds_p_ss_categoryEarly         0.038174544 0.02029359
## Xpds_p_ss_categoryLate          0.002165214 0.01945589
## Xpds_p_ss_categoryMid           0.057659874 0.02038876
## Xrace.ethnicity.5levelBlack     0.119844034 0.04847202
## Xrace.ethnicity.5levelMixed     0.120247211 0.04546629
## Xrace.ethnicity.5levelOther     0.051808973 0.03391988
## Xrace.ethnicity.5levelWhite     0.112914322 0.06096314
## Xinterview_age                  0.000428364 0.01996110
## Xdemo_race_hispanic1           0.007498653 0.02103253
```

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

### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + 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

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.002775311 0.02145079
## XPDS_score         0.071157860 0.02243049
## Xrace.ethnicity.5levelBlack 0.031396751 0.05029959
## Xrace.ethnicity.5levelMixed 0.114221486 0.04822494
## Xrace.ethnicity.5levelOther 0.094088220 0.03546727
## Xrace.ethnicity.5levelWhite 0.133199563 0.06352658
## Xinterview_age      0.001608878 0.02092015
## Xdemo_race_hispanic1 0.013167622 0.02278749
```

### Male participants

```
##
## 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)      0.5022092  0.7127872   0.705 0.481139
## hormone_scr_ert_mean -0.0003917  0.0027948  -0.140 0.888539
## PDS_score         0.2692402  0.0812926   3.312 0.000939 ***
## race.ethnicity.5levelBlack 0.4894299  0.2957564   1.655 0.098075 .
## race.ethnicity.5levelMixed 0.6791623  0.2959022   2.295 0.021798 *
## race.ethnicity.5levelOther 0.4962040  0.3406952   1.456 0.145388
## race.ethnicity.5levelWhite 0.5028240  0.2763059   1.820 0.068901 .
## interview_age      0.0002839  0.0056878   0.050 0.960197
## demo_race_hispanic1 -0.0382889  0.1169102  -0.328 0.743311
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00332
## lmer.REML = 11527 Scale est. = 2.9467 n = 2652

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.002854321 0.02036382
## XPDS_score         0.068556120 0.02069938
## Xrace.ethnicity.5levelBlack 0.080747911 0.04879496
## Xrace.ethnicity.5levelMixed 0.104781214 0.04565181
## Xrace.ethnicity.5levelOther 0.049597343 0.03405369
## Xrace.ethnicity.5levelWhite 0.111745086 0.06140483
## Xinterview_age      0.001001269 0.02006110
## Xdemo_race_hispanic1 -0.007147910 0.02182525
```

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

### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean + 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.002332619 0.02124622
## Xpds_p_ss_categoryEarly  0.050712757 0.02342438
## Xpds_p_ss_categoryLate   0.038572117 0.02110263
## Xpds_p_ss_categoryMid    0.102059963 0.02592519
## Xrace.ethnicity.5levelBlack 0.028652756 0.05031503
## Xrace.ethnicity.5levelMixed 0.114517906 0.04820789
## Xrace.ethnicity.5levelOther 0.094691946 0.03542276
## Xrace.ethnicity.5levelWhite 0.135547491 0.06349994
## Xinterview_age        -0.006057651 0.02120532
## Xdemo_race_hispanic1    0.009159043 0.02286914
```

### Male participants

```
##
## 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)      7.141e-01  7.180e-01   0.995  0.32002
## hormone_scr_ert_mean -8.151e-05  2.788e-03  -0.029  0.97668
## pds_p_ss_categoryEarly  2.553e-01  1.000e-01   2.553  0.01073 *
## pds_p_ss_categoryLate   6.151e-02  6.153e-01   0.100  0.92038
## pds_p_ss_categoryMid    5.296e-01  2.013e-01   2.631  0.00857 **
## race.ethnicity.5levelBlack 4.867e-01  2.961e-01   1.644  0.10036
## race.ethnicity.5levelMixed 6.851e-01  2.960e-01   2.314  0.02073 *
## race.ethnicity.5levelOther 5.019e-01  3.410e-01   1.472  0.14115
## race.ethnicity.5levelWhite 5.134e-01  2.764e-01   1.857  0.06336 .
## interview_age          6.888e-04  5.681e-03   0.121  0.90351
## demo_race_hispanic1    -5.283e-02  1.173e-01  -0.450  0.65253
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00271
## lmer.REML = 11527  Scale est. = 2.9327    n = 2652

##              stdcoef      stdse
## X(Intercept)      0.0000000000 0.00000000
## Xhormone_scr_ert_mean -0.0005939289 0.02031284
## Xpds_p_ss_categoryEarly  0.0518430407 0.02030465
## Xpds_p_ss_categoryLate   0.0019396794 0.01940460
## Xpds_p_ss_categoryMid    0.0537311462 0.02042575
## Xrace.ethnicity.5levelBlack 0.0802963150 0.04885085
## Xrace.ethnicity.5levelMixed 0.1056953198 0.04566977
## Xrace.ethnicity.5levelOther 0.0501713136 0.03408466
## Xrace.ethnicity.5levelWhite 0.1140845195 0.06142144
## Xinterview_age        0.0024294941 0.02003812
## Xdemo_race_hispanic1  -0.0098629123 0.02190270

```

## 2—Reward~Puberty—

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

#### Female participants

```
##
## 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)  0.395325   0.306068   1.292  0.19660
## PDS_score    0.074583   0.027051   2.757  0.00587 **
## interview_age -0.004766   0.002627  -1.814  0.06972 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00449
## lmer.REML = 7545.1  Scale est. = 0.7525    n = 2690

##           stdcoef      stdse
## X(Intercept)  0.00000000 0.00000000
## XPDS_score    0.05558130 0.02015902
## Xinterview_age -0.03622943 0.01996716
```

#### Male participants

```
##
## 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)  0.171405   0.289344   0.592  0.55363
## PDS_score    0.091570   0.033981   2.695  0.00708 **
## interview_age -0.001888   0.002449  -0.771  0.44078
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0027
## lmer.REML = 8055.6  Scale est. = 0.73985    n = 2908

##           stdcoef      stdse
```



```
## X(Intercept)      0.00000000 0.00000000
## XPDS_score        0.05135684 0.01905805
## Xinterview_age    -0.01459209 0.01892679
```

## 2.2 Model : Reaction Time ~ PDS

### Female participants

```
##
## 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)  -0.572358   0.316549  -1.808   0.0707 .
## PDS_score     -0.020889   0.028535  -0.732   0.4642
## interview_age  0.005457   0.002728   2.000   0.0456 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00104
## lmer.REML =  5938   Scale est. = 0.67938   n = 2201

##              stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      -0.01620865 0.02214117
## Xinterview_age   0.04407552 0.02203886

##
## 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)  -0.349121   0.318183  -1.097   0.273
## PDS_score     -0.026958   0.028604  -0.942   0.346
## interview_age  0.003428   0.002742   1.250   0.211
##
##
## R-sq.(adj) =  0.000134
## lmer.REML = 5963.2   Scale est. = 0.77188   n = 2201

##              stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      -0.02082256 0.02209392
## Xinterview_age   0.02756625 0.02204520
```

## Male participants

```
##
## 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)   0.1111430  0.2929755   0.379   0.7045
## PDS_score     -0.0632857  0.0355353  -1.781   0.0751 .
## interview_age -0.0003222  0.0024828  -0.130   0.8968
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000741
## lmer.REML = 5939.1  Scale est. = 0.71204   n = 2297

##               stdcoef      stdse
## X(Intercept)   0.000000000 0.00000000
## XPDS_score     -0.037980395 0.02132623
## Xinterview_age -0.002759926 0.02126704

##
## 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)   0.0232816  0.2965386   0.079   0.937
## PDS_score     -0.0239408  0.0358885  -0.667   0.505
## interview_age  0.0001343  0.0025139   0.053   0.957
##
##
## R-sq.(adj) = -0.000678
## lmer.REML =   6016  Scale est. = 0.79698   n = 2297

##               stdcoef      stdse
## X(Intercept)   0.000000000 0.00000000
## XPDS_score     -0.014143995 0.02120258
## Xinterview_age  0.001132671 0.02119757
```

## 2.3 Model: Caudate Anticipation ~ PDS

### Female participants

```
##
```

```

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

##           stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      -0.03986291 0.02304081
## Xinterview_age   0.04069642 0.02292625

```

## Male participants

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsnt_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.186131   0.341694  -0.545   0.586
## PDS_score    -0.008219   0.041635  -0.197   0.844
## interview_age  0.001612   0.002897   0.556   0.578
##
##
## R-sq.(adj) = -0.000776
## lmer.REML = 5730.1  Scale est. = 0.78555    n = 2060

##           stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      -0.004462425 0.02260454
## Xinterview_age   0.012518023 0.02249980

```

## 2.4 Model B: Putamen Anticipation ~ PDS

### Female participants

```
##
```

```

## 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

##           stdcoef      stdse
## X(Intercept)  0.00000000 0.00000000
## XPDS_score    -0.06444037 0.02302285
## Xinterview_age 0.03643015 0.02291392

```

## Male participants

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsnt_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.422958   0.329720  -1.283   0.200
## PDS_score     0.005677   0.040377   0.141   0.888
## interview_age  0.003507   0.002797   1.254   0.210
##
##
## R-sq.(adj) = -9.18e-05
## lmer.REML = 5571.2  Scale est. = 0.85641  n = 2057

##           stdcoef      stdse
## X(Intercept)  0.00000000 0.00000000
## XPDS_score    0.003177134 0.02259754
## Xinterview_age 0.028240686 0.02252802

```

## 2.5 Model: Accumbens Anticipation ~ PDS

### Female participants

```
##
```

```

## 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

##               stdcoef      stdse
## X(Intercept)    0.0000000000 0.00000000
## XPDS_score      -0.0009005018 0.02307352
## Xinterview_age  0.0099580823 0.02295055

```

## Male participants

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.324185   0.256773   1.263   0.207
## PDS_score       0.004833   0.031187   0.155   0.877
## interview_age  -0.002717   0.002178  -1.247   0.212
##
##
## R-sq.(adj) =  -0.000206
## lmer.REML = 4574.9  Scale est. = 0.51375   n = 2059

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score       0.00347335 0.02241537
## Xinterview_age  -0.02794604 0.02240798

```

## 2.6 Model: Caudate Feedback ~ PDS

### Female participants

```

##
## 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

##           stdcoef      stdse
## X(Intercept)  0.00000000 0.00000000
## XPDS_score    -0.01771233 0.02278498
## Xinterview_age -0.06327810 0.02278498
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.035148   0.308762  -0.114   0.9094
## PDS_score    -0.077997   0.037515  -2.079   0.0377 *
## interview_age  0.001494   0.002619   0.570   0.5686
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00119
## lmer.REML = 5321.7  Scale est. = 0.77007  n = 2058

##           stdcoef      stdse
## X(Intercept)  0.00000000 0.00000000
## XPDS_score    -0.04660337 0.02241512
## Xinterview_age  0.01277557 0.02240242
```

## 2.7 Model: Putamen Feedback ~ PDS

### Female participants

```
##
```

```
## 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

##           stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    0.004926153 0.02291867
## Xinterview_age -0.046761914 0.02287379
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.2523532  0.3084372   0.818   0.413
## PDS_score    -0.0586858  0.0374986  -1.565   0.118
## interview_age -0.0007996  0.0026095  -0.306   0.759
##
##
## R-sq.(adj) =  0.000261
## lmer.REML = 5293.1  Scale est. = 0.75008  n = 2061

##           stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    -0.035327960 0.02257361
## Xinterview_age -0.006884135 0.02246763
```

## 2.8 Model: Accumbens Feedback ~ PDS

### Female participants

```
##
```

```
## 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

##           stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    -0.001122932 0.02280433
## Xinterview_age -0.045142102 0.02278977
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.068876   0.248955  -0.277   0.782
## PDS_score    -0.040808   0.030313  -1.346   0.178
## interview_age  0.001428   0.002110   0.677   0.499
##
##
## R-sq.(adj) = -4.31e-05
## lmer.REML = 4395.9  Scale est. = 0.42192   n = 2054

##           stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    -0.03050319 0.02265835
## Xinterview_age  0.01525776 0.02254534
```

## 2.9 Model: OFC Anticipation ~ PDS

### Female participants

```
##
```



```
## Family: gaussian
## Link function: identity
##
## Formula:
## l0FC_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
```

```
##           stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    0.004699434 0.02295576
## Xinterview_age -0.005755180 0.02291520
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## m0FC_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
```

```
##           stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    0.008856036 0.02287269
## Xinterview_age -0.004880368 0.02287269
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## l0FC_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
```

```

##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.222499   0.216526  -1.028   0.304
## PDS_score      0.027361   0.026581   1.029   0.303
## interview_age  0.001621   0.001839   0.882   0.378
##
##
## R-sq.(adj) =  0.000144
## lmer.REML = 3835.2  Scale est. = 0.34288   n = 2053

##               stdcoef      stdse
## X(Intercept)   0.00000000 0.00000000
## XPDS_score     0.02328767 0.02262399
## Xinterview_age 0.01987765 0.02254881

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -1.019e-01  2.360e-01  -0.432   0.6658
## PDS_score      7.386e-02  2.880e-02   2.565   0.0104 *
## interview_age  2.244e-05  2.005e-03   0.011   0.9911
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00234
## lmer.REML = 4188.7  Scale est. = 0.40149   n = 2048

##               stdcoef      stdse
## X(Intercept)   0.000000000 0.00000000
## XPDS_score     0.0577094026 0.02250055
## Xinterview_age 0.0002516722 0.02248097

```

## 2.10 Model: OFC Feedback ~ PDS

### Female participants

```

##
## 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

##                stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      0.01423897 0.02291448
## Xinterview_age -0.03622689 0.02286299

##
## 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

##                stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      0.011820358 0.02306259
## Xinterview_age -0.009053689 0.02295243

```

## Male participants

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.255747  0.195270  -1.310   0.190
## PDS_score    0.008412  0.023793   0.354   0.724
## interview_age 0.002314  0.001657   1.396   0.163
##
##
## R-sq.(adj) = 0.000154
## lmer.REML = 3464.9  Scale est. = 0.30926  n = 2063

```

```

##               stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    0.007913114 0.02238156
## Xinterview_age 0.031243174 0.02238067

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.0388540  0.2246313  -0.173   0.863
## PDS_score      0.0051199  0.0274503   0.187   0.852
## interview_age  0.0005642  0.0019075   0.296   0.767
##
##
## R-sq.(adj) = -0.000943
## lmer.REML = 4026.3  Scale est. = 0.31384  n = 2061

##               stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    0.004195959 0.02249664
## Xinterview_age 0.006638855 0.02244611

```

## 2.11 Model: Caudate Anticipation ~ Testosterone

### Female participants

```

##
## 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

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.02656944 0.02367206
## Xinterview_age     0.04181201 0.02352831

```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvs_n_ant_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0749252  0.3460507  -0.217   0.829
## hormone_scr_ert_mean  0.0005271  0.0014419   0.366   0.715
## interview_age    0.0004707  0.0029241   0.161   0.872
##
##
## R-sq.(adj) =  -0.00095
## lmer.REML =   5192  Scale est. = 0.68188    n = 1902

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.008604649 0.02353898
## Xinterview_age      0.003757341 0.02333946
```

