

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

Results for Sample 1	5
1—Int~Puberty—	5
1.1 Model: CBCL internalizing factor ~ PDS	5
Females	5
Males	6
1.2 Model: CBCL Anxious-Depressed ~ PDS	6
Females	6
Males	7
1.3 Model: CBCL Withdrawn-Depressed ~ PDS	7
Females	7
Males	8
1.4 Model: CBCL Depressed DSM-5 ~ PDS	8
Females	8
Males	9
1.5 Model: CBCL internalizing factor ~ Pubertal category	9
Females	9
Males	10
1.6 Model: CBCL Anxious-Depressed ~ Pubertal category	11
Females	11
Males	11
1.7 Model: CBCL Withdrawn-Depressed ~ Pubertal category	12
Females	12
Males	12
1.8 Model: CBCL Depressed DSM-5 ~ Pubertal category	13
Females	13
Males	13
1.9 Model: CBCL internalizing factor ~ Testosterone	14
Females	14
Males	14
1.10 Model: CBCL Anxious-Depressed ~ Testosterone	15
Females	15
Males	15
1.11 Model: CBCL Withdrawn-Depressed ~ Testosterone	16
Females	16
Males	16
1.12 Model: CBCL Depressed DSM-5 ~ Testosterone	17
Females	17
Males	17
1.13 Model: CBCL internalizing factor ~ Testosterone + PDS	18
Females	18

Males	18
1.14 Model: CBCL internalizing factor ~ Testosterone + Pubertal category	19
Females	19
Males	20
1.15 Model: CBCL Anxious-Depressed ~ Testosterone + PDS	20
Females	20
Males	21
1.16 Model: CBCL Anxious-Depressed ~ Testosterone + Pubertal category	21
Females	21
Males	22
1.17 Model: CBCL Withdrawn-Depressed ~ Testosterone + PDS	22
Females	22
Males	23
1.18 Model: CBCL Withdrawn-Depressed ~ Testosterone + Pubertal category	23
Females	23
Males	24
1.19 Model: CBCL Depressed DSM-5 ~ Testosterone + PDS	24
Females	24
Males	25
1.20 Model: CBCL Depressed DSM-5 ~ Testosterone + Pubertal category	26
Females	26
Males	26
2—Reward~Puberty—	27
2.1 Model: BIS-BAS-RR ~ PDS	27
Females	27
Males	27
2.2 Model : Reaction Time ~ PDS	28
Females	28
Males	28
2.3 Model: Caudate Anticipation ~ PDS	29
Females	29
Males	29
2.4 Model B: Putamen Anticipation ~ PDS	30
Females	30
Males	30
2.5 Model: Accumbens Anticipation ~ PDS	30
Females	30
Males	31
2.6 Model: Caudate Feedback ~ PDS	31
Females	31
Males	32
2.7 Model: Putamen Feedback ~ PDS	32
Females	32
Males	32
2.8 Model: Accumbens Feedback ~ PDS	33
Females	33
Males	33
2.9 Model: OFC Anticipation ~ PDS	34
Females	34
Males	34
2.10 Model: OFC Feedback ~ PDS	35
Females	35
Males	36

2.11 Model: Caudate Anticipation ~ Testosterone	36
Females	36
Males	37
2.12 Model B: Putamen Anticipation ~ Testosterone	37
Females	37
Males	37
2.13 Model: Accumbens Anticipation ~ Testosterone	38
Females	38
Males	38
2.14 Model: Caudate Feedback ~ Testosterone	39
Females	39
Males	39
2.15 Model: Putamen Feedback ~ Testosterone	39
Females	39
Males	40
2.16 Model: Accumbens Feedback ~ Testosterone	40
Females	40
Males	40
2.17 Model: OFC Anticipation ~ Testosterone	41
Females	41
Males	42
2.18 Model: OFC Feedback ~ Testosterone	42
Females	42
Males	43
2.19 Model: MID Reaction Time ~ Testosterone	44
Females	44
Males	44
2.20 Model: BIS-BAS-RR ~ Testosterone	45
Females	45
Males	45
3—Int~Reward—	46
3.1 Model: CBCL internalizing factor ~ Nucleus Accumbens activity (anticipation stage)	46
Females	46
Males	46
3.2 Model: CBCL internalizing factor ~ Caudate activity (anticipation stage)	47
Females	47
Males	47
3.3 Model: CBCL internalizing factor ~ Putamen activity (anticipation stage)	48
Females	48
Males	48
3.4 Model: CBCL internalizing factor ~ Accumbens activity (feedback stage)	49
Females	49
Males	49
3.5 Model: CBCL internalizing factor ~ Caudate activity (feedback stage)	50
Females	50
Males	50
3.6 Model: CBCL internalizing factor ~ Putamen activity (feedback stage)	51
Females	51
Males	51
3.7 Model: CBCL internalizing factor ~ OFC activity (anticipation stage)	52
Females	52
Males	53
3.8 Model: CBCL internalizing factor ~ OFC activity (feedback stage)	54