## 2.12 Model B: Putamen Anticipation ~ Testosterone

### Female participants

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

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.01866909 0.02369479
## Xinterview_age      0.02718732 0.02355821
```

### Male participants

```
##
```

```
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsnt_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.363244   0.342533  -1.060   0.289
## hormone_scr_ert_mean 0.002011   0.001432   1.405   0.160
## interview_age    0.002573   0.002891   0.890   0.374
##
##
## R-sq.(adj) =  0.000718
## lmer.REML =  5149  Scale est. = 0.75484  n = 1902

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean 0.03316219 0.02361121
## Xinterview_age     0.02075429 0.02332550
```

## 2.13 Model: Accumbens Anticipation ~ Testosterone

### Female participants

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

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.04006650 0.02364976
## Xinterview_age     0.02337654 0.02353300
```

### Male participants

```
##
```

```
## 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)    3.226e-01  2.699e-01   1.195   0.232
## hormone_scr_ert_mean -8.252e-05  1.113e-03  -0.074   0.941
## interview_age    -2.616e-03  2.280e-03  -1.148   0.251
##
##
## R-sq.(adj) =  -0.000323
## lmer.REML = 4277.2  Scale est. = 0.50131   n = 1905

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.001723489 0.02325383
## Xinterview_age    -0.026653729 0.02322433
```

## 2.14 Model: Caudate Feedback ~ Testosterone

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.04890655 0.02341514
## Xinterview_age    -0.07902547 0.02341514
```

### Male participants

```
##
```

```
## 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)    0.0717921  0.3203480   0.224   0.823
## hormone_scr_ert_mean 0.0016157  0.0013266   1.218   0.223
## interview_age   -0.0006652  0.0027075  -0.246   0.806
##
##
## R-sq.(adj) = -0.000306
## lmer.REML = 4914.7  Scale est. = 0.76342  n = 1903

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.028461130 0.02336805
## Xinterview_age  -0.005716953 0.02326983
```

## 2.15 Model: Putamen Feedback ~ Testosterone

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.06777610 0.02347543
## Xinterview_age  -0.06051217 0.02344254
```

### Male participants

```
##
```



```
## 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)    0.400731   0.318183   1.259   0.208
## hormone_scr_ert_mean 0.001473   0.001325   1.112   0.266
## interview_age   -0.003093   0.002680  -1.154   0.248
##
##
## R-sq.(adj) =  -0.00011
## lmer.REML = 4880.1  Scale est. = 0.73977   n = 1907

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## Xhormone_scr_ert_mean 0.02618158 0.02355376
## Xinterview_age  -0.02681733 0.02322933
```

## 2.16 Model: Accumbens Feedback ~ Testosterone

### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## Xhormone_scr_ert_mean 0.009488918 0.02346939
## Xinterview_age  -0.051581945 0.02344264
```

### Male participants

```
##
```

```

## 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)    0.0489839  0.2610065   0.188   0.851
## hormone_scr_ert_mean 0.0014432  0.0010875   1.327   0.185
## interview_age   -0.0003314  0.0022052  -0.150   0.881
##
##
## R-sq.(adj) = 8.13e-05
## lmer.REML = 4104.6  Scale est. = 0.43257  n = 1899

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.031321924 0.02360226
## Xinterview_age  -0.003511598 0.02336325

```

## 2.17 Model: OFC Anticipation ~ Testosterone

### Female participants

```

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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.018620645 0.02356633
## Xinterview_age     0.003757456 0.02354156

##
## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.004606623 0.02352115
## Xinterview_age  -0.006950428 0.02352115
```

## Male participants

```
##
## 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)   -0.2768395  0.2264293  -1.223   0.2216
## hormone_scr_ert_mean -0.0015935  0.0009445  -1.687   0.0917 .
## interview_age    0.0028287  0.0019125   1.479   0.1393
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0012
## lmer.REML = 3579.8  Scale est. = 0.33303  n = 1899

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## Xhormone_scr_ert_mean -0.03950549 0.02341628
## Xinterview_age    0.03445050 0.02329201

##
## 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)   -0.204876  0.247282  -0.829   0.407
```

```
## hormone_scr_ert_mean -0.001011  0.001023 -0.988    0.323
## interview_age        0.002031  0.002091  0.972    0.331
##
##
## R-sq.(adj) = -0.000234
## lmer.REML = 3910.2  Scale est. = 0.40564    n = 1895

##                      stdcoef      stdse
## X(Intercept)          0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.02309696 0.02337852
## Xinterview_age        0.02266259 0.02332311
```

## 2.18 Model: OFC Feedback ~ Testosterone

### Female participants

```
##
## 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

##                      stdcoef      stdse
## X(Intercept)          0.00000000 0.00000000
## Xhormone_scr_ert_mean  0.03876310 0.02352205
## Xinterview_age        -0.04343638 0.02348011

##
## 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
```

```
##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean 0.01931141 0.02369241
## Xinterview_age     -0.01591504 0.02357242
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## l0FC_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.1175909  0.2030853  -0.579   0.563
## hormone_scr_ert_mean 0.0000585  0.0008427   0.069   0.945
## interview_age     0.0012925  0.0017167   0.753   0.452
##
##
## R-sq.(adj) = -0.000733
## lmer.REML = 3216.5  Scale est. = 0.31125  n = 1909
```

```
##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## Xhormone_scr_ert_mean 0.001609679 0.02318664
## Xinterview_age     0.017456649 0.02318664
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## m0FC_posvsneg_feedback_z ~ hormone_scr_ert_mean + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0374550  0.2352774   0.159   0.874
## hormone_scr_ert_mean 0.0007922  0.0009749   0.813   0.417
## interview_age     -0.0001889  0.0019895  -0.095   0.924
##
##
## R-sq.(adj) = -0.000776
## lmer.REML = 3761.8  Scale est. = 0.32397  n = 1907
```

```
##               stdcoef      stdse
```

```
## X(Intercept)          0.000000000 0.00000000
## Xhormone_scr_ert_mean 0.018919183 0.02328135
## Xinterview_age       -0.002207377 0.02324932
```

## 2.19 Model: MID Reaction Time ~ Testosterone

### Female participants

```
##
## 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)   -0.633165   0.323079  -1.960   0.0502 .
## hormone_scr_ert_mean -0.001511   0.001287  -1.174   0.2406
## interview_age    0.006170   0.002767   2.230   0.0259 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) = 0.00188
## lmer.REML = 5547.5  Scale est. = 0.69017  n = 2060

##              stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.02654532 0.02261336
## Xinterview_age      0.05031463 0.02256225

##
## 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)   -0.3696554   0.3262044  -1.133   0.257
## hormone_scr_ert_mean -0.0008419   0.0012986  -0.648   0.517
## interview_age    0.0034240   0.0027933   1.226   0.220
##
## R-sq.(adj) = 4.58e-06
## lmer.REML = 5587.6  Scale est. = 0.75055  n = 2060

##              stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.01466609 0.02262339
## Xinterview_age      0.02768875 0.02258842
```

## Male participants

```
##
## 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)    0.0837097  0.3030565   0.276   0.782
## hormone_scr_ert_mean -0.0006574  0.0012592  -0.522   0.602
## interview_age    -0.0006073  0.0025605  -0.237   0.813
##
##
## R-sq.(adj) =  -0.000719
## lmer.REML = 5514.9  Scale est. = 0.71939   n = 2133

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.01157785 0.02217728
## Xinterview_age     -0.00522356 0.02202364

##
## 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)    0.1149651  0.3045511   0.377   0.706
## hormone_scr_ert_mean -0.0013004  0.0012582  -1.034   0.301
## interview_age    -0.0004868  0.0025746  -0.189   0.850
##
##
## R-sq.(adj) =  -0.000388
## lmer.REML = 5554.6  Scale est. = 0.77615   n = 2133

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.022694149 0.02195786
## Xinterview_age     -0.004149015 0.02194322
```

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

### Female participants

```
##
## 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)    0.346829   0.314583   1.103   0.270
## hormone_scr_ert_mean -0.001039  0.001247  -0.833   0.405
## interview_age    -0.002943   0.002683  -1.097   0.273
##
##
## R-sq.(adj) =  0.000485
## lmer.REML = 7026.8  Scale est. = 0.70702   n = 2502
```

  

```
##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## Xhormone_scr_ert_mean -0.01725639 0.02071182
## Xinterview_age   -0.02254169 0.02055015
```

## Male participants

```
##
## 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)    0.206422   0.298770   0.691   0.4897
## hormone_scr_ert_mean 0.002087  0.001241   1.682   0.0927 .
## interview_age    -0.001662   0.002524  -0.658   0.5103
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00097
## lmer.REML = 7467.5  Scale est. = 0.72308   n = 2698
```

  

```
##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## Xhormone_scr_ert_mean 0.03364639 0.02000537
## Xinterview_age   -0.01293329 0.01964147
```



### 3—Internalizing~Reward—

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

##### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      6.03142    1.86213   3.239  0.00122 **
## accumbens_rvsnt_ant_z -0.04281    0.16866  -0.254  0.79968
## interview_age     -0.00972    0.01557  -0.624  0.53257
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000632
## lmer.REML = 12626 Scale est. = 11.232    n = 2044

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## Xaccumbens_rvsnt_ant_z -0.005427053 0.02138326
## Xinterview_age     -0.013435302 0.02152431
```

##### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.25746    1.86102   1.750  0.0802 .
## accumbens_rvsnt_ant_z -0.14197    0.15732  -0.902  0.3669
## interview_age      0.01252    0.01550   0.808  0.4195
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000586
## lmer.REML = 12672 Scale est. = 18.374    n = 2059
```

```
##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xaccumbens_rvs_n_ant_z -0.01970131 0.02183160
## Xinterview_age      0.01786603 0.02212499
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_rvs_n_ant_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      6.09957    1.86424   3.272  0.00109 **
## caudate_rvs_n_ant_z -0.02686    0.12935  -0.208  0.83552
## interview_age     -0.01023    0.01559  -0.656  0.51174
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000647
## lmer.REML = 12629  Scale est. = 11.292    n = 2044

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## Xcaudate_rvs_n_ant_z -0.004436974 0.02136731
## Xinterview_age      -0.014126520 0.02152610
```

#### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_rvs_n_ant_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.49750    1.86404   1.876  0.0608 .
## caudate_rvs_n_ant_z -0.10650    0.12325  -0.864  0.3876
## interview_age      0.01067    0.01552   0.687  0.4919
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000812
## lmer.REML = 12656  Scale est. = 18.614    n = 2056
```

```
##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xcaudate_rvsnt_ant_z -0.01892928 0.02190619
## Xinterview_age      0.01521727 0.02213864
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      5.934388   1.857662   3.195  0.00142 **
## putamen_rvsnt_ant_z -0.095198   0.132427  -0.719  0.47230
## interview_age      -0.008957   0.015537  -0.577  0.56434
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000598
## lmer.REML = 12595  Scale est. = 11.211    n = 2041

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xputamen_rvsnt_ant_z -0.01538262 0.02139824
## Xinterview_age      -0.01242203 0.02154710
```

#### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.35048   1.85734   1.804  0.0714 .
## putamen_rvsnt_ant_z -0.15563   0.12301  -1.265  0.2060
## interview_age      0.01181   0.01547   0.763  0.4453
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000471
## lmer.REML = 12647  Scale est. = 18.132    n = 2057
```

```
##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xputamen_rvsnt_ant_z -0.02763637 0.02184387
## Xinterview_age      0.01688681 0.02212169
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      5.830691   1.856144   3.141  0.00171 **
## accumbens_posvsneg_feedback_z -0.050476   0.176282  -0.286  0.77465
## interview_age     -0.008162   0.015527  -0.526  0.59916
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000578
## lmer.REML = 12646 Scale est. = 11.21      n = 2050

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## Xaccumbens_posvsneg_feedback_z -0.006103001 0.02131392
## Xinterview_age     -0.011313685 0.02152144
```

#### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.20768   1.84860   1.735  0.0829 .
## accumbens_posvsneg_feedback_z 0.32112   0.16304   1.970  0.0490 *
## interview_age      0.01259   0.01539   0.818  0.4137
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000399
## lmer.REML = 12603 Scale est. = 18.899      n = 2054
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.00000000 0.00000000
## Xaccumbens_posvsneg_feedback_z 0.04319714 0.02193190
## Xinterview_age                0.01808956 0.02212641
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    6.08504    1.86838   3.257  0.00115 **
## caudate_posvsneg_feedback_z -0.18760    0.13267  -1.414  0.15750
## interview_age   -0.01029    0.01562  -0.659  0.51010
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000878
## lmer.REML = 12610 Scale est. = 11.326    n = 2042

##                                stdcoef      stdse
## X(Intercept)                  0.00000000 0.00000000
## Xcaudate_posvsneg_feedback_z -0.02984372 0.02110522
## Xinterview_age                -0.01421366 0.02157502
```

#### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.781203    1.865165   2.027  0.0428 *
## caudate_posvsneg_feedback_z 0.141738    0.131057   1.082  0.2796
## interview_age    0.008144    0.015537   0.524  0.6002
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000857
## lmer.REML = 12670 Scale est. = 18.536    n = 2058
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.00000000 0.00000000
## Xcaudate_posvsneg_feedback_z  0.02360106 0.02182246
## Xinterview_age                0.01159805 0.02212483
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                  5.870302   1.864372   3.149  0.00166 **
## putamen_posvsneg_feedback_z -0.099433   0.139287  -0.714  0.47539
## interview_age                -0.008449   0.015591  -0.542  0.58795
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000157
## lmer.REML = 12610 Scale est. = 11.281 n = 2042

##                                stdcoef      stdse
## X(Intercept)                  0.00000000 0.00000000
## Xputamen_posvsneg_feedback_z -0.01507505 0.02111722
## Xinterview_age                -0.01167656 0.02154777
```

#### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                  3.54548    1.86842   1.898  0.0579 .
## putamen_posvsneg_feedback_z  0.13679    0.13284   1.030  0.3032
## interview_age                0.01013    0.01556   0.651  0.5149
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.00108
## lmer.REML = 12701 Scale est. = 18.877 n = 2061
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.00000000 0.00000000
## Xputamen_posvsneg_feedback_z 0.02257279 0.02192055
## Xinterview_age                0.01439570 0.02210408
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   5.886252   1.871858   3.145  0.00169 **
## lOFC_rvsnt_ant_z 0.028463   0.202850   0.140  0.88843
## interview_age -0.008492   0.015651  -0.543  0.58746
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000729
## lmer.REML = 12589 Scale est. = 11.525 n = 2038
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.000000000
## XlOFC_rvsnt_ant_z             0.003020377 0.02152582
## Xinterview_age                -0.011738081 0.02163280
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   5.859094   1.868796   3.135  0.00174 **
## mOFC_rvsnt_ant_z 0.158153   0.173166   0.913  0.36119
## interview_age -0.008187   0.015629  -0.524  0.60045
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000132
## lmer.REML = 12597 Scale est. = 11.352 n = 2039
```

```
##                                stdcoef      stdse
```

```
## X(Intercept)      0.00000000 0.00000000
## XmOFC_rvsnt_ant_z 0.01926434 0.02109318
## Xinterview_age    -0.01129104 0.02155432
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.59775    1.84642   1.407   0.160
## lOFC_rvsnt_ant_z 0.01023    0.18646   0.055   0.956
## interview_age   0.01775    0.01538   1.155   0.248
##
##
## R-sq.(adj) = -0.000919
## lmer.REML = 12592 Scale est. = 18.062    n = 2053
```

```
##              stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XlOFC_rvsnt_ant_z 0.001201186 0.02190392
## Xinterview_age   0.025574945 0.02215096
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_rvsnt_ant_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.66849    1.85435   1.439   0.150
## mOFC_rvsnt_ant_z 0.25414    0.17105   1.486   0.137
## interview_age   0.01724    0.01544   1.116   0.264
##
##
## R-sq.(adj) = 0.000328
## lmer.REML = 12576 Scale est. = 18.194    n = 2048
```

```
##              stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XmOFC_rvsnt_ant_z 0.03252081 0.02188820
## Xinterview_age   0.02474006 0.02216395
```



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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.888613   1.861224   3.164  0.00158 **
## lOFC_posvsneg_feedback_z -0.237566   0.228693  -1.039  0.29902
## interview_age   -0.008663   0.015572  -0.556  0.57803
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  4.13e-05
## lmer.REML = 12579 Scale est. = 11.213    n = 2039

##              stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## XlOFC_posvsneg_feedback_z -0.02224531 0.02141444
## Xinterview_age     -0.01200652 0.02158089

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.973940   1.863262   3.206  0.00137 **
## mOFC_posvsneg_feedback_z -0.159334   0.188165  -0.847  0.39722
## interview_age   -0.009333   0.015591  -0.599  0.54951
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000255
## lmer.REML = 12595 Scale est. = 11.397    n = 2040

##              stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## XmOFC_posvsneg_feedback_z -0.01821223 0.02150767
## Xinterview_age     -0.01289717 0.02154552
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ l0FC_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.13068    1.84350   1.698   0.0896 .
## l0FC_posvsneg_feedback_z  0.06848    0.20435   0.335   0.7376
## interview_age    0.01345    0.01535   0.876   0.3810
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.00105
## lmer.REML = 12663 Scale est. = 18.043    n = 2063

##              stdcoef      stdse
## X(Intercept)    0.000000000 0.000000000
## Xl0FC_posvsneg_feedback_z 0.007299579 0.02178333
## Xinterview_age   0.019366812 0.02210083

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ m0FC_posvsneg_feedback_z + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.17570    1.84275   1.723   0.085 .
## m0FC_posvsneg_feedback_z  0.26532    0.17873   1.484   0.138
## interview_age    0.01304    0.01535   0.850   0.396
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000177
## lmer.REML = 12652 Scale est. = 18.142    n = 2061

##              stdcoef      stdse
## X(Intercept)    0.000000000 0.000000000
## Xm0FC_posvsneg_feedback_z 0.03243102 0.02184718
## Xinterview_age   0.01875492 0.02207703
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ bisbas_ss_basm_rr + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   4.576754   1.717826   2.664  0.00776 **
## bisbas_ss_basm_rr -0.070300   0.044419  -1.583  0.11362
## interview_age   0.008269   0.013933   0.593  0.55293
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000292
## lmer.REML = 16721 Scale est. = 12.884 n = 2690

##              stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xbisbas_ss_basm_rr -0.02987863 0.01887900
## Xinterview_age     0.01127390 0.01899736
```

#### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ bisbas_ss_basm_rr + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   3.61046   1.69125   2.135  0.0329 *
## bisbas_ss_basm_rr 0.01025   0.04427   0.231  0.8169
## interview_age   0.01103   0.01370   0.805  0.4209
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000755
## lmer.REML = 18150 Scale est. = 16.374 n = 2908

##              stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xbisbas_ss_basm_rr 0.004259592 0.01840036
## Xinterview_age     0.014952359 0.01857515
```

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_neutral_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      6.34845    1.78964   3.547 0.000397 ***
## rt_diff_large_neutral_z  0.13672    0.12031   1.136 0.255921
## interview_age     -0.01246    0.01495  -0.833 0.404751
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -5.14e-06
## lmer.REML = 13581  Scale est. = 11.707    n = 2201

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xrt_diff_large_neutral_z  0.02353331 0.02070898
## Xinterview_age     -0.01731784 0.02078157

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_small_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      6.25233    1.78792   3.497 0.00048 ***
## rt_diff_large_small_z -0.15739    0.11917  -1.321 0.18675
## interview_age     -0.01158    0.01493  -0.775 0.43813
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  -0.000251
## lmer.REML = 13580  Scale est. = 11.639    n = 2201

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## Xrt_diff_large_small_z -0.02721487 0.02060706
## Xinterview_age     -0.01609858 0.02075907
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_neutral_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.95337    1.77854   1.661   0.0969 .
## rt_diff_large_neutral_z 0.04500    0.12536   0.359   0.7197
## interview_age   0.01547    0.01482   1.044   0.2965
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000758
## lmer.REML = 14182 Scale est. = 17.631 n = 2297

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## Xrt_diff_large_neutral_z 0.00742118 0.02067627
## Xinterview_age  0.02185601 0.02093084

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_small_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.96179    1.77843   1.665   0.096 .
## rt_diff_large_small_z -0.07562    0.12322  -0.614   0.539
## interview_age   0.01540    0.01481   1.040   0.299
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000672
## lmer.REML = 14181 Scale est. = 17.688 n = 2297

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## Xrt_diff_large_small_z -0.01266907 0.02064481
## Xinterview_age  0.02175852 0.02092903
```

## 4—Internalizing~Puberty x Reward—

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

#### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * accumbens_rvsn_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_rvsn_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_rvsn_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

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      0.08899043 0.02382796
## Xaccumbens_rvsn_ant_z -0.09396490 0.05399451
## Xrace.ethnicity.5levelBlack  0.03339004 0.05454371
## Xrace.ethnicity.5levelMixed  0.14413866 0.05382876
## Xrace.ethnicity.5levelOther  0.09479789 0.04007102
## Xrace.ethnicity.5levelWhite  0.11707848 0.07121143
## Xdemo_race_hispanic1    0.03675147 0.02585679
## Xinterview_age    -0.03088277 0.02242913
## XPDS_score:accumbens_rvsn_ant_z  0.09588237 0.05382300
```

#### Male participants

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

```

## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * accumbens_rvsnt_z +
##     race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.105143    2.013195   0.549  0.58310
## PDS_score         0.744167    0.231992   3.208  0.00136 **
## accumbens_rvsnt_z -0.182527    0.432717  -0.422  0.67321
## race.ethnicity.5levelBlack  1.141776    0.870109   1.312  0.18960
## race.ethnicity.5levelMixed  2.816734    0.860474   3.273  0.00108 **
## race.ethnicity.5levelOther  2.802547    0.990415   2.830  0.00471 **
## race.ethnicity.5levelWhite  2.105762    0.809086   2.603  0.00932 **
## demo_race_hispanic1    0.032827    0.334966   0.098  0.92194
## interview_age         0.004667    0.015736   0.297  0.76681
## PDS_score:accumbens_rvsnt_z  0.032985    0.298462   0.111  0.91201
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.01
## lmer.REML = 12349 Scale est. = 18.343    n = 2017

##
##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## XPDS_score        0.075294613 0.02347290
## Xaccumbens_rvsnt_z -0.025438342 0.06030683
## Xrace.ethnicity.5levelBlack  0.071353141 0.05437581
## Xrace.ethnicity.5levelMixed  0.178180769 0.05443179
## Xrace.ethnicity.5levelOther  0.110302206 0.03898061
## Xrace.ethnicity.5levelWhite  0.186781241 0.07176600
## Xdemo_race_hispanic1    0.002517770 0.02569164
## Xinterview_age        0.006725127 0.02267481
## XPDS_score:accumbens_rvsnt_z  0.006671157 0.06036306

```

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

### Female participants

```

##
## 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_ant_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

##                                stdcoef      stdse
## X(Intercept)                  0.00000000 0.00000000
## XPDS_score                    0.09168964 0.02386600
## Xcaudate_rvsnt_ant_z          -0.01968152 0.05343153
## Xrace.ethnicity.5levelBlack   0.03330435 0.05437603
## Xrace.ethnicity.5levelMixed   0.14172435 0.05404239
## Xrace.ethnicity.5levelOther   0.09311051 0.04005049
## Xrace.ethnicity.5levelWhite   0.11491193 0.07126832
## Xdemo_race_hispanic1          0.03640186 0.02582355
## Xinterview_age                -0.03354718 0.02251966
## XPDS_score:caudate_rvsnt_ant_z 0.01524638 0.05340356
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * caudate_rvsnt_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                  1.335424    2.020919   0.661 0.508816
## PDS_score                    0.766072    0.231952   3.303 0.000974 ***
## caudate_rvsnt_ant_z          0.282502    0.351648   0.803 0.421859
## race.ethnicity.5levelBlack   1.034625    0.889356   1.163 0.244829
## race.ethnicity.5levelMixed   2.698696    0.880718   3.064 0.002212 **
## race.ethnicity.5levelOther   2.779288    1.004888   2.766 0.005731 **
## race.ethnicity.5levelWhite   2.023427    0.830117   2.438 0.014875 *
## demo_race_hispanic1          0.055234    0.336414   0.164 0.869603
## interview_age                0.003298    0.015749   0.209 0.834160
## PDS_score:caudate_rvsnt_ant_z -0.297277    0.244097  -1.218 0.223418
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0104
```



```
## lmer.REML = 12338 Scale est. = 18.37 n = 2015
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.00000000
## XPDS_score                    0.077470881 0.02345668
## Xcaudate_rvs_n_ant_z          0.050628423 0.06302045
## Xrace.ethnicity.5levelBlack   0.064762432 0.05566931
## Xrace.ethnicity.5levelMixed   0.170105930 0.05551395
## Xrace.ethnicity.5levelOther   0.110541978 0.03996791
## Xrace.ethnicity.5levelWhite   0.179347856 0.07357803
## Xdemo_race_hispanic1         0.004223753 0.02572579
## Xinterview_age                0.004747977 0.02267455
## XPDS_score:caudate_rvs_n_ant_z -0.076813601 0.06307229
```

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

#### Female participants

```
##
## 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
```

```
##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.00000000
## XPDS_score                    0.09255025 0.02393170
## Xputamen_rvs_n_ant_z         -0.06021333 0.05246248
## Xrace.ethnicity.5levelBlack   0.03618439 0.05441955
## Xrace.ethnicity.5levelMixed   0.14390731 0.05394014
## Xrace.ethnicity.5levelOther   0.09322116 0.04013015
```

```
## Xrace.ethnicity.5levelWhite      0.11286005 0.07121149
## Xdemo_race_hispanic1             0.03777751 0.02589438
## Xinterview_age                   -0.03158244 0.02248890
## XPDS_score:putamen_rvsnt_ant_z   0.05394806 0.05231720
```

#### Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * putamen_rvsnt_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.097535    2.015001   0.545 0.586033
## PDS_score       0.793779    0.232575   3.413 0.000655 ***
## putamen_rvsnt_ant_z 0.681711    0.349735   1.949 0.051408 .
## race.ethnicity.5levelBlack 1.111177    0.886597   1.253 0.210240
## race.ethnicity.5levelMixed 2.732572    0.875784   3.120 0.001833 **
## race.ethnicity.5levelOther 2.662829    1.004894   2.650 0.008116 **
## race.ethnicity.5levelWhite 2.059703    0.827160   2.490 0.012851 *
## demo_race_hispanic1 -0.001105    0.335942  -0.003 0.997377
## interview_age     0.004782    0.015710   0.304 0.760864
## PDS_score:putamen_rvsnt_ant_z -0.637708    0.246660  -2.585 0.009797 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0125
## lmer.REML = 12328 Scale est. = 17.583    n = 2016

##              stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.0799458470 0.02342394
## Xputamen_rvsnt_ant_z 0.1218344044 0.06250409
## Xrace.ethnicity.5levelBlack 0.0694445332 0.05540909
## Xrace.ethnicity.5levelMixed 0.1740559719 0.05578460
## Xrace.ethnicity.5levelOther 0.1049969322 0.03962356
## Xrace.ethnicity.5levelWhite 0.1830151498 0.07349741
## Xdemo_race_hispanic1 -0.0000845667 0.02571651
## Xinterview_age    0.0068968450 0.02265804
## XPDS_score:putamen_rvsnt_ant_z -0.1616275006 0.06251620
```

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

##### Female participants

```
##
```

```

## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * l0FC_rvsn_ant_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 ***
## l0FC_rvsn_ant_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:l0FC_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

##              stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## XPDS_score        0.088727047 0.02398104
## Xl0FC_rvsn_ant_z   0.001601394 0.05479781
## Xrace.ethnicity.5levelBlack 0.031889966 0.05506718
## Xrace.ethnicity.5levelMixed 0.138259645 0.05448509
## Xrace.ethnicity.5levelOther 0.091050210 0.04073797
## Xrace.ethnicity.5levelWhite 0.108336858 0.07215133
## Xdemo_race_hispanic1 0.038283997 0.02601878
## Xinterview_age     -0.029496615 0.02260208
## XPDS_score:l0FC_rvsn_ant_z 0.007601278 0.05479157

```

## Male participants

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * l0FC_rvsn_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.43320    1.99732   0.217 0.82831
## PDS_score         0.65010    0.23340   2.785 0.00540 **
## l0FC_rvsn_ant_z   -0.47040    0.51114  -0.920 0.35753

```

```
## race.ethnicity.5levelBlack 1.16389 0.86244 1.350 0.17732
## race.ethnicity.5levelMixed 2.77910 0.85230 3.261 0.00113 **
## race.ethnicity.5levelOther 2.81399 0.97983 2.872 0.00412 **
## race.ethnicity.5levelWhite 2.03614 0.80073 2.543 0.01107 *
## demo_race_hispanic1 -0.05505 0.33262 -0.166 0.86856
## interview_age 0.01162 0.01563 0.743 0.45750
## PDS_score:lOFC_rvs_n_ant_z 0.33920 0.34826 0.974 0.33017
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00873
## lmer.REML = 12290 Scale est. = 17.836 n = 2014

##               stdcoef      stdse
## X(Intercept) 0.000000000 0.00000000
## XPDS_score 0.065971761 0.02368487
## XlOFC_rvs_n_ant_z -0.055571732 0.06038459
## Xrace.ethnicity.5levelBlack 0.072989147 0.05408490
## Xrace.ethnicity.5levelMixed 0.177068361 0.05430378
## Xrace.ethnicity.5levelOther 0.112541004 0.03918660
## Xrace.ethnicity.5levelWhite 0.182090163 0.07160877
## Xdemo_race_hispanic1 -0.004259226 0.02573431
## Xinterview_age 0.016891116 0.02273038
## XPDS_score:lOFC_rvs_n_ant_z 0.058918560 0.06049135
```

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

##### Female participants

```
##
## 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) 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
```

```
##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## XPDS_score        0.088811347 0.02387143
## XmOFC_rvsnt_ant_z -0.004478575 0.05300058
## Xrace.ethnicity.5levelBlack 0.031642800 0.05502242
## Xrace.ethnicity.5levelMixed 0.138775931 0.05435980
## Xrace.ethnicity.5levelOther 0.093688857 0.04053143
## Xrace.ethnicity.5levelWhite 0.112013216 0.07200151
## Xdemo_race_hispanic1 0.037053451 0.02592132
## Xinterview_age     -0.029046868 0.02250487
## XPDS_score:mOFC_rvsnt_ant_z 0.029045655 0.05294075
```