Females	54
Males	55
3.9 Model: CBCL internalizing factor ~ BIS-BAS-RR	56
Females	56
Males	56
3.10 Model: CBCL internalizing factor ~ MID Reaction Time	57
Females	57
Males	58
4—Int~Puberty x Reward—	59
4.1 Model: CBCL internalizing factor ~ PDS x Accumbens activity (anticipation stage)	59
Females	59
Males	59
4.2 Model: CBCL internalizing factor ~ PDS x Caudate activity (anticipation stage)	60
Females	60
Males	60
4.3 Model: CBCL internalizing factor ~ PDS x Putamen activity (anticipation stage)	61
Females	61
Males	62
4.4 Model: CBCL internalizing factor ~ PDS x Lateral OFC activity (anticipation stage)	62
Females	62
Males	63
4.5 Model: CBCL internalizing factor ~ PDS x Medial OFC activity (anticipation stage)	63
Females	63
Males	64
4.6 Model: CBCL internalizing factor ~ PDS x Accumbens activity (feedback)	64
Females	64
Males	65
4.7 Model: CBCL internalizing factor ~ PDS x Caudate activity (feedback)	66
Females	66
Males	66
4.8 Model: CBCL internalizing factor ~ PDS x Putamen activity (feedback)	67
Females	67
Males	67
4.9 Model: CBCL internalizing factor ~ PDS x Lateral OFC activity (feedback stage)	68
Females	68
Males	69
4.10 Model: CBCL internalizing factor ~ PDS x Medial OFC activity (feedback stage)	69
Females	69
Males	70
4.11 Model: CBCL internalizing factor ~ PDS x BIS-BAS	70
Females	70
Males	71
4.12 Model: CBCL internalizing factor ~ PDS x MID reaction time (large reward vs. neutral)	71
Females	71
Males	72
4.13 Model: CBCL internalizing factor ~ PDS x MID reaction time (large vs. small reward)	73
Females	73
Males	73
4.14 Model: CBCL internalizing factor ~ Testosterone x Accumbens activity (anticipation stage) + PDS	74
Females	74
Males	74
4.15 Model: CBCL internalizing factor ~ Testosterone x Caudate activity (anticipation stage) + PDS	75

Females	75
Males	76
4.16 Model: CBCL internalizing factor ~ Testosterone x Putamen activity (anticipation stage) + PDS	77
Females	77
Males	78
4.17 Model: CBCL internalizing factor ~ Testosterone x Accumbens activity (feedback stage) + PDS	79
Females	79
Males	79
4.18 Model: CBCL internalizing factor ~ Testosterone x Caudate activity (Feedback stage) + PDS	80
Females	80
Males	81
4.19 Model: CBCL internalizing factor ~ Testosterone x Putamen activity (Feedback stage) + PDS	82
Females	82
Males	83
4.20 Model: CBCL internalizing factor ~ Testosterone x Lateral OFC activity (anticipation stage) + PDS	84
Females	84
Males	84
4.21 Model: CBCL internalizing factor ~ Testosterone x Medial OFC activity (anticipation stage) + PDS	85
Females	85
Males	85
4.22 Model: CBCL internalizing factor ~ Testosterone x Lateral OFC activity (feedback stage) + PDS	86
Females	86
Males	87
4.23 Model: CBCL internalizing factor ~ Testosterone x Medial OFC activity (feedback stage) + PDS	88
Females	88
Males	88
4.24 Model: CBCL internalizing factor ~ Testosterone x BIS-BAS RR + PDS	89
Females	89
Males	90
4.25 Model: CBCL internalizing factor ~ Testosterone x MID Reaction Time + PDS (large reward vs. neutral)	91
Females	91
Males	92
4.26 Model: CBCL internalizing factor ~ Testosterone x MID Reaction Time + PDS (large vs. small reward)	92
Females	92
Males	93

Results for Sample 1

1—Int~Puberty—

1.1 Model: CBCL internalizing factor ~ PDS

Females

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

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

Males

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

1.2 Model: CBCL Anxious-Depressed ~ PDS

Females

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

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

Males

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

1.3 Model: CBCL Withdrawn-Depressed ~ PDS

Females

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

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

Males

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

1.4 Model: CBCL Depressed DSM-5 ~ PDS

Females

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



```
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ PDS_score + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.500757   0.632217   0.792 0.428394
## PDS_score       0.191889   0.053684   3.574 0.000357 ***
## race.ethnicity.5levelBlack 0.220848   0.266590   0.828 0.407508
## race.ethnicity.5levelMixed 0.677402   0.266390   2.543 0.011051 *
## race.ethnicity.5levelOther 0.837469   0.304982   2.746 0.006075 **
## race.ethnicity.5levelWhite 0.519547   0.249759   2.080 0.037604 *
## interview_age   -0.001794   0.004979  -0.360 0.718640
## demo_race_hispanic1 0.107590   0.104881   1.026 0.305064
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0102
## lmer.REML = 10738 Scale est. = 1.7625    n = 2640
```

Males

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

1.5 Model: CBCL internalizing factor ~ Pubertal category

Females

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

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

Males

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

1.6 Model: CBCL Anxious-Depressed ~ Pubertal category

Females

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

Males

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

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

1.7 Model: CBCL Withdrawn-Depressed ~ Pubertal category

Females

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

Males

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

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

1.8 Model: CBCL Depressed DSM-5 ~ Pubertal category

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ pds_p_ss_category + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.861575   0.644696   1.336 0.18153
## pds_p_ss_categoryEarly 0.256133   0.098889   2.590 0.00965 **
## pds_p_ss_categoryLate 0.731980   0.244492   2.994 0.00278 **
## pds_p_ss_categoryMid 0.380329   0.093369   4.073 4.77e-05 ***
## race.ethnicity.5levelBlack 0.216245   0.266521   0.811 0.41723
## race.ethnicity.5levelMixed 0.687983   0.266189   2.585 0.00980 **
## race.ethnicity.5levelOther 0.840944   0.304487   2.762 0.00579 **
## race.ethnicity.5levelWhite 0.535046   0.249565   2.144 0.03213 *
## interview_age   -0.004198   0.005054  -0.831 0.40625
## demo_race_hispanic1 0.079854   0.105192   0.759 0.44785
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0122
## lmer.REML = 10734 Scale est. = 1.7498 n = 2640
```

Males

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

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

1.9 Model: CBCL internalizing factor ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean_z + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.98935    1.92717   1.032  0.30205
## hormone_scr_ert_mean_z  0.11092    0.14103   0.787  0.43165
## race.ethnicity.5levelBlack  0.35281    0.79371   0.445  0.65671
## race.ethnicity.5levelMixed  1.82435    0.79375   2.298  0.02162 *
## race.ethnicity.5levelOther  2.64127    0.90874   2.907  0.00369 **
## race.ethnicity.5levelWhite  1.43759    0.74505   1.930  0.05378 .
## interview_age    0.01330    0.01488   0.894  0.37145
## demo_race_hispanic1  0.11174    0.32610   0.343  0.73189
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00669
## lmer.REML = 15262  Scale est. = 12.986    n = 2455
```

Males

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

```
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.288704    1.886421   1.213  0.22514
## hormone_scr_ert_mean_z  0.042062    0.145369   0.289  0.77234
## race.ethnicity.5levelBlack 1.730202    0.770231   2.246  0.02476 *
## race.ethnicity.5levelMixed 2.137600    0.772813   2.766  0.00571 **
## race.ethnicity.5levelOther 1.867855    0.890529   2.097  0.03605 *
## race.ethnicity.5levelWhite 1.586971    0.723139   2.195  0.02828 *
## interview_age      0.008748    0.014636   0.598  0.55009
## demo_race_hispanic1  0.361685    0.311735   1.160  0.24606
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000816
## lmer.REML = 16637  Scale est. = 16.117    n = 2662
```

1.10 Model: CBCL Anxious-Depressed ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean_z + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.356564    1.089604   1.245  0.2132
## hormone_scr_ert_mean_z  0.096447    0.079720   1.210  0.2265
## race.ethnicity.5levelBlack 0.032975    0.445097   0.074  0.9409
## race.ethnicity.5levelMixed 0.856813    0.445341   1.924  0.0545 .
## race.ethnicity.5levelOther 1.034197    0.510424   2.026  0.0429 *
## race.ethnicity.5levelWhite 0.849795    0.417979   2.033  0.0421 *
## interview_age      0.003515    0.008426   0.417  0.6766
## demo_race_hispanic1 -0.026234    0.182648  -0.144  0.8858
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00677
## lmer.REML = 12463  Scale est. = 4.9139    n = 2455
```

Males

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

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.4506517   1.0531635   1.377  0.16850
## hormone_scr_ert_mean_z -0.0163616  0.0811269  -0.202  0.84018
## race.ethnicity.5levelBlack 0.8160606  0.4291215   1.902  0.05732 .
## race.ethnicity.5levelMixed 1.1553141  0.4310551   2.680  0.00740 **
## race.ethnicity.5levelOther 1.0693544  0.4955891   2.158  0.03104 *
## race.ethnicity.5levelWhite 1.0419610  0.4034186   2.583  0.00985 **
## interview_age      0.0002377  0.0081704   0.029  0.97679
## demo_race_hispanic1 0.1487317  0.1724590   0.862  0.38854
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00155
## lmer.REML = 13552  Scale est. = 6.9729    n = 2662
```