## Male participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * mOFC_rvsnt_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.622361   2.005242   0.310 0.75631
## PDS_score         0.686285   0.232818   2.948 0.00324 **
## mOFC_rvsnt_ant_z 0.217975   0.462027   0.472 0.63713
## race.ethnicity.5levelBlack 1.086841   0.866342   1.255 0.20980
## race.ethnicity.5levelMixed 2.697266   0.855655   3.152 0.00164 **
## race.ethnicity.5levelOther 2.781770   0.980968   2.836 0.00462 **
## race.ethnicity.5levelWhite 2.016291   0.803861   2.508 0.01221 *
## demo_race_hispanic1 -0.014152   0.332878  -0.043 0.96609
## interview_age      0.009891   0.015680   0.631 0.52825
## PDS_score:mOFC_rvsnt_ant_z 0.018780   0.301677   0.062 0.95037
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0102
## lmer.REML = 12260 Scale est. = 18.013 n = 2007
```

```
##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## XPDS_score        0.069700171 0.02364538
## XmOFC_rvsnt_ant_z 0.028062735 0.05948261
## Xrace.ethnicity.5levelBlack 0.067640207 0.05391732
## Xrace.ethnicity.5levelMixed 0.171479098 0.05439839
## Xrace.ethnicity.5levelOther 0.111613818 0.03935968
```

```
## Xrace.ethnicity.5levelWhite 0.179665859 0.07162969
## Xdemo_race_hispanic1 -0.001093349 0.02571684
## Xinterview_age 0.014339695 0.02273278
## XPDS_score:mOFC_rvsnt_ant_z 0.003714531 0.05966866
```

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

##### Female participants

```
##
## 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

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## XPDS_score         0.09184209 0.02383526
## Xaccumbens_posvsneg_feedback_z -0.04725519 0.05336031
## Xrace.ethnicity.5levelBlack      0.03353625 0.05473619
## Xrace.ethnicity.5levelMixed      0.13741419 0.05401235
```

```
## Xrace.ethnicity.5levelOther          0.09659968 0.04034147
## Xrace.ethnicity.5levelWhite          0.11721814 0.07145787
## Xdemo_race_hispanic1                 0.03133133 0.02590731
## Xinterview_age                       -0.03031982 0.02247321
## XPDS_score:accumbens_posvsneg_feedback_z 0.04536103 0.05314860
```

## Male participants

```
##
## 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)    9.718e-01  1.998e+00   0.486 0.626804
## PDS_score       7.123e-01  2.299e-01   3.098 0.001972
## accumbens_posvsneg_feedback_z 1.674e-02  4.468e-01   0.037 0.970122
## race.ethnicity.5levelBlack    1.244e+00  8.632e-01   1.441 0.149834
## race.ethnicity.5levelMixed    2.849e+00  8.519e-01   3.344 0.000842
## race.ethnicity.5levelOther    2.956e+00  9.815e-01   3.012 0.002628
## race.ethnicity.5levelWhite    2.101e+00  8.012e-01   2.623 0.008790
## demo_race_hispanic1          7.092e-05  3.327e-01   0.000 0.999830
## interview_age               5.707e-03  1.562e-02   0.365 0.714890
## PDS_score:accumbens_posvsneg_feedback_z 2.356e-01  3.046e-01   0.774 0.439232
##
## (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 = 12294 Scale est. = 18.671    n = 2014

##               stdcoef      stdse
## X(Intercept)    0.000000e+00 0.00000000
## XPDS_score      7.260536e-02 0.02343254
## Xaccumbens_posvsneg_feedback_z 2.270536e-03 0.06061325
## Xrace.ethnicity.5levelBlack    7.800362e-02 0.05414395
## Xrace.ethnicity.5levelMixed    1.815168e-01 0.05428687
## Xrace.ethnicity.5levelOther    1.174139e-01 0.03898166
```

```
## Xrace.ethnicity.5levelWhite          1.877074e-01 0.07157101
## Xdemo_race_hispanic1                 5.467682e-06 0.02565261
## Xinterview_age                       8.278766e-03 0.02265989
## XPDS_score:accumbens_posvsneg_feedback_z 4.694157e-02 0.06067585
```

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

##### Female participants

```
##
## 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

##                                stdcoef      stdse
## X(Intercept)                   0.00000000 0.00000000
## XPDS_score                     0.09443322 0.02390384
## Xcaudate_posvsneg_feedback_z   -0.06710132 0.05355554
## Xrace.ethnicity.5levelBlack     0.03356088 0.05453082
## Xrace.ethnicity.5levelMixed     0.13757834 0.05414223
## Xrace.ethnicity.5levelOther     0.08848400 0.04024316
## Xrace.ethnicity.5levelWhite     0.11053134 0.07137481
## Xdemo_race_hispanic1           0.03652502 0.02594028
## Xinterview_age                 -0.03447507 0.02253990
## XPDS_score:caudate_posvsneg_feedback_z 0.04368556 0.05401517
```

##### Male participants

```
##
## 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)    1.660869   2.025202   0.820 0.412256
## PDS_score      0.796861   0.232639   3.425 0.000626 ***
## caudate_posvsneg_feedback_z -0.151916  0.356251  -0.426 0.669840
## race.ethnicity.5levelBlack   1.121802  0.878802   1.277 0.201922
## race.ethnicity.5levelMixed   2.796188  0.869009   3.218 0.001313 **
## race.ethnicity.5levelOther   2.892817  0.994158   2.910 0.003656 **
## race.ethnicity.5levelWhite   2.070243  0.818202   2.530 0.011475 *
## demo_race_hispanic1         0.069761  0.335517   0.208 0.835313
## interview_age      -0.000388  0.015764  -0.025 0.980366
## PDS_score:caudate_posvsneg_feedback_z 0.207350  0.238202   0.870 0.384142
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0108
## lmer.REML = 12345  Scale est. = 18.427    n = 2016

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.080420355 0.02347821
## Xcaudate_posvsneg_feedback_z -0.025476897 0.05974461
## Xrace.ethnicity.5levelBlack   0.070193320 0.05498835
## Xrace.ethnicity.5levelMixed   0.176489565 0.05485002
## Xrace.ethnicity.5levelOther   0.115012321 0.03952564
## Xrace.ethnicity.5levelWhite   0.183604445 0.07256417
## Xdemo_race_hispanic1         0.005342790 0.02569638
## Xinterview_age      -0.000557737 0.02266052
## XPDS_score:caudate_posvsneg_feedback_z 0.052004275 0.05974202

```

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

##### Female participants

```

##
## 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

##                                stdcoef      stdse
## X(Intercept)                  0.00000000 0.00000000
## XPDS_score                    0.08956683 0.02392100
## Xputamen_posvsneg_feedback_z  0.00678795 0.05302087
## Xrace.ethnicity.5levelBlack    0.03880078 0.05456262
## Xrace.ethnicity.5levelMixed    0.14234404 0.05423465
## Xrace.ethnicity.5levelOther    0.09170833 0.03997370
## Xrace.ethnicity.5levelWhite    0.11455641 0.07138204
## Xdemo_race_hispanic1          0.03792995 0.02590293
## Xinterview_age                 -0.03010194 0.02249573
## XPDS_score:putamen_posvsneg_feedback_z -0.02279752 0.05330223
```

## Male participants

```
##
## 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)                  1.360166   2.020508   0.673 0.500910
## PDS_score                    0.762492   0.232428   3.281 0.001054 **
## putamen_posvsneg_feedback_z -0.309543   0.362742  -0.853 0.393572
## race.ethnicity.5levelBlack    1.160402   0.872609   1.330 0.183733
## race.ethnicity.5levelMixed    2.857744   0.862177   3.315 0.000934 ***
## race.ethnicity.5levelOther    2.924746   0.990420   2.953 0.003183 **
## race.ethnicity.5levelWhite    2.152726   0.811334   2.653 0.008033 **
## demo_race_hispanic1          0.006837   0.337189   0.020 0.983825
## interview_age                 0.002033   0.015773   0.129 0.897473
## PDS_score:putamen_posvsneg_feedback_z 0.332882   0.244131   1.364 0.172866
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) = 0.0108
## lmer.REML = 12387 Scale est. = 18.667 n = 2021

##                                stdcoef      stdse
## X(Intercept)                   0.000000000 0.00000000
## XPDS_score                     0.0768104463 0.02341388
## Xputamen_posvsneg_feedback_z   -0.0515747401 0.06043866
## Xrace.ethnicity.5levelBlack     0.0723038142 0.05437164
## Xrace.ethnicity.5levelMixed     0.1799263971 0.05428355
## Xrace.ethnicity.5levelOther     0.1157805167 0.03920727
## Xrace.ethnicity.5levelWhite     0.1903577875 0.07174331
## Xdemo_race_hispanic1           0.0005209947 0.02569557
## Xinterview_age                  0.0029171056 0.02263603
## XPDS_score:putamen_posvsneg_feedback_z 0.0823487608 0.06039344
```

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

### Female participants

```
##
## 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

##                                stdcoef      stdse
## X(Intercept)                   0.000000000 0.00000000
## XPDS_score                     0.09169905 0.02390497
## XlOFC_posvsneg_feedback_z      -0.06300960 0.05343331
## Xrace.ethnicity.5levelBlack     0.03338588 0.05450613
## Xrace.ethnicity.5levelMixed     0.13713763 0.05391830
```

```
## Xrace.ethnicity.5levelOther      0.09961996 0.03993810
## Xrace.ethnicity.5levelWhite      0.11286173 0.07118942
## Xdemo_race_hispanic1             0.03110200 0.02587032
## Xinterview_age                   -0.03063505 0.02252191
## XPDS_score:lOFC_posvsneg_feedback_z 0.04618863 0.05333658
```

#### Male participants

```
##
## 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)    0.979028   1.996429   0.490 0.623912
## PDS_score       0.708560   0.231559   3.060 0.002243 **
## lOFC_posvsneg_feedback_z -0.261914   0.565936  -0.463 0.643560
## race.ethnicity.5levelBlack    1.172783   0.864706   1.356 0.175163
## race.ethnicity.5levelMixed    2.822926   0.853873   3.306 0.000963 ***
## race.ethnicity.5levelOther    2.744911   0.984921   2.787 0.005371 **
## race.ethnicity.5levelWhite    2.056512   0.803007   2.561 0.010509 *
## demo_race_hispanic1          -0.003833   0.333298  -0.011 0.990826
## interview_age      0.006351   0.015611   0.407 0.684169
## PDS_score:lOFC_posvsneg_feedback_z 0.220286   0.383386   0.575 0.565639
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00927
## lmer.REML = 12349 Scale est. = 17.93      n = 2022

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.072016982 0.02353526
## XlOFC_posvsneg_feedback_z -0.027977210 0.06045240
## Xrace.ethnicity.5levelBlack 0.073335943 0.05407142
## Xrace.ethnicity.5levelMixed 0.179947249 0.05443009
## Xrace.ethnicity.5levelOther 0.108667074 0.03899162
## Xrace.ethnicity.5levelWhite 0.183412227 0.07161702
## Xdemo_race_hispanic1      -0.000295504 0.02569613
## Xinterview_age      0.009221725 0.02266674
## XPDS_score:lOFC_posvsneg_feedback_z 0.034719661 0.06042611
```

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

##### Female participants

```
##
```

```

## 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

##               stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## XPDS_score         0.09205752 0.02388247
## XmOFC_posvsneg_feedback_z -0.07972625 0.05535673
## Xrace.ethnicity.5levelBlack  0.03274690 0.05431612
## Xrace.ethnicity.5levelMixed  0.13531019 0.05393443
## Xrace.ethnicity.5levelOther  0.09372436 0.04028628
## Xrace.ethnicity.5levelWhite  0.11104141 0.07119834
## Xdemo_race_hispanic1      0.03439118 0.02589090
## Xinterview_age        -0.03189948 0.02248257
## XPDS_score:mOFC_posvsneg_feedback_z  0.06357237 0.05578438

```

## Male participants

```

##
## 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)      1.034110    1.995537   0.518  0.604368
## PDS_score         0.710784    0.231505   3.070  0.002167 **
## mOFC_posvsneg_feedback_z -0.063667    0.507003  -0.126  0.900081

```

```
## race.ethnicity.5levelBlack      1.166348    0.864096    1.350 0.177235
## race.ethnicity.5levelMixed      2.840113    0.853678    3.327 0.000894 ***
## race.ethnicity.5levelOther      2.804023    0.982024    2.855 0.004343 **
## race.ethnicity.5levelWhite      2.063742    0.802717    2.571 0.010213 *
## demo_race_hispanic1            -0.021981    0.332877   -0.066 0.947358
## interview_age                   0.005773    0.015597    0.370 0.711295
## PDS_score:m0FC_posvsneg_feedback_z 0.249767    0.350278    0.713 0.475896
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0109
## lmer.REML = 12337  Scale est. = 18.041    n = 2020

##                                stdcoef      stdse
## X(Intercept)                   0.000000000 0.000000000
## XPDS_score                     0.072171105 0.02350639
## Xm0FC_posvsneg_feedback_z     -0.007832675 0.06237454
## Xrace.ethnicity.5levelBlack    0.073046046 0.05411659
## Xrace.ethnicity.5levelMixed    0.180997361 0.05440397
## Xrace.ethnicity.5levelOther    0.111577504 0.03907663
## Xrace.ethnicity.5levelWhite    0.184144957 0.07162534
## Xdemo_race_hispanic1          -0.001694137 0.02565583
## Xinterview_age                 0.008376781 0.02262955
## XPDS_score:m0FC_posvsneg_feedback_z 0.044479181 0.06237857
```

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

##### Female participants

```
##
## 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
```

```
##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.209729583 0.07349406
## Xbisbas_ss_basm_rr 0.048498991 0.04703765
## Xrace.ethnicity.5levelBlack 0.013141938 0.05170153
## Xrace.ethnicity.5levelMixed 0.113552923 0.04786484
## Xrace.ethnicity.5levelOther 0.096398587 0.03455859
## Xrace.ethnicity.5levelWhite 0.116005473 0.06404984
## Xdemo_race_hispanic1 0.011826552 0.02275701
## Xinterview_age   -0.006689046 0.01981553
## XPDS_score:bisbas_ss_basm_rr -0.156103576 0.08658904
```

## Male participants

```
##
## 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)    4.7054447  2.0835699   2.258  0.02400 *
## PDS_score      -0.8591754  0.7894309  -1.088  0.27653
## bisbas_ss_basm_rr -0.2496975  0.1188097  -2.102  0.03567 *
## race.ethnicity.5levelBlack  1.2625240  0.7536578   1.675  0.09401 .
## race.ethnicity.5levelMixed  1.9860475  0.7540626   2.634  0.00849 **
## race.ethnicity.5levelOther  1.8136662  0.8608544   2.107  0.03522 *
## race.ethnicity.5levelWhite  1.4414378  0.7070615   2.039  0.04158 *
## demo_race_hispanic1    0.2551682  0.3009364   0.848  0.39656
## interview_age   -0.0006594  0.0140091  -0.047  0.96246
## PDS_score:bisbas_ss_basm_rr  0.1846776  0.0826003   2.236  0.02544 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00837
## lmer.REML = 17688 Scale est. = 16.104 n = 2842
```