1.11 Model: CBCL Withdrawn-Depressed ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean_z + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.188476   0.559617   0.337  0.7363
## hormone_scr_ert_mean_z 0.028288  0.040942   0.691  0.4897
## race.ethnicity.5levelBlack 0.276466  0.226294   1.222  0.2219
## race.ethnicity.5levelMixed 0.432674  0.226727   1.908  0.0565 .
## race.ethnicity.5levelOther 0.595452  0.260329   2.287  0.0223 *
## race.ethnicity.5levelWhite 0.253102  0.212688   1.190  0.2342
## interview_age      0.003404  0.004338   0.785  0.4327
## demo_race_hispanic1 0.144974  0.092467   1.568  0.1170
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00436
## lmer.REML = 9204.8  Scale est. = 1.6289    n = 2455
```

Males

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



```
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.390499   0.584535   0.668   0.50416
## hormone_scr_ert_mean_z 0.032110   0.044736   0.718   0.47296
## race.ethnicity.5levelBlack 0.677569   0.236922   2.860   0.00427 **
## race.ethnicity.5levelMixed 0.653259   0.239425   2.728   0.00641 **
## race.ethnicity.5levelOther 0.451677   0.275602   1.639   0.10136
## race.ethnicity.5levelWhite 0.415233   0.222934   1.863   0.06263 .
## interview_age      0.001831   0.004546   0.403   0.68714
## demo_race_hispanic1 0.058716   0.090960   0.646   0.51865
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0036
## lmer.REML = 10467  Scale est. = 2.1906    n = 2662
```

1.12 Model: CBCL Depressed DSM-5 ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean_z + race.ethnicity.5level +
##   interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.126990   0.654459   0.194   0.84616
## hormone_scr_ert_mean_z 0.032777   0.047943   0.684   0.49425
## race.ethnicity.5levelBlack 0.288922   0.265880   1.087   0.27729
## race.ethnicity.5levelMixed 0.688931   0.267039   2.580   0.00994 **
## race.ethnicity.5levelOther 0.886017   0.306909   2.887   0.00392 **
## race.ethnicity.5levelWhite 0.551231   0.249945   2.205   0.02752 *
## interview_age      0.003798   0.005072   0.749   0.45402
## demo_race_hispanic1 0.067683   0.107691   0.628   0.52974
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00536
## lmer.REML = 9990.2  Scale est. = 1.7457    n = 2455
```

Males

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

```
##      interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.484792   0.722624   0.671   0.5024
## hormone_scr_ert_mean_z 0.014469   0.055563   0.260   0.7946
## race.ethnicity.5levelBlack 0.593223   0.293932   2.018   0.0437 *
## race.ethnicity.5levelMixed 0.706967   0.295869   2.389   0.0169 *
## race.ethnicity.5levelOther 0.535419   0.340694   1.572   0.1162
## race.ethnicity.5levelWhite 0.514409   0.276302   1.862   0.0627 .
## interview_age      0.003136   0.005614   0.559   0.5764
## demo_race_hispanic1 -0.020224   0.116498  -0.174   0.8622
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = -0.000396
## lmer.REML = 11562 Scale est. = 2.8469    n = 2662
```

1.13 Model: CBCL internalizing factor ~ Testosterone + PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean_z + PDS_score +
##      race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.516389   1.928130   1.305 0.191984
## hormone_scr_ert_mean_z -0.011605   0.144809  -0.080 0.936130
## PDS_score          0.606502   0.169662   3.575 0.000357 ***
## race.ethnicity.5levelBlack -0.039791   0.799334  -0.050 0.960302
## race.ethnicity.5levelMixed 1.642126   0.793441   2.070 0.038592 *
## race.ethnicity.5levelOther 2.406230   0.908905   2.647 0.008164 **
## race.ethnicity.5levelWhite 1.345234   0.743649   1.809 0.070579 .
## interview_age      0.001635   0.015196   0.108 0.914321
## demo_race_hispanic1  0.099045   0.325274   0.304 0.760774
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.011
## lmer.REML = 15251 Scale est. = 12.934    n = 2455
```

Males

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

```
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean_z + PDS_score +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.354331   1.879856   1.252   0.2105
## hormone_scr_ert_mean_z -0.030295   0.145767  -0.208   0.8354
## PDS_score         0.946480   0.210791   4.490 7.42e-06 ***
## race.ethnicity.5levelBlack 1.361023   0.772027   1.763   0.0780 .
## race.ethnicity.5levelMixed 2.047911   0.770394   2.658   0.0079 **
## race.ethnicity.5levelOther 1.743224   0.887939   1.963   0.0497 *
## race.ethnicity.5levelWhite 1.549586   0.720716   2.150   0.0316 *
## interview_age     -0.001733   0.014772  -0.117   0.9066
## demo_race_hispanic1  0.280794   0.311400   0.902   0.3673
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00709
## lmer.REML = 16618 Scale est. = 15.845    n = 2662
```

1.14 Model: CBCL internalizing factor ~ Testosterone + Pubertal category

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean_z + pds_p_ss_category +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.230046   1.957474   1.650 0.09905 .
## hormone_scr_ert_mean_z 0.009319   0.143430   0.065 0.94820
## pds_p_ss_categoryEarly 0.930597   0.298032   3.122 0.00181 **
## pds_p_ss_categoryLate 1.103831   0.773750   1.427 0.15382
## pds_p_ss_categoryMid  1.227407   0.288817   4.250 2.22e-05 ***
## race.ethnicity.5levelBlack 0.001752   0.799273   0.002 0.99825
## race.ethnicity.5levelMixed 1.690778   0.793001   2.132 0.03310 *
## race.ethnicity.5levelOther 2.475647   0.907556   2.728 0.00642 **
## race.ethnicity.5levelWhite 1.400154   0.743189   1.884 0.05969 .
## interview_age     -0.002717   0.015394  -0.176 0.85992
## demo_race_hispanic1  0.051251   0.326287   0.157 0.87520
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0124
## lmer.REML = 15243 Scale est. = 12.777    n = 2455
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ hormone_scr_ert_mean_z + pds_p_ss_category +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.0338221   1.8943098   1.602  0.10938
## hormone_scr_ert_mean_z 0.0001906   0.1456180   0.001  0.99896
## pds_p_ss_categoryEarly 0.8193234   0.2598210   3.153  0.00163 **
## pds_p_ss_categoryLate  0.8442856   1.5928930   0.530  0.59613
## pds_p_ss_categoryMid   1.2422686   0.5223302   2.378  0.01746 *
## race.ethnicity.5levelBlack 1.4368909   0.7737626   1.857  0.06342 .
## race.ethnicity.5levelMixed 2.0943552   0.7716685   2.714  0.00669 **
## race.ethnicity.5levelOther 1.8063668   0.8896852   2.030  0.04242 *
## race.ethnicity.5levelWhite 1.5950864   0.7218353   2.210  0.02721 *
## interview_age        0.0007330   0.0147796   0.050  0.96045
## demo_race_hispanic1   0.2526813   0.3127912   0.808  0.41926
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00472
## lmer.REML = 16621  Scale est. = 16.151    n = 2662
```

1.15 Model: CBCL Anxious-Depressed ~ Testosterone + PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean_z + PDS_score +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.5085714   1.0921893   1.381  0.1673
## hormone_scr_ert_mean_z 0.0604191   0.0820705   0.736  0.4617
## PDS_score       0.1757743   0.0959317   1.832  0.0670 .
## race.ethnicity.5levelBlack -0.0813774   0.4492013  -0.181  0.8563
## race.ethnicity.5levelMixed  0.8036564   0.4460337   1.802  0.0717 .
## race.ethnicity.5levelOther  0.9652041   0.5115285   1.887  0.0593 .
## race.ethnicity.5levelWhite  0.8226179   0.4179988   1.968  0.0492 *
## interview_age        0.0001454   0.0086195   0.017  0.9865
## demo_race_hispanic1   -0.0298528   0.1825416  -0.164  0.8701
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
##
## R-sq.(adj) = 0.00769
## lmer.REML = 12463 Scale est. = 4.9213 n = 2455
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean_z + PDS_score +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.493694   1.050366   1.422  0.1551
## hormone_scr_ert_mean_z -0.053354   0.081421  -0.655  0.5123
## PDS_score       0.482040   0.117552   4.101 4.24e-05 ***
## race.ethnicity.5levelBlack 0.625500   0.430524   1.453  0.1464
## race.ethnicity.5levelMixed 1.107946   0.430019   2.577  0.0100 *
## race.ethnicity.5levelOther 1.006492   0.494473   2.035  0.0419 *
## race.ethnicity.5levelWhite 1.021452   0.402377   2.539  0.0112 *
## interview_age   -0.005176   0.008255  -0.627  0.5307
## demo_race_hispanic1 0.108151   0.172504   0.627  0.5307
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00678
## lmer.REML = 13538 Scale est. = 6.8744 n = 2662
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean_z + pds_p_ss_category +
##   race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.641011   1.109420   1.479  0.13923
## hormone_scr_ert_mean_z 0.071923   0.081310   0.885  0.37649
## pds_p_ss_categoryEarly 0.455204   0.169054   2.693  0.00714 **
## pds_p_ss_categoryLate 0.101533   0.440028   0.231  0.81753
## pds_p_ss_categoryMid 0.401992   0.163236   2.463  0.01386 *
## race.ethnicity.5levelBlack -0.041493   0.449227  -0.092  0.92642
## race.ethnicity.5levelMixed 0.831790   0.445833   1.866  0.06220 .
## race.ethnicity.5levelOther 0.999392   0.510807   1.956  0.05052 .
```