```
##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      -0.0853246230 0.07839830
## Xbisbas_ss_basm_rr -0.1046016374 0.04977100
## Xrace.ethnicity.5levelBlack  0.0810062817 0.04835632
## Xrace.ethnicity.5levelMixed  0.1179676691 0.04478997
## Xrace.ethnicity.5levelOther  0.0709013952 0.03365326
## Xrace.ethnicity.5levelWhite  0.1239926276 0.06082150
```

```
## Xdemo_race_hispanic1      0.0184226382 0.02172701
## Xinterview_age            -0.0008981279 0.01908140
## XPDS_score:bisbas_ss_basm_rr 0.2074705366 0.09279489
```

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

### Female participants

```
##
## 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)    5.501431   1.992806   2.761  0.00582 **
## PDS_score       0.641948   0.172915   3.713  0.00021 ***
## rt_diff_large_neutral_z 0.154591   0.311300   0.497  0.61952
## race.ethnicity.5levelBlack 0.560716   0.845384   0.663  0.50723
## race.ethnicity.5levelMixed 2.155255   0.833294   2.586  0.00976 **
## race.ethnicity.5levelOther 2.598824   0.947143   2.744  0.00612 **
## race.ethnicity.5levelWhite 1.320738   0.781113   1.691  0.09101 .
## demo_race_hispanic1 0.456433   0.341115   1.338  0.18102
## interview_age   -0.026474   0.015690  -1.687  0.09170 .
## PDS_score:rt_diff_large_neutral_z -0.008308   0.171353  -0.048  0.96133
## ---
## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.085432620 0.02301209
## Xrt_diff_large_neutral_z 0.026457754 0.05327813
## Xrace.ethnicity.5levelBlack 0.035027385 0.05281032
## Xrace.ethnicity.5levelMixed 0.131975792 0.05102624
## Xrace.ethnicity.5levelOther 0.104261170 0.03799806
## Xrace.ethnicity.5levelWhite 0.114828644 0.06791216
## Xdemo_race_hispanic1 0.033597952 0.02510939
## Xinterview_age   -0.036666351 0.02173111
## XPDS_score:rt_diff_large_neutral_z -0.002595203 0.05352500
```

### Male participants

```
##
## 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)    1.468491   1.936596   0.758  0.44836
## PDS_score       0.622357   0.221670   2.808  0.00503 **
## rt_diff_large_neutral_z
##               0.615672   0.346277   1.778  0.07554 .
## race.ethnicity.5levelBlack
##               0.747830   0.844881   0.885  0.37618
## race.ethnicity.5levelMixed
##               2.159276   0.837486   2.578  0.00999 **
## race.ethnicity.5levelOther
##               1.993475   0.961808   2.073  0.03832 *
## race.ethnicity.5levelWhite
##               1.472352   0.790394   1.863  0.06262 .
## demo_race_hispanic1
##               0.097591   0.322937   0.302  0.76253
## interview_age   0.008204   0.015067   0.544  0.58618
## PDS_score:rt_diff_large_neutral_z
##               -0.391427   0.240096  -1.630  0.10318
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00718
## lmer.REML = 13840 Scale est. = 17.748    n = 2251

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.062424145 0.02223409
## Xrt_diff_large_neutral_z
##               0.102340818 0.05756040
## Xrace.ethnicity.5levelBlack
##               0.047305062 0.05344412
## Xrace.ethnicity.5levelMixed
##               0.136588098 0.05297635
## Xrace.ethnicity.5levelOther
##               0.078885051 0.03806030
## Xrace.ethnicity.5levelWhite
##               0.130288521 0.06994200
## Xdemo_race_hispanic1
##               0.007341529 0.02429389
## Xinterview_age   0.011689322 0.02146953
## XPDS_score:rt_diff_large_neutral_z
##               -0.093733703 0.05749496

```

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

##### Female participants

```

##
## 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)    5.41837   1.99084   2.722 0.006548 **

```

```
## PDS_score          0.62952      0.17249      3.650 0.000269 ***
## rt_diff_large_small_z -0.54788      0.29956     -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 0.25827      0.16476      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

##              stdcoef      stdse
## X(Intercept)      0.00000000 0.00000000
## XPDS_score        0.08377894 0.02295527
## Xrt_diff_large_small_z -0.09440033 0.05161478
## Xrace.ethnicity.5levelBlack 0.03528668 0.05270563
## Xrace.ethnicity.5levelMixed 0.13118268 0.05097799
## Xrace.ethnicity.5levelOther 0.10258523 0.03798156
## Xrace.ethnicity.5levelWhite 0.11301707 0.06783728
## Xdemo_race_hispanic1      0.03384796 0.02509224
## Xinterview_age      -0.03516595 0.02169951
## XPDS_score:rt_diff_large_small_z 0.08112913 0.05175544
```

## Male participants

```
##
## 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)      1.495433   1.937391   0.772  0.44027
## PDS_score        0.625956   0.221517   2.826  0.00476 **
## rt_diff_large_small_z 0.112502   0.346367   0.325  0.74536
## race.ethnicity.5levelBlack 0.702795   0.844996   0.832  0.40566
## race.ethnicity.5levelMixed 2.106456   0.837600   2.515  0.01198 *
## race.ethnicity.5levelOther 1.868262   0.960621   1.945  0.05192 .
## race.ethnicity.5levelWhite 1.410928   0.790353   1.785  0.07437 .
## demo_race_hispanic1      0.094464   0.323247   0.292  0.77013
## interview_age        0.008503   0.015075   0.564  0.57278
## PDS_score:rt_diff_large_small_z -0.142787   0.241824  -0.590  0.55494
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## R-sq.(adj) = 0.00581
## lmer.REML = 13842 Scale est. = 17.609 n = 2251

##               stdcoef      stdse
## X(Intercept)  0.000000000 0.00000000
## XPDS_score    0.062785201 0.02221882
## Xrt_diff_large_small_z 0.018914894 0.05823430
## Xrace.ethnicity.5levelBlack 0.044456297 0.05345140
## Xrace.ethnicity.5levelMixed 0.133246850 0.05298360
## Xrace.ethnicity.5levelOther 0.073930194 0.03801336
## Xrace.ethnicity.5levelWhite 0.124853059 0.06993836
## Xdemo_race_hispanic1 0.007106301 0.02431718
## Xinterview_age 0.012115652 0.02148020
## XPDS_score:rt_diff_large_small_z -0.034405634 0.05826948
```

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

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      accumbens_rvs_n_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_rvs_n_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_rvs_n_ant_z -0.006376   0.011134  -0.573 0.566914
##
## (Intercept)          *
## PDS_score             ***
## hormone_scr_ert_mean
## accumbens_rvs_n_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

##               stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## XPDS_score        0.088048832 0.02529474
## Xhormone_scr_ert_mean 0.008367511 0.02422393
## Xaccumbens_rvsnt_ant_z 0.022981740 0.05274494
## Xrace.ethnicity.5levelBlack 0.013159110 0.05374735
## Xrace.ethnicity.5levelMixed 0.135545710 0.05480091
## Xrace.ethnicity.5levelOther 0.091880743 0.04101443
## Xrace.ethnicity.5levelWhite 0.115032704 0.07148108
## Xdemo_race_hispanic1 0.026450768 0.02669426
## Xinterview_age    -0.025633451 0.02348207
## Xhormone_scr_ert_mean:accumbens_rvsnt_ant_z -0.030085404 0.05253210
```

## Male participants

```
##
## 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)      0.826356   2.106340   0.392  0.69487
## PDS_score         0.807336   0.248609   3.247  0.00119
## hormone_scr_ert_mean -0.001599   0.008291  -0.193  0.84712
## accumbens_rvsnt_ant_z -0.226384   0.363241  -0.623  0.53321
## race.ethnicity.5levelBlack 1.015589   0.917880   1.106  0.26868
## race.ethnicity.5levelMixed 2.778456   0.902439   3.079  0.00211
## race.ethnicity.5levelOther 2.730933   1.035962   2.636  0.00846
## race.ethnicity.5levelWhite 2.072912   0.848688   2.442  0.01468
## demo_race_hispanic1  0.093889   0.347187   0.270  0.78686
## interview_age       0.007195   0.016674   0.431  0.66618
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z 0.003889   0.010802   0.360  0.71890
##
## (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_rvs_n_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00997
## lmer.REML = 11479  Scale est. = 18.675    n = 1866

##                                stdcoef      stdse
## X(Intercept)                   0.000000000 0.000000000
## XPDS_score                     0.080086034 0.02466148
## Xhormone_scr_ert_mean          -0.004656018 0.02414640
## Xaccumbens_rvs_n_ant_z        -0.031496666 0.05053762
## Xrace.ethnicity.5levelBlack    0.061964362 0.05600285
## Xrace.ethnicity.5levelMixed    0.174432269 0.05665535
## Xrace.ethnicity.5levelOther    0.107339563 0.04071859
## Xrace.ethnicity.5levelWhite    0.181614492 0.07435632
## Xdemo_race_hispanic1          0.007153489 0.02645243
## Xinterview_age                 0.010256443 0.02377085
## Xhormone_scr_ert_mean:accumbens_rvs_n_ant_z 0.018217382 0.05060633
```

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

##### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   caudate_rvs_n_ant_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   4.5348882  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_rvs_n_ant_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_rvs_n_ant_z 0.0001989  0.0087533   0.023 0.981875
##
```

```

## (Intercept) *
## PDS_score ***
## hormone_scr_ert_mean
## caudate_rvsnt_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed *
## race.ethnicity.5levelOther *
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:caudate_rvsnt_ant_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

##                stdcoef      stdse
## X(Intercept)    0.0000000000 0.00000000
## XPDS_score      0.0904617420 0.02530311
## Xhormone_scr_ert_mean 0.0085822122 0.02426639
## Xcaudate_rvsnt_ant_z -0.0005902608 0.05453016
## Xrace.ethnicity.5levelBlack 0.0156609707 0.05349228
## Xrace.ethnicity.5levelMixed 0.1348256129 0.05497478
## Xrace.ethnicity.5levelOther 0.0916153870 0.04110496
## Xrace.ethnicity.5levelWhite 0.1157573234 0.07150432
## Xdemo_race_hispanic1 0.0255479878 0.02663958
## Xinterview_age -0.0268625946 0.02352540
## Xhormone_scr_ert_mean:caudate_rvsnt_ant_z 0.0012411632 0.05462655

```

## Male participants

```

##
## 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)    1.090318   2.116933   0.515 0.606582
## PDS_score      0.820521   0.248605   3.300 0.000983
## hormone_scr_ert_mean -0.001400   0.008342  -0.168 0.866760
## caudate_rvsnt_ant_z  0.207941   0.288077   0.722 0.470495
## race.ethnicity.5levelBlack 0.905254   0.938982   0.964 0.335132
## race.ethnicity.5levelMixed 2.714709   0.924768   2.936 0.003371
## race.ethnicity.5levelOther 2.652355   1.053709   2.517 0.011914
## race.ethnicity.5levelWhite 1.977938   0.872654   2.267 0.023531
## demo_race_hispanic1  0.094266   0.349284   0.270 0.787280

```

```

## interview_age                0.005727    0.016720    0.343 0.732003
## hormone_scr_ert_mean:caudate_rvsnt_z -0.009114    0.008086   -1.127 0.259871
##
## (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 = 11473  Scale est. = 18.944    n = 1864

##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.000000000
## XPDS_score                    0.081249074 0.02461724
## Xhormone_scr_ert_mean         -0.004063508 0.02421654
## Xcaudate_rvsnt_z              0.037011233 0.05127471
## Xrace.ethnicity.5levelBlack    0.055283898 0.05734370
## Xrace.ethnicity.5levelMixed    0.169939493 0.05789003
## Xrace.ethnicity.5levelOther    0.104735783 0.04160869
## Xrace.ethnicity.5levelWhite    0.173000734 0.07632682
## Xdemo_race_hispanic1          0.007145795 0.02647729
## Xinterview_age                0.008150815 0.02379699
## Xhormone_scr_ert_mean:caudate_rvsnt_z -0.057746001 0.05123680

```

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

Female participants

```

##
## 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_rvs_n_ant_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_rvs_n_ant_z  0.004550    0.008692    0.523  0.600715
##
## (Intercept)                  *
## PDS_score                     ***
## hormone_scr_ert_mean
## putamen_rvs_n_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed    *
## race.ethnicity.5levelOther    *
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:putamen_rvs_n_ant_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

##                stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.090800903 0.02537719
## Xhormone_scr_ert_mean 0.005262216 0.02426301
## Xputamen_rvs_n_ant_z -0.031273105 0.05331090
## Xrace.ethnicity.5levelBlack 0.019075586 0.05354945
## Xrace.ethnicity.5levelMixed 0.137414357 0.05487842
## Xrace.ethnicity.5levelOther 0.092518827 0.04103862
## Xrace.ethnicity.5levelWhite 0.114607647 0.07143754
## Xdemo_race_hispanic1 0.027011425 0.02669677
## Xinterview_age    -0.024416110 0.02355743
## Xhormone_scr_ert_mean:putamen_rvs_n_ant_z 0.027821247 0.05314857

```

## Male participants

```

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

```



```

## (Intercept)                0.950507    2.111716    0.450 0.652683
## PDS_score                   0.835710    0.249503    3.349 0.000826
## hormone_scr_ert_mean       -0.001234    0.008330   -0.148 0.882222
## putamen_rvsnt_ant_z        0.358346    0.285470    1.255 0.209533
## race.ethnicity.5levelBlack  0.938358    0.937376    1.001 0.316935
## race.ethnicity.5levelMixed  2.714538    0.920851    2.948 0.003240
## race.ethnicity.5levelOther  2.456016    1.055552    2.327 0.020085
## race.ethnicity.5levelWhite  1.963689    0.870617    2.256 0.024217
## demo_race_hispanic1        0.055634    0.348600    0.160 0.873220
## interview_age              0.006910    0.016685    0.414 0.678820
## hormone_scr_ert_mean:putamen_rvsnt_ant_z -0.014910    0.007825   -1.906 0.056869
##
## (Intercept)
## PDS_score                    ***
## hormone_scr_ert_mean
## putamen_rvsnt_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed    **
## race.ethnicity.5levelOther    *
## race.ethnicity.5levelWhite    *
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:putamen_rvsnt_ant_z .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0113
## lmer.REML = 11461  Scale est. = 18.242    n = 1864

##                stdcoef      stdse
## X(Intercept)    0.000000000 0.000000000
## XPDS_score      0.082371181 0.02459214
## Xhormone_scr_ert_mean -0.003584990 0.02419450
## Xputamen_rvsnt_ant_z 0.063156589 0.05031251
## Xrace.ethnicity.5levelBlack 0.057199532 0.05713969
## Xrace.ethnicity.5levelMixed 0.171840499 0.05829332
## Xrace.ethnicity.5levelOther 0.096091091 0.04129823
## Xrace.ethnicity.5levelWhite 0.172199089 0.07634584
## Xdemo_race_hispanic1 0.004221928 0.02645460
## Xinterview_age    0.009853074 0.02379169
## Xhormone_scr_ert_mean:putamen_rvsnt_ant_z -0.095896161 0.05032583

```

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

Female participants