```
## race.ethnicity.5levelWhite  0.848107    0.417800    2.030  0.04247 *
## interview_age               -0.001117    0.008738   -0.128  0.89827
## demo_race_hispanic1        -0.039209    0.183181   -0.214  0.83053
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0089
## lmer.REML = 12458  Scale est. = 4.8824    n = 2455
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_anxdep_r ~ hormone_scr_ert_mean_z + pds_p_ss_category +
##    race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.847072    1.057852   1.746 0.080917 .
## hormone_scr_ert_mean_z -0.036787    0.081305  -0.452 0.650977
## pds_p_ss_categoryEarly  0.483928    0.145225   3.332 0.000873 ***
## pds_p_ss_categoryLate  0.599782    0.894018   0.671 0.502353
## pds_p_ss_categoryMid   0.474670    0.290617   1.633 0.102521
## race.ethnicity.5levelBlack 0.673737    0.431316   1.562 0.118395
## race.ethnicity.5levelMixed 1.140006    0.430553   2.648 0.008150 **
## race.ethnicity.5levelOther 1.053088    0.495261   2.126 0.033568 *
## race.ethnicity.5levelWhite 1.050101    0.402860   2.607 0.009195 **
## interview_age       -0.004115    0.008252  -0.499 0.618098
## demo_race_hispanic1  0.094049    0.173295   0.543 0.587377
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00479
## lmer.REML = 13541  Scale est. = 6.9735    n = 2662
```

1.17 Model: CBCL Withdrawn-Depressed ~ Testosterone + PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean_z + PDS_score +
##    race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.453e-01  5.595e-01   0.617 0.537147
```

```
## hormone_scr_ert_mean_z      -9.991e-03  4.208e-02  -0.237  0.812332
## PDS_score                   1.825e-01  4.910e-02   3.717  0.000206 ***
## race.ethnicity.5levelBlack  1.588e-01  2.278e-01   0.697  0.485872
## race.ethnicity.5levelMixed  3.786e-01  2.265e-01   1.671  0.094838 .
## race.ethnicity.5levelOther  5.241e-01  2.603e-01   2.013  0.044202 *
## race.ethnicity.5levelWhite  2.258e-01  2.121e-01   1.064  0.287241
## interview_age               -8.579e-05  4.425e-03  -0.019  0.984533
## demo_race_hispanic1         1.397e-01  9.203e-02   1.518  0.129068
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00942
## lmer.REML = 9195.3  Scale est. = 1.6056    n = 2455
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean_z + PDS_score +
##      race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.4126580  0.5835381   0.707  0.47953
## hormone_scr_ert_mean_z  0.0148393  0.0449711   0.330  0.74145
## PDS_score       0.2141085  0.0656348   3.262  0.00112 **
## race.ethnicity.5levelBlack  0.5867078  0.2381327   2.464  0.01381 *
## race.ethnicity.5levelMixed  0.6305339  0.2390971   2.637  0.00841 **
## race.ethnicity.5levelOther  0.4254271  0.2752322   1.546  0.12230
## race.ethnicity.5levelWhite  0.4066557  0.2225500   1.827  0.06777 .
## interview_age    -0.0005826  0.0045981  -0.127  0.89919
## demo_race_hispanic1  0.0383757  0.0910183   0.422  0.67333
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00703
## lmer.REML = 10460  Scale est. = 2.1766    n = 2662
```

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

Females

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

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.675084   0.568042   1.188  0.23478
## hormone_scr_ert_mean_z -0.009769   0.041665  -0.234  0.81464
## pds_p_ss_categoryEarly  0.224127   0.086839   2.581  0.00991 **
## pds_p_ss_categoryLate   0.687064   0.226587   3.032  0.00245 **
## pds_p_ss_categoryMid    0.353545   0.083446   4.237 2.35e-05 ***
## race.ethnicity.5levelBlack 0.155685   0.227556   0.684  0.49394
## race.ethnicity.5levelMixed 0.389760   0.226221   1.723  0.08503 .
## race.ethnicity.5levelOther 0.529425   0.259799   2.038  0.04168 *
## race.ethnicity.5levelWhite 0.240926   0.211748   1.138  0.25532
## interview_age        -0.002197   0.004484  -0.490  0.62424
## demo_race_hispanic1    0.113657   0.092119   1.234  0.21739
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0118
## lmer.REML = 9191.2  Scale est. = 1.5913    n = 2455
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_withdep_r ~ hormone_scr_ert_mean_z + pds_p_ss_category +
##      race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      5.626e-01  5.873e-01   0.958  0.3382
## hormone_scr_ert_mean_z  2.007e-02  4.487e-02   0.447  0.6546
## pds_p_ss_categoryEarly  1.544e-01  8.119e-02   1.901  0.0574 .
## pds_p_ss_categoryLate   5.605e-02  5.007e-01   0.112  0.9109
## pds_p_ss_categoryMid    4.500e-01  1.626e-01   2.767  0.0057 **
## race.ethnicity.5levelBlack 5.899e-01  2.384e-01   2.474  0.0134 *
## race.ethnicity.5levelMixed 6.339e-01  2.392e-01   2.650  0.0081 **
## race.ethnicity.5levelOther 4.253e-01  2.755e-01   1.543  0.1228
## race.ethnicity.5levelWhite 4.130e-01  2.227e-01   1.855  0.0638 .
## interview_age        6.142e-05  4.593e-03   0.013  0.9893
## demo_race_hispanic1    2.913e-02  9.145e-02   0.319  0.7501
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00625
## lmer.REML = 10462  Scale est. = 2.1968    n = 2662
```

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

Females

```
##
```



```
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean_z + PDS_score +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2847402   0.6551781    0.435  0.66389
## hormone_scr_ert_mean_z -0.0043878   0.0492851   -0.089  0.92907
## PDS_score         0.1822921   0.0577433    3.157  0.00161 **
## race.ethnicity.5levelBlack 0.1673208   0.2681581    0.624  0.53271
## race.ethnicity.5levelMixed 0.6324275   0.2671364    2.367  0.01799 *
## race.ethnicity.5levelOther 0.8147984   0.3071627    2.653  0.00804 **
## race.ethnicity.5levelWhite 0.5222341   0.2496410    2.092  0.03655 *
## interview_age      0.0003155   0.0051817    0.061  0.95146
## demo_race_hispanic1  0.0636657   0.1074903    0.592  0.55371
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00871
## lmer.REML = 9984.2  Scale est. = 1.7421    n = 2455
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean_z + PDS_score +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.5047512   0.7214946    0.700  0.48424
## hormone_scr_ert_mean_z -0.0060578   0.0558437   -0.108  0.91362
## PDS_score         0.2628445   0.0810019    3.245  0.00119 **
## race.ethnicity.5levelBlack 0.4870818   0.2953160    1.649  0.09919 .
## race.ethnicity.5levelMixed 0.6807554   0.2954991    2.304  0.02131 *
## race.ethnicity.5levelOther 0.5015710   0.3403008    1.474  0.14063
## race.ethnicity.5levelWhite 0.5035789   0.2759050    1.825  0.06808 .
## interview_age      0.0002189   0.0056777    0.039  0.96925
## demo_race_hispanic1 -0.0428367   0.1166713   -0.367  0.71353
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0025
## lmer.REML = 11554  Scale est. = 2.8294    n = 2662
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean_z + pds_p_ss_category +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.584728   0.665454   0.879  0.37966
## hormone_scr_ert_mean_z -0.003839   0.048826  -0.079  0.93733
## pds_p_ss_categoryEarly  0.221817   0.101911   2.177  0.02961 *
## pds_p_ss_categoryLate   0.484378   0.264889   1.829  0.06758 .
## pds_p_ss_categoryMid    0.387541   0.098255   3.944 8.23e-05 ***
## race.ethnicity.5levelBlack 0.152286   0.268220   0.568  0.57025
## race.ethnicity.5levelMixed 0.633976   0.267029   2.374  0.01766 *
## race.ethnicity.5levelOther 0.819772   0.306764   2.672  0.00758 **
## race.ethnicity.5levelWhite 0.531661   0.249522   2.131  0.03321 *
## interview_age        -0.001587   0.005251  -0.302  0.76251
## demo_race_hispanic1    0.044392   0.107867   0.412  0.68071
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0101
## lmer.REML =  9981  Scale est. = 1.7258    n = 2455
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_dsm5_depress_r ~ hormone_scr_ert_mean_z + pds_p_ss_category +
##     race.ethnicity.5level + interview_age + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.584728   0.665454   0.879  0.37966
## hormone_scr_ert_mean_z -0.003839   0.048826  -0.079  0.93733
## pds_p_ss_categoryEarly  0.221817   0.101911   2.177  0.02961 *
## pds_p_ss_categoryLate   0.484378   0.264889   1.829  0.06758 .
## pds_p_ss_categoryMid    0.387541   0.098255   3.944 8.23e-05 ***
## race.ethnicity.5levelBlack 0.152286   0.268220   0.568  0.57025
## race.ethnicity.5levelMixed 0.633976   0.267029   2.374  0.01766 *
## race.ethnicity.5levelOther 0.819772   0.306764   2.672  0.00758 **
## race.ethnicity.5levelWhite 0.531661   0.249522   2.131  0.03321 *
## interview_age        -0.001587   0.005251  -0.302  0.76251
## demo_race_hispanic1    0.044392   0.107867   0.412  0.68071
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0101
## lmer.REML =   9981  Scale est. = 1.7258    n = 2455
```

2—Reward~Puberty—

2.1 Model: BIS-BAS-RR ~ PDS

Females

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

Males

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

2.2 Model : Reaction Time ~ PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.571406   0.316653  -1.805   0.0713 .
## PDS_score    -0.020896   0.028544  -0.732   0.4642
## interview_age  0.005458   0.002729   2.000   0.0456 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00104
## lmer.REML = 5939.4  Scale est. = 0.67983    n = 2201
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.347746   0.318216  -1.093   0.275
## PDS_score    -0.026961   0.028607  -0.942   0.346
## interview_age  0.003429   0.002742   1.250   0.211
##
##
## R-sq.(adj) =  0.000134
## lmer.REML = 5963.6  Scale est. = 0.77204    n = 2201
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.1377075  0.2925250   0.471   0.6379
## PDS_score    -0.0677145  0.0353646  -1.915   0.0556 .
## interview_age -0.0004923  0.0024809  -0.198   0.8427
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

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

##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.0768858  0.2956580   0.260   0.795
## PDS_score     -0.0336578  0.0356573  -0.944   0.345
## interview_age -0.0002174  0.0025086  -0.087   0.931
##
##
## R-sq.(adj) = -0.000241
## lmer.REML = 6019.1 Scale est. = 0.7024 n = 2303
```