```

##
## 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

##
##               stdcoef      stdse
## X(Intercept)      0.000000000 0.00000000
## XPDS_score        0.090167889 0.02529740
## Xhormone_scr_ert_mean 0.006997497 0.02424821
## Xaccumbens_posvsneg_feedback_z 0.037588859 0.05465681
## Xrace.ethnicity.5levelBlack 0.017149749 0.05389191
## Xrace.ethnicity.5levelMixed 0.132108077 0.05493854
## Xrace.ethnicity.5levelOther 0.095615174 0.04128145
## Xrace.ethnicity.5levelWhite 0.118997652 0.07166940
## Xdemo_race_hispanic1 0.020239798 0.02669737
## Xinterview_age    -0.022931083 0.02349276
## Xhormone_scr_ert_mean:accumbens_posvsneg_feedback_z -0.046304621 0.05464837

```

## Male participants

```

##
## 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)                       0.658559    2.091251   0.315
## PDS_score                         0.769057    0.246289   3.123
## hormone_scr_ert_mean              -0.002729    0.008376  -0.326
## accumbens_posvsneg_feedback_z     0.304347    0.375976   0.809
## race.ethnicity.5levelBlack        1.124960    0.909945   1.236
## race.ethnicity.5levelMixed        2.837777    0.892904   3.178
## race.ethnicity.5levelOther        2.905780    1.025407   2.834
## race.ethnicity.5levelWhite        2.089149    0.840017   2.487
## demo_race_hispanic1              0.063400    0.345254   0.184
## interview_age                     0.008688    0.016568   0.524
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z 0.001418    0.010581   0.134
##
##                                     Pr(>|t|)
## (Intercept)                       0.75286
## PDS_score                         0.00182 **
## hormone_scr_ert_mean              0.74457
## accumbens_posvsneg_feedback_z     0.41834
## race.ethnicity.5levelBlack        0.21651
## race.ethnicity.5levelMixed        0.00151 **
## race.ethnicity.5levelOther        0.00465 **
## race.ethnicity.5levelWhite        0.01297 *
## demo_race_hispanic1              0.85432
## interview_age                     0.60006
## hormone_scr_ert_mean:accumbens_posvsneg_feedback_z 0.89337
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0114
## lmer.REML = 11419 Scale est. = 19.181    n = 1862
##
##                                     stdcoef      stdse
## X(Intercept)                       0.000000000 0.000000000
## XPDS_score                         0.076885588 0.02462248
## Xhormone_scr_ert_mean              -0.007995204 0.02453590
## Xaccumbens_posvsneg_feedback_z     0.041184918 0.05087796
## Xrace.ethnicity.5levelBlack        0.068884609 0.05571865
## Xrace.ethnicity.5levelMixed        0.179539583 0.05649196
## Xrace.ethnicity.5levelOther        0.115321880 0.04069538
## Xrace.ethnicity.5levelWhite        0.184381166 0.07413704
## Xdemo_race_hispanic1              0.004856984 0.02644958
## Xinterview_age                     0.012474363 0.02378765
## Xhormone_scr_ert_mean:accumbens_posvsneg_feedback_z 0.006843802 0.05105107

```

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

Female participants

```
##
## 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

##
```

	stdcoef	stdse
X(Intercept)	0.000000e+00	0.00000000
XPDS_score	9.263388e-02	0.02534069
Xhormone_scr_ert_mean	7.251566e-03	0.02430729
Xcaudate_posvsneg_feedback_z	-3.193048e-02	0.05218801
Xrace.ethnicity.5levelBlack	1.758754e-02	0.05363161
Xrace.ethnicity.5levelMixed	1.319344e-01	0.05506927
Xrace.ethnicity.5levelOther	8.696694e-02	0.04117999

```
## Xrace.ethnicity.5levelWhite 1.122973e-01 0.07156246
## Xdemo_race_hispanic1 2.548609e-02 0.02674784
## Xinterview_age -2.709446e-02 0.02357562
## Xhormone_scr_ert_mean:caudate_posvsneg_feedback_z -4.981198e-05 0.05235506
```

## Male participants

```
##
## 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)  1.3883336  2.1190745   0.655
## PDS_score    0.8436839  0.2489426   3.389
## hormone_scr_ert_mean -0.0004785  0.0083682  -0.057
## caudate_posvsneg_feedback_z 0.0385882  0.3254904   0.119
## race.ethnicity.5levelBlack 1.0010979  0.9272429   1.080
## race.ethnicity.5levelMixed 2.7672791  0.9117289   3.035
## race.ethnicity.5levelOther 2.7627825  1.0407302   2.655
## race.ethnicity.5levelWhite 2.0558581  0.8586835   2.394
## demo_race_hispanic1 0.1363458  0.3485672   0.391
## interview_age 0.0018276  0.0167146   0.109
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.0037076  0.0092531   0.401
##               Pr(>|t|)
## (Intercept)  0.512446
## PDS_score    0.000716 ***
## hormone_scr_ert_mean 0.954412
## caudate_posvsneg_feedback_z 0.905642
## race.ethnicity.5levelBlack 0.280439
## race.ethnicity.5levelMixed 0.002437 **
## race.ethnicity.5levelOther 0.008007 **
## race.ethnicity.5levelWhite 0.016756 *
## demo_race_hispanic1 0.695723
## interview_age 0.912943
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.688697
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0104
## lmer.REML = 11469 Scale est. = 18.894    n = 1864

##               stdcoef      stdse
## X(Intercept)  0.00000000 0.00000000
## XPDS_score    0.083449931 0.02462325
## Xhormone_scr_ert_mean -0.001390307 0.02431675
## Xcaudate_posvsneg_feedback_z 0.006366573 0.05370187
```

```
## Xrace.ethnicity.5levelBlack          0.061180869 0.05666731
## Xrace.ethnicity.5levelMixed          0.173354353 0.05711465
## Xrace.ethnicity.5levelOther          0.109174442 0.04112562
## Xrace.ethnicity.5levelWhite          0.180030947 0.07519468
## Xdemo_race_hispanic1                 0.010363679 0.02649469
## Xinterview_age                       0.002600489 0.02378302
## Xhormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.021559629 0.05380679
```

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

##### Female participants

```
##
## 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
```

```
##
##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.000000000
## XPDS_score                    0.089424969 0.02534449
## Xhormone_scr_ert_mean         0.008533937 0.02433147
## Xputamen_posvsneg_feedback_z -0.008689526 0.05507630
## Xrace.ethnicity.5levelBlack   0.021092081 0.05367831
## Xrace.ethnicity.5levelMixed   0.134877786 0.05516076
## Xrace.ethnicity.5levelOther   0.089750821 0.04105219
## Xrace.ethnicity.5levelWhite   0.115262984 0.07160866
## Xdemo_race_hispanic1         0.026804630 0.02671849
## Xinterview_age               -0.024123053 0.02353253
## Xhormone_scr_ert_mean:putamen_posvsneg_feedback_z -0.018618912 0.05510494
```

## Male participants

```
##
## 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)                  0.9678945  2.1150864   0.458
## PDS_score                    0.8206911  0.2491162   3.294
## hormone_scr_ert_mean         0.0001559  0.0083903   0.019
## putamen_posvsneg_feedback_z  0.3279395  0.3259022   1.006
## race.ethnicity.5levelBlack   1.0351830  0.9199736   1.125
## race.ethnicity.5levelMixed   2.8187987  0.9041222   3.118
## race.ethnicity.5levelOther   2.8285173  1.0349923   2.733
## race.ethnicity.5levelWhite   2.1215584  0.8509597   2.493
## demo_race_hispanic1         0.0681918  0.3505186   0.195
## interview_age                0.0050743  0.0167195   0.303
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -0.0049790  0.0091813  -0.542
##                                Pr(>|t|)
## (Intercept)                  0.64728
## PDS_score                    0.00100 **
## hormone_scr_ert_mean         0.98517
## putamen_posvsneg_feedback_z  0.31443
## race.ethnicity.5levelBlack   0.26064
## race.ethnicity.5levelMixed   0.00185 **
## race.ethnicity.5levelOther   0.00634 **
## race.ethnicity.5levelWhite   0.01275 *
## demo_race_hispanic1         0.84577
## interview_age                0.76155
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z  0.58768
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```
## R-sq.(adj) = 0.0102
## lmer.REML = 11517 Scale est. = 19.045 n = 1870
```

```
##
##                                stdcoef      stdse
## X(Intercept)                   0.0000000000 0.00000000
## XPDS_score                     0.0810367444 0.02459825
## Xhormone_scr_ert_mean           0.0004519792 0.02431881
## Xputamen_posvsneg_feedback_z    0.0536290875 0.05329591
## Xrace.ethnicity.5levelBlack      0.0629716317 0.05596328
## Xrace.ethnicity.5levelMixed      0.1760914006 0.05648085
## Xrace.ethnicity.5levelOther      0.1118613343 0.04093156
## Xrace.ethnicity.5levelWhite      0.1852841829 0.07431771
## Xdemo_race_hispanic1             0.0051603085 0.02652497
## Xinterview_age                  0.0072033788 0.02373469
## Xhormone_scr_ert_mean:putamen_posvsneg_feedback_z -0.0289168505 0.05332263
```

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

##### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   lOFC_rvsnt_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_rvsnt_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_rvsnt_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

##                                stdcoef      stdse
## X(Intercept)                   0.0000000000 0.00000000
## XPDS_score                     0.087218772 0.02541257
```



```
## Xhormone_scr_ert_mean          0.009225083 0.02438763
## XlOFC_rvs_n_ant_z             0.034944355 0.05194040
## Xrace.ethnicity.5levelBlack   0.013630564 0.05427961
## Xrace.ethnicity.5levelMixed   0.132116587 0.05544004
## Xrace.ethnicity.5levelOther   0.090248343 0.04170778
## Xrace.ethnicity.5levelWhite   0.110969448 0.07239970
## Xdemo_race_hispanic1         0.026757077 0.02680994
## Xinterview_age                -0.024258921 0.02368814
## Xhormone_scr_ert_mean:lOFC_rvs_n_ant_z -0.028954334 0.05191328
```

## Male participants

```
##
## 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)    0.150908   2.087223   0.072  0.94237
## PDS_score       0.735069   0.248610   2.957  0.00315 **
## hormone_scr_ert_mean -0.003581 0.008285  -0.432  0.66566
## lOFC_rvs_n_ant_z  0.318482   0.425928   0.748  0.45472
## race.ethnicity.5levelBlack  0.995449   0.908689   1.095  0.27345
## race.ethnicity.5levelMixed  2.714104   0.892622   3.041  0.00239 **
## race.ethnicity.5levelOther  2.660468   1.024339   2.597  0.00947 **
## race.ethnicity.5levelWhite  1.971262   0.838789   2.350  0.01887 *
## demo_race_hispanic1 -0.018859   0.345314  -0.055  0.95645
## interview_age     0.014731   0.016549   0.890  0.37349
## hormone_scr_ert_mean:lOFC_rvs_n_ant_z -0.011844 0.012319  -0.962  0.33642
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0088
## lmer.REML = 11420 Scale est. = 18.159    n = 1863

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.073113645 0.02472805
## Xhormone_scr_ert_mean -0.010454089 0.02418883
## XlOFC_rvs_n_ant_z  0.037501635 0.05015365
## Xrace.ethnicity.5levelBlack  0.061069392 0.05574683
## Xrace.ethnicity.5levelMixed  0.171722959 0.05647675
## Xrace.ethnicity.5levelOther  0.105783195 0.04072886
## Xrace.ethnicity.5levelWhite  0.174235445 0.07413867
## Xdemo_race_hispanic1 -0.001449026 0.02653155
## Xinterview_age    0.021210017 0.02382701
## Xhormone_scr_ert_mean:lOFC_rvs_n_ant_z -0.048290370 0.05022375
```

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

Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   mOFC_rvs_n_ant_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
## mOFC_rvs_n_ant_z    0.063317   0.437193   0.145 0.884864
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed
## race.ethnicity.5levelOther
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age      -0.016049   0.016989  -0.945 0.344951
## hormone_scr_ert_mean:mOFC_rvs_n_ant_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

##               stdcoef      stdse
## X(Intercept)    0.00000000 0.00000000
## XPDS_score      0.089377321 0.02531284
## Xhormone_scr_ert_mean
## XmOFC_rvs_n_ant_z    0.007704058 0.02424402
## Xrace.ethnicity.5levelBlack
## Xrace.ethnicity.5levelMixed
## Xrace.ethnicity.5levelOther
## Xrace.ethnicity.5levelWhite
## Xdemo_race_hispanic1
## Xinterview_age    -0.022263668 0.02356767
## Xhormone_scr_ert_mean:mOFC_rvs_n_ant_z  0.014123809 0.05352261
```

Male participants

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

```

## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      mOFC_rvs_n_ant_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3832360   2.0976904   0.183  0.85506
## PDS_score         0.7451921   0.2484437   2.999  0.00274 **
## hormone_scr_ert_mean -0.0048427  0.0082810  -0.585  0.55876
## mOFC_rvs_n_ant_z    0.2130617  0.3870717   0.550  0.58208
## race.ethnicity.5levelBlack  1.0194439  0.9127620   1.117  0.26419
## race.ethnicity.5levelMixed  2.6588881  0.8961882   2.967  0.00305 **
## race.ethnicity.5levelOther  2.6485499  1.0260213   2.581  0.00992 **
## race.ethnicity.5levelWhite  1.9814512  0.8424593   2.352  0.01878 *
## demo_race_hispanic1    0.0445607  0.3461643   0.129  0.89759
## interview_age        0.0129518  0.0166157   0.779  0.43579
## hormone_scr_ert_mean:mOFC_rvs_n_ant_z -0.0001119  0.0109075  -0.010  0.99182
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0096
## lmer.REML = 11397  Scale est. = 18.344    n = 1857

##
##              stdcoef      stdse
## X(Intercept)      0.0000000000 0.00000000
## XPDS_score        0.0741649416 0.02472626
## Xhormone_scr_ert_mean -0.0141767364 0.02424212
## XmOFC_rvs_n_ant_z    0.0273278189 0.04964676
## Xrace.ethnicity.5levelBlack  0.0621167897 0.05561644
## Xrace.ethnicity.5levelMixed  0.1677608905 0.05654443
## Xrace.ethnicity.5levelOther  0.1056256681 0.04091831
## Xrace.ethnicity.5levelWhite  0.1744784954 0.07418353
## Xdemo_race_hispanic1    0.0034169889 0.02654445
## Xinterview_age      0.0185909553 0.02385014
## Xhormone_scr_ert_mean:mOFC_rvs_n_ant_z -0.0005086038 0.04957859

```

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

Female participants

```

##
## 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

##                                stdcoef      stdse
## X(Intercept)                   0.000000000 0.00000000
## XPDS_score                     0.089530985 0.02533420
## Xhormone_scr_ert_mean          0.003392483 0.02429891
## XlOFC_posvsneg_feedback_z      0.051315582 0.05290828
## Xrace.ethnicity.5levelBlack    0.017930105 0.05372656
## Xrace.ethnicity.5levelMixed    0.134618193 0.05475990
## Xrace.ethnicity.5levelOther    0.102781970 0.04082687
## Xrace.ethnicity.5levelWhite    0.118852302 0.07135454
## Xdemo_race_hispanic1          0.017760349 0.02665016
## Xinterview_age                 -0.024044745 0.02355472
## Xhormone_scr_ert_mean:lOFC_posvsneg_feedback_z -0.069808143 0.05300648

```

## Male participants

```

##
## 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)      0.714685   2.088512   0.342
## PDS_score         0.783974   0.246780   3.177
## hormone_scr_ert_mean -0.003902   0.008305  -0.470
## lOFC_posvsneg_feedback_z 0.077362   0.470889   0.164
## race.ethnicity.5levelBlack 1.077394   0.910723   1.183
## race.ethnicity.5levelMixed 2.805075   0.893849   3.138
## race.ethnicity.5levelOther 2.628287   1.029908   2.552
## race.ethnicity.5levelWhite 2.036011   0.840929   2.421
## demo_race_hispanic1 0.054593   0.346160   0.158
## interview_age      0.009083   0.016537   0.549
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z 0.001431   0.013061   0.110
##
##              Pr(>|t|)
## (Intercept)      0.73224
## PDS_score         0.00151 **
## hormone_scr_ert_mean 0.63848
## lOFC_posvsneg_feedback_z 0.86952
## race.ethnicity.5levelBlack 0.23696
## race.ethnicity.5levelMixed 0.00173 **
## race.ethnicity.5levelOther 0.01079 *
## race.ethnicity.5levelWhite 0.01557 *
## demo_race_hispanic1 0.87470
## interview_age      0.58291
## hormone_scr_ert_mean:lOFC_posvsneg_feedback_z 0.91278
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00925
## lmer.REML = 11479 Scale est. = 18.264    n = 1871

##
##              stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## XPDS_score         0.078132761 0.02459470
## Xhormone_scr_ert_mean -0.011391423 0.02424239
## XlOFC_posvsneg_feedback_z 0.008171791 0.04974011
## Xrace.ethnicity.5levelBlack 0.065904541 0.05570922
## Xrace.ethnicity.5levelMixed 0.177587855 0.05658912
## Xrace.ethnicity.5levelOther 0.103380522 0.04051021
## Xrace.ethnicity.5levelWhite 0.179456733 0.07412056
## Xdemo_race_hispanic1 0.004179204 0.02649933
## Xinterview_age      0.013060368 0.02377935
## Xhormone_scr_ert_mean:lOFC_posvsneg_feedback_z 0.005459776 0.04983746

```

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

Female participants

```
##
```

```

## 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

##
##              stdcoef      stdse
## X(Intercept)      0.000000000 0.000000000
## XPDS_score         0.090846633 0.02532931
## Xhormone_scr_ert_mean      0.006043042 0.02427799
## XmOFC_posvsneg_feedback_z    0.063887955 0.05508752
## Xrace.ethnicity.5levelBlack    0.016222048 0.05355889
## Xrace.ethnicity.5levelMixed    0.134192510 0.05474567
## Xrace.ethnicity.5levelOther    0.094893539 0.04115858
## Xrace.ethnicity.5levelWhite    0.116250283 0.07137022
## Xdemo_race_hispanic1      0.023515428 0.02667365
## Xinterview_age      -0.024822076 0.02351827
## Xhormone_scr_ert_mean:mOFC_posvsneg_feedback_z -0.082792073 0.05509320

```

## Male participants

```
##
## 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)    0.705120   2.085170   0.338
## PDS_score      0.790538   0.246908   3.202
## hormone_scr_ert_mean -0.003745  0.008306  -0.451
## mOFC_posvsneg_feedback_z 0.539658  0.420064   1.285
## race.ethnicity.5levelBlack 1.043013  0.910260   1.146
## race.ethnicity.5levelMixed 2.833043  0.893757   3.170
## race.ethnicity.5levelOther 2.681549  1.026752   2.612
## race.ethnicity.5levelWhite 2.032990  0.840740   2.418
## demo_race_hispanic1 0.026393  0.345459   0.076
## interview_age 0.009054  0.016506   0.549
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z -0.006810  0.012039  -0.566
##
##              Pr(>|t|)
## (Intercept)    0.73528
## PDS_score      0.00139 **
## hormone_scr_ert_mean 0.65210
## mOFC_posvsneg_feedback_z 0.19906
## race.ethnicity.5levelBlack 0.25201
## race.ethnicity.5levelMixed 0.00155 **
## race.ethnicity.5levelOther 0.00908 **
## race.ethnicity.5levelWhite 0.01570 *
## demo_race_hispanic1 0.93911
## interview_age 0.58341
## hormone_scr_ert_mean:mOFC_posvsneg_feedback_z 0.57169
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0111
## lmer.REML = 11466 Scale est. = 18.396    n = 1869

##
##              stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.078701912 0.02458087
## Xhormone_scr_ert_mean -0.010959530 0.02430454
## XmOFC_posvsneg_feedback_z 0.066266778 0.05158130
## Xrace.ethnicity.5levelBlack 0.063912773 0.05577805
## Xrace.ethnicity.5levelMixed 0.179312006 0.05656865
## Xrace.ethnicity.5levelOther 0.106057369 0.04060885
## Xrace.ethnicity.5levelWhite 0.179287802 0.07414423
## Xdemo_race_hispanic1 0.002019782 0.02643724
## Xinterview_age 0.013009696 0.02371808
```

```
## Xhormone_scr_ert_mean:mOFC_posvsneg_feedback_z -0.029213472 0.05164401
```

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

Female participants

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

##                                stdcoef      stdse
## X(Intercept)                   0.000000000 0.00000000
## XPDS_score                      0.082604510 0.02237807
## Xhormone_scr_ert_mean          -0.028244945 0.07467170
## Xbisbas_ss_basm_rr             -0.035672492 0.04686200
## Xrace.ethnicity.5levelBlack    -0.002670114 0.05096549
```



```
## Xrace.ethnicity.5levelMixed      0.100690667 0.04861502
## Xrace.ethnicity.5levelOther      0.096891536 0.03544029
## Xrace.ethnicity.5levelWhite      0.113429746 0.06417085
## Xdemo_race_hispanic1             0.002007520 0.02347058
## Xinterview_age                   0.004948478 0.02083018
## Xhormone_scr_ert_mean:bisbas_ss_basm_rr 0.031154003 0.08505036
```

## Male participants

```
##
## 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)    2.9701263   2.1007562   1.414   0.1575
## PDS_score       0.9685476   0.2132567   4.542 5.83e-06
## hormone_scr_ert_mean -0.0090263   0.0274874  -0.328   0.7427
## bisbas_ss_basm_rr  -0.0430441   0.1024891  -0.420   0.6745
## race.ethnicity.5levelBlack    1.2247139   0.7869171   1.556   0.1197
## race.ethnicity.5levelMixed    1.9527447   0.7842227   2.490   0.0128
## race.ethnicity.5levelOther    1.6124358   0.9006139   1.790   0.0735
## race.ethnicity.5levelWhite    1.4409351   0.7350396   1.960   0.0501
## demo_race_hispanic1    0.3099222   0.3134454   0.989   0.3229
## interview_age    -0.0028410   0.0148925  -0.191   0.8487
## hormone_scr_ert_mean:bisbas_ss_basm_rr 0.0009282   0.0029410   0.316   0.7523
##
## (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) =  0.00679
## lmer.REML = 16498 Scale est. = 16.685    n = 2636

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.094152622 0.02073071
```

```
## Khormone_scr_ert_mean -0.025137327 0.07654984
## Xbisbas_ss_basm_rr -0.017723946 0.04220121
## Xrace.ethnicity.5levelBlack 0.077043541 0.04950289
## Xrace.ethnicity.5levelMixed 0.115234051 0.04627802
## Xrace.ethnicity.5levelOther 0.061744498 0.03448692
## Xrace.ethnicity.5levelWhite 0.122274376 0.06237374
## Xdemo_race_hispanic1 0.022120273 0.02237174
## Xinterview_age -0.003831664 0.02008576
## Khormone_scr_ert_mean:bisbas_ss_basm_rr 0.027179247 0.08611794
```

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

##### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   rt_diff_large_neutral_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)    4.907584   2.030917   2.416
## PDS_score       0.640866   0.184675   3.470
## hormone_scr_ert_mean 0.002759   0.007808   0.353
## rt_diff_large_neutral_z -0.234714   0.298041  -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 0.010525   0.007542   1.395
##
##               Pr(>|t|)
## (Intercept)    0.015762 *
## PDS_score       0.000531 ***
## hormone_scr_ert_mean 0.723886
## 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

##               stdcoef      stdse
## X(Intercept)    0.000000000 0.00000000
## XPDS_score      0.084660536 0.02439626
## Xhormone_scr_ert_mean 0.008240673 0.02332361
## Xrt_diff_large_neutral_z -0.040099945 0.05091906
## Xrace.ethnicity.5levelBlack 0.014379534 0.05208437
## Xrace.ethnicity.5levelMixed 0.125306101 0.05183418
## Xrace.ethnicity.5levelOther 0.102723097 0.03882115
## Xrace.ethnicity.5levelWhite 0.116282984 0.06802895
## Xdemo_race_hispanic1 0.022839216 0.02580865
## Xinterview_age -0.030444450 0.02270520
## Xhormone_scr_ert_mean:rt_diff_large_neutral_z 0.070724384 0.05068090
```

## Male participants

```
##
## 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)    1.4502677  2.0225524   0.717
## PDS_score      0.7057552  0.2370283   2.978
## hormone_scr_ert_mean -0.0002715  0.0079566  -0.034
## rt_diff_large_neutral_z 0.4957660  0.2919671   1.698
## race.ethnicity.5levelBlack 0.6326718  0.8872742   0.713
## race.ethnicity.5levelMixed 2.1038840  0.8757925   2.402
## race.ethnicity.5levelOther 1.7323746  1.0030273   1.727
## race.ethnicity.5levelWhite 1.3926335  0.8266765   1.685
## demo_race_hispanic1 0.1495244  0.3362208   0.445
## interview_age 0.0083807  0.0159449   0.526
## hormone_scr_ert_mean:rt_diff_large_neutral_z -0.0100928  0.0080219  -1.258
##
##               Pr(>|t|)
## (Intercept)    0.47342
## PDS_score      0.00294 **
## hormone_scr_ert_mean 0.97278
## rt_diff_large_neutral_z 0.08965 .
## race.ethnicity.5levelBlack 0.47589
## race.ethnicity.5levelMixed 0.01638 *
## race.ethnicity.5levelOther 0.08429 .
## race.ethnicity.5levelWhite 0.09221 .
## demo_race_hispanic1 0.65657
## interview_age 0.59922
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.20848
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00659
## lmer.REML = 12919  Scale est. = 18.48      n = 2091

##                                stdcoef      stdse
## X(Intercept)                   0.0000000000 0.00000000
## XPDS_score                     0.0691194630 0.02321381
## Xhormone_scr_ert_mean          -0.0007818428 0.02291272
## Xrt_diff_large_neutral_z       0.0812335089 0.04784013
## Xrace.ethnicity.5levelBlack    0.0392929450 0.05510537
## Xrace.ethnicity.5levelMixed    0.1321383124 0.05500576
## Xrace.ethnicity.5levelOther    0.0679076958 0.03931787
## Xrace.ethnicity.5levelWhite    0.1218099598 0.07230720
## Xdemo_race_hispanic1          0.0111392536 0.02504774
## Xinterview_age                 0.0118296878 0.02250680
## Xhormone_scr_ert_mean:rt_diff_large_neutral_z -0.0601402975 0.04780078
```

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

### Female participants

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   rt_diff_large_small_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value
## (Intercept)                  4.830633   2.029793   2.380
## PDS_score                     0.653073   0.184699   3.536
## hormone_scr_ert_mean          0.001939   0.007810   0.248
## rt_diff_large_small_z        -0.398245   0.292018  -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 0.007626   0.007556   1.009
##                                Pr(>|t|)
## (Intercept)                  0.017412 *
## PDS_score                     0.000416 ***
## hormone_scr_ert_mean          0.803898
## 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

##                                stdcoef      stdse
## X(Intercept)                  0.000000000 0.00000000
## XPDS_score                    0.086273148 0.02439933
## Xhormone_scr_ert_mean         0.005793587 0.02332941
## Xrt_diff_large_small_z       -0.068777079 0.05043159
## Xrace.ethnicity.5levelBlack   0.013479336 0.05208638
## Xrace.ethnicity.5levelMixed   0.124575534 0.05184659
## Xrace.ethnicity.5levelOther   0.101430408 0.03884285
## Xrace.ethnicity.5levelWhite   0.115891113 0.06806462
## Xdemo_race_hispanic1         0.020750382 0.02581176
## Xinterview_age               -0.029245957 0.02268009
## Xhormone_scr_ert_mean:rt_diff_large_small_z 0.050925567 0.05045846
```

## Male participants

```
##
## 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)                  1.5105404  2.0253677   0.746
## PDS_score                    0.6937632  0.2369733   2.928
## hormone_scr_ert_mean        -0.0003462  0.0079643  -0.043
## rt_diff_large_small_z       -0.0119908  0.2898251  -0.041
## race.ethnicity.5levelBlack   0.6102166  0.8879027   0.687
## race.ethnicity.5levelMixed   2.0562980  0.8760914   2.347
## race.ethnicity.5levelOther   1.6642936  1.0033058   1.659
## race.ethnicity.5levelWhite   1.3562003  0.8270570   1.640
## demo_race_hispanic1         0.1405787  0.3363157   0.418
## interview_age                0.0083766  0.0159693   0.525
## hormone_scr_ert_mean:rt_diff_large_small_z -0.0016357  0.0082670  -0.198
##                                Pr(>|t|)
## (Intercept)                  0.45587
## PDS_score                    0.00345 **
## hormone_scr_ert_mean        0.96533
```

```

## rt_diff_large_small_z          0.96700
## race.ethnicity.5levelBlack     0.49200
## race.ethnicity.5levelMixed     0.01901 *
## race.ethnicity.5levelOther     0.09730 .
## race.ethnicity.5levelWhite     0.10120
## demo_race_hispanic1           0.67599
## interview_age                  0.59996
## hormone_scr_ert_mean:rt_diff_large_small_z 0.84317
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00531
## lmer.REML = 12922  Scale est. = 18.52      n = 2091

##                                stdcoef      stdse
## X(Intercept)                  0.0000000000 0.00000000
## XPDS_score                    0.0679450047 0.02320843
## Xhormone_scr_ert_mean         -0.0009970233 0.02293495
## Xrt_diff_large_small_z       -0.0019734573 0.04769957
## Xrace.ethnicity.5levelBlack   0.0378983317 0.05514441
## Xrace.ethnicity.5levelMixed   0.1291495884 0.05502454
## Xrace.ethnicity.5levelOther   0.0652389737 0.03932878
## Xrace.ethnicity.5levelWhite   0.1186232462 0.07234048
## Xdemo_race_hispanic1         0.0104728182 0.02505481
## Xinterview_age                0.0118238679 0.02254134
## Xhormone_scr_ert_mean:rt_diff_large_small_z -0.0094174136 0.04759658

```



## 5— Correlation Matrix —

### Female participants

x1	x2	N	corr	p
bmi	interview_age	2675	0.0777979236	0.00005626170294
PDS_score	interview_age	2701	0.2397245643	0.00000000000000
PDS_score	bmi	2675	0.2883194569	0.00000000000000
hormone_scr_ert_mean_z	interview_age	2514	0.2111922127	0.00000000000000
hormone_scr_ert_mean_z	bmi	2488	0.2011164615	0.00000000000000
hormone_scr_ert_mean_z	PDS_score	2514	0.3194091104	0.00000000000000
bisbas_ss_basm_rr_z	interview_age	2690	-0.0324228218	0.09270914672114
bisbas_ss_basm_rr_z	bmi	2664	0.0518639980	0.00741845859611
bisbas_ss_basm_rr_z	PDS_score	2690	0.0567567189	0.00323263005375
bisbas_ss_basm_rr_z	hormone_scr_ert_mean_z	2504	-0.0149523266	0.45453109921919
rt_diff_large_neutral_z	interview_age	2229	0.0444337653	0.03593351564518
rt_diff_large_neutral_z	bmi	2206	-0.0079826125	0.70786767361752
rt_diff_large_neutral_z	PDS_score	2229	-0.0029053436	0.89095865956824
rt_diff_large_neutral_z	hormone_scr_ert_mean_z	2088	-0.0216332136	0.32313034241508
rt_diff_large_neutral_z	bisbas_ss_basm_rr_z	2220	-0.0006405387	0.97593690877362
rt_diff_large_small_z	interview_age	2229	0.0219796326	0.29961846451327
rt_diff_large_small_z	bmi	2206	-0.0213846091	0.31540780939492
rt_diff_large_small_z	PDS_score	2229	-0.0170095374	0.42216737250534
rt_diff_large_small_z	hormone_scr_ert_mean_z	2087	-0.0043284021	0.84334249311512
rt_diff_large_small_z	bisbas_ss_basm_rr_z	2220	-0.0231864210	0.27483168284004
rt_diff_large_small_z	rt_diff_large_neutral_z	2201	0.4179924701	0.00000000000000
cbcl_scr_syn_internal_r	interview_age	2701	0.0011506908	0.95233479027429
cbcl_scr_syn_internal_r	bmi	2675	0.0643351043	0.00087054703099
cbcl_scr_syn_internal_r	PDS_score	2701	0.0576397227	0.00272912600408
cbcl_scr_syn_internal_r	hormone_scr_ert_mean_z	2514	0.0149428266	0.45391772219594
cbcl_scr_syn_internal_r	bisbas_ss_basm_rr_z	2690	-0.0234766912	0.22351849161129
cbcl_scr_syn_internal_r	rt_diff_large_neutral_z	2229	0.0166852282	0.43107074180790
cbcl_scr_syn_internal_r	rt_diff_large_small_z	2229	-0.0216931306	0.30596364272833
accumbens_rvsn_ant_z	interview_age	2237	0.0114048219	0.58979774095617
accumbens_rvsn_ant_z	bmi	2214	-0.0481381380	0.02350742889809
accumbens_rvsn_ant_z	PDS_score	2237	-0.0022709471	0.91451215925587
accumbens_rvsn_ant_z	hormone_scr_ert_mean_z	2090	-0.0393773431	0.07188968575698
accumbens_rvsn_ant_z	bisbas_ss_basm_rr_z	2229	0.0080008151	0.70577908106748
accumbens_rvsn_ant_z	rt_diff_large_neutral_z	2084	0.0168178792	0.44287695646753
accumbens_rvsn_ant_z	rt_diff_large_small_z	2084	0.0278108340	0.20441541659964
accumbens_rvsn_ant_z	cbcl_scr_syn_internal_r	2237	-0.0011046109	0.95835696200010
caudate_rvsn_ant_z	interview_age	2236	0.0219258951	0.30004325750421
caudate_rvsn_ant_z	bmi	2213	-0.0383512800	0.07126491835157
caudate_rvsn_ant_z	PDS_score	2236	-0.0398572505	0.05951099252948
caudate_rvsn_ant_z	hormone_scr_ert_mean_z	2088	-0.0281662362	0.19825798097841
caudate_rvsn_ant_z	bisbas_ss_basm_rr_z	2228	-0.0060577944	0.77504638139374
caudate_rvsn_ant_z	rt_diff_large_neutral_z	2080	0.0235573317	0.28287521125039
caudate_rvsn_ant_z	rt_diff_large_small_z	2079	0.0303883236	0.16602979724595
caudate_rvsn_ant_z	cbcl_scr_syn_internal_r	2236	-0.0001264905	0.99523032935205
caudate_rvsn_ant_z	accumbens_rvsn_ant_z	2220	0.5792092513	0.00000000000000
putamen_rvsn_ant_z	interview_age	2232	0.0244479138	0.24827723868069
putamen_rvsn_ant_z	bmi	2209	-0.0416045359	0.05056502376294
putamen_rvsn_ant_z	PDS_score	2232	-0.0601145918	0.00449673509563
putamen_rvsn_ant_z	hormone_scr_ert_mean_z	2085	-0.0240042818	0.27326293836512
putamen_rvsn_ant_z	bisbas_ss_basm_rr_z	2224	-0.0131102287	0.53660946224109
putamen_rvsn_ant_z	rt_diff_large_neutral_z	2077	0.0499082533	0.02293157373042
putamen_rvsn_ant_z	rt_diff_large_small_z	2076	0.0429202276	0.05054723967104
putamen_rvsn_ant_z	cbcl_scr_syn_internal_r	2232	-0.0111745491	0.59774112699753



## Male participants

x1	x2	N	corr	p
bmi	interview_age	2901	0.0918986783	0.0000007118236
PDS_score	interview_age	2925	0.1705305535	0.0000000000000
PDS_score	bmi	2901	0.2000023565	0.0000000000000
hormone_scr_ert_mean_z	interview_age	2720	0.1664953530	0.0000000000000
hormone_scr_ert_mean_z	bmi	2697	0.1947537609	0.0000000000000
hormone_scr_ert_mean_z	PDS_score	2720	0.1808497235	0.0000000000000
bisbas_ss_basm_rr_z	interview_age	2908	-0.0112575120	0.5439641273850
bisbas_ss_basm_rr_z	bmi	2884	0.0733765181	0.0000800868703
bisbas_ss_basm_rr_z	PDS_score	2908	0.0549633689	0.0030276683565
bisbas_ss_basm_rr_z	hormone_scr_ert_mean_z	2703	0.0384223603	0.0457810099012
rt_diff_large_neutral_z	interview_age	2317	-0.0125248599	0.5467846238585
rt_diff_large_neutral_z	bmi	2303	-0.0043610748	0.8343127747883
rt_diff_large_neutral_z	PDS_score	2317	-0.0435115439	0.0362332963381
rt_diff_large_neutral_z	hormone_scr_ert_mean_z	2153	-0.0151380839	0.4826505237757
rt_diff_large_neutral_z	bisbas_ss_basm_rr_z	2308	-0.0149974799	0.4714302803412
rt_diff_large_small_z	interview_age	2327	-0.0051579972	0.8036048138750
rt_diff_large_small_z	bmi	2313	0.0073378533	0.7242997169935
rt_diff_large_small_z	PDS_score	2327	-0.0174964117	0.3988816266765
rt_diff_large_small_z	hormone_scr_ert_mean_z	2165	-0.0255918733	0.2339340575978
rt_diff_large_small_z	bisbas_ss_basm_rr_z	2318	-0.0046769321	0.8219376295062
rt_diff_large_small_z	rt_diff_large_neutral_z	2297	0.3765420553	0.0000000000000
cbcl_scr_syn_internal_r	interview_age	2925	0.0046982056	0.7995055144624
cbcl_scr_syn_internal_r	bmi	2901	0.0671462371	0.0002956464790
cbcl_scr_syn_internal_r	PDS_score	2925	0.0737304746	0.0000657082592
cbcl_scr_syn_internal_r	hormone_scr_ert_mean_z	2720	0.0028892677	0.8802779940469
cbcl_scr_syn_internal_r	bisbas_ss_basm_rr_z	2908	0.0063440301	0.7323781880132
cbcl_scr_syn_internal_r	rt_diff_large_neutral_z	2317	0.0030708133	0.8825520064098
cbcl_scr_syn_internal_r	rt_diff_large_small_z	2327	-0.0085058265	0.6817330193853
accumbens_rvsnt_ant_z	interview_age	2334	-0.0222598818	0.2823903366529
accumbens_rvsnt_ant_z	bmi	2319	-0.0241546628	0.2449373017172
accumbens_rvsnt_ant_z	PDS_score	2334	-0.0050367610	0.8078468897401
accumbens_rvsnt_ant_z	hormone_scr_ert_mean_z	2163	-0.0085922236	0.6896102373768
accumbens_rvsnt_ant_z	bisbas_ss_basm_rr_z	2322	-0.0310751306	0.1343993142486
accumbens_rvsnt_ant_z	rt_diff_large_neutral_z	2136	-0.0271739486	0.2093365727565
accumbens_rvsnt_ant_z	rt_diff_large_small_z	2145	-0.0148592024	0.4915610579548
accumbens_rvsnt_ant_z	cbcl_scr_syn_internal_r	2334	-0.0277065434	0.1808689939010
caudate_rvsnt_ant_z	interview_age	2335	0.0125379417	0.5448097811537
caudate_rvsnt_ant_z	bmi	2321	-0.0235785001	0.2561735798566
caudate_rvsnt_ant_z	PDS_score	2335	-0.0120627715	0.5601596680241
caudate_rvsnt_ant_z	hormone_scr_ert_mean_z	2163	-0.0009235512	0.9657591228348
caudate_rvsnt_ant_z	bisbas_ss_basm_rr_z	2323	-0.0136291044	0.5114601245295
caudate_rvsnt_ant_z	rt_diff_large_neutral_z	2135	0.0035885457	0.8683804663115
caudate_rvsnt_ant_z	rt_diff_large_small_z	2143	0.0027205694	0.8998357470434
caudate_rvsnt_ant_z	cbcl_scr_syn_internal_r	2335	-0.0094961720	0.6464947816140
caudate_rvsnt_ant_z	accumbens_rvsnt_ant_z	2306	0.5963711143	0.0000000000000
putamen_rvsnt_ant_z	interview_age	2336	0.0303725159	0.1422338747573
putamen_rvsnt_ant_z	bmi	2321	-0.0378703566	0.0681305325944
putamen_rvsnt_ant_z	PDS_score	2336	0.0084909641	0.6816778890089
putamen_rvsnt_ant_z	hormone_scr_ert_mean_z	2163	0.0172838342	0.4217244997837
putamen_rvsnt_ant_z	bisbas_ss_basm_rr_z	2324	-0.0089881147	0.6649612903899
putamen_rvsnt_ant_z	rt_diff_large_neutral_z	2134	0.0163507533	0.4502880759024
putamen_rvsnt_ant_z	rt_diff_large_small_z	2143	-0.0017338906	0.9360627280707
putamen_rvsnt_ant_z	cbcl_scr_syn_internal_r	2336	-0.0257950259	0.2126652870664
putamen_rvsnt_ant_z	accumbens_rvsnt_ant_z	2309	0.5469812194	0.0000000000000
putamen_rvsnt_ant_z	caudate_rvsnt_ant_z	2318	0.7826410426	0.0000000000000
putamen_rvsnt_ant_z	interview_age	2318	0.2122512422	0.4287332272424

## 6— Compare Outliers to Non-Outliers on Demographic Variables

### Female participants

```
##          interview_age          bmi race.ethnicity.5level
##          4.567958e-03          2.428145e-01          6.700028e-05
##          household.income          high.educ          demo_race_hispanic
##                      NaN          6.700028e-05          1.002051e-01
```

```
##
## -----Summary descriptives table by 'is_outlier_any'-----
##
## -----
##          not outlier      outlier      p.overall
##          N=2492          N=209
## -----
## interview_age          119 (7.52)      117 (7.26)      0.003
## bmi                    18.9 (4.05)      19.2 (4.56)      0.243
## race.ethnicity.5level:          <0.001
##   Asian                59 (2.40%)      2 (0.98%)
##   Black                 359 (14.6%)      47 (23.0%)
##   Mixed                 309 (12.6%)      36 (17.6%)
##   Other                 113 (4.59%)      17 (8.33%)
##   White                1621 (65.9%)     102 (50.0%)
## household.income:
##   [<5K]                 86 (3.73%)      9 (4.64%)
##   [>=200K]              298 (12.9%)      16 (8.25%)
##   [100K-200K]            699 (30.3%)      45 (23.2%)
##   [12K-16K]              54 (2.34%)      7 (3.61%)
##   [16K-25K]              98 (4.25%)      13 (6.70%)
##   [25K-35K]             140 (6.07%)      18 (9.28%)
##   [35K-50K]             193 (8.37%)      22 (11.3%)
##   [50K-75K]             307 (13.3%)      29 (14.9%)
##   [5K-12K]              83 (3.60%)      7 (3.61%)
##   [75K-100K]            347 (15.1%)      28 (14.4%)
## high.educ:
##   < HS Diploma          111 (4.46%)      11 (5.26%)
##   Bachelor              660 (26.5%)      41 (19.6%)
##   HS Diploma/GED        226 (9.07%)      29 (13.9%)
##   Post Graduate Degree   880 (35.3%)      51 (24.4%)
##   Some College           614 (24.6%)      77 (36.8%)
## demo_race_hispanic:          0.080
##   0                     1970 (80.0%)     156 (74.6%)
##   1                     493 (20.0%)      53 (25.4%)
## -----
```

### Male participants

```
##          interview_age          bmi race.ethnicity.5level
##          0.19059592          0.29881812          0.19059592
##          household.income          high.educ          demo_race_hispanic
```

```
##          0.05054040          0.05322671          0.61760333
```

```
##
## -----Summary descriptives table by 'is_outlier_any'-----
##
## -----
##               not outlier    outlier    p.overall
##               N=2665        N=260
## -----
## interview_age          119 (7.47)    119 (7.56)    0.127
## bmi                    18.6 (3.67)    18.9 (4.11)    0.249
## race.ethnicity.5level:                                0.097
##   Asian                58 (2.20%)     7 (2.72%)
##   Black                376 (14.3%)    46 (17.9%)
##   Mixed                313 (11.9%)    38 (14.8%)
##   Other                123 (4.67%)    16 (6.23%)
##   White               1766 (67.0%)   150 (58.4%)
## household.income:                                0.008
##   [<5K]                83 (3.36%)    11 (4.60%)
##   [>=200K]             286 (11.6%)    30 (12.6%)
##   [100K-200K]          787 (31.9%)    76 (31.8%)
##   [12K-16K]             61 (2.47%)     4 (1.67%)
##   [16K-25K]            116 (4.70%)    22 (9.21%)
##   [25K-35K]            143 (5.80%)     9 (3.77%)
##   [35K-50K]            206 (8.35%)    15 (6.28%)
##   [50K-75K]            351 (14.2%)    36 (15.1%)
##   [5K-12K]              78 (3.16%)    14 (5.86%)
##   [75K-100K]           356 (14.4%)    22 (9.21%)
## high.educ:                                0.018
##   < HS Diploma        102 (3.83%)    17 (6.54%)
##   Bachelor             734 (27.6%)    60 (23.1%)
##   HS Diploma/GED      232 (8.72%)    29 (11.2%)
##   Post Graduate Degree 905 (34.0%)    74 (28.5%)
##   Some College         688 (25.9%)    80 (30.8%)
## demo_race_hispanic:                                0.618
##   0                    2110 (80.1%)   198 (78.6%)
##   1                     524 (19.9%)    54 (21.4%)
## -----
```