2.3 Model: Caudate Anticipation ~ PDS

Females

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

Males

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

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

2.4 Model B: Putamen Anticipation ~ PDS

Females

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

Males

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

2.5 Model: Accumbens Anticipation ~ PDS

Females

```
##
```

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

Males

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

2.6 Model: Caudate Feedback ~ PDS

Females

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

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

Males

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

2.7 Model: Putamen Feedback ~ PDS

Females

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

Males

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



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

2.8 Model: Accumbens Feedback ~ PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.457769  0.230801   1.983   0.0475 *
## PDS_score    -0.001013  0.020566  -0.049   0.9607
## interview_age -0.003938  0.001988  -1.981   0.0477 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00106
## lmer.REML = 4078.6  Scale est. = 0.42369   n = 2050
```

Males

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

2.9 Model: OFC Anticipation ~ PDS

Females

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

Males

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

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvsn_ant_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.1174623  0.2355002  -0.499  0.61799
## PDS_score    0.0776497  0.0286198   2.713  0.00672 **
## interview_age 0.0001156  0.0020019   0.058  0.95395
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00338
## lmer.REML = 4197.2  Scale est. = 0.37935    n = 2055
```

2.10 Model: OFC Feedback ~ PDS

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.250497  0.179292   1.397   0.163
## PDS_score    0.009944  0.016003   0.621   0.534
## interview_age -0.002448  0.001545  -1.585   0.113
##
##
## R-sq.(adj) =  0.000286
## lmer.REML = 3018.9  Scale est. = 0.22332    n = 2039
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ PDS_score + interview_age
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0649136  0.2204114   0.295   0.768
## PDS_score    0.0101010  0.0197079   0.513   0.608
## interview_age -0.0007488  0.0018984  -0.394   0.693
##
##
## R-sq.(adj) = -0.000837
```

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

Males

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

2.11 Model: Caudate Anticipation ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.591761  0.335016  -1.766  0.0775 .
## hormone_scr_ert_mean_z -0.030690  0.026111  -1.175  0.2400
## interview_age  0.005087  0.002808   1.812  0.0702 .
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0013
## lmer.REML = 5024.1  Scale est. = 0.79373    n = 1914
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_rvsn_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.074125   0.349808  -0.212    0.832
## hormone_scr_ert_mean_z  0.013253   0.028742   0.461    0.645
## interview_age    0.000623   0.002915   0.214    0.831
##
##
## R-sq.(adj) = -0.000807
## lmer.REML = 5205.4  Scale est. = 0.63774    n = 1912
```

2.12 Model B: Putamen Anticipation ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_rvsn_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.383966   0.325368  -1.180    0.238
## hormone_scr_ert_mean_z -0.020326   0.025357  -0.802    0.423
## interview_age    0.003171   0.002727   1.163    0.245
##
##
## R-sq.(adj) = -4.16e-05
## lmer.REML = 4908.1  Scale est. = 0.74258    n = 1912
```

Males

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

```
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.327936   0.346500  -0.946   0.344
## hormone_scr_ert_mean_z  0.041862   0.028598   1.464   0.143
## interview_age     0.002867   0.002885   0.994   0.321
##
##
## R-sq.(adj) =  0.00137
## lmer.REML = 5165.6  Scale est. = 0.67645   n = 1912
```

2.13 Model: Accumbens Anticipation ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.244643   0.254957  -0.960   0.3374
## hormone_scr_ert_mean_z -0.034201   0.019891  -1.719   0.0857 .
## interview_age     0.002162   0.002140   1.010   0.3124
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.000903
## lmer.REML = 3995.4  Scale est. = 0.43175   n = 1915
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_rvsnt_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     0.3072737   0.2726446   1.127   0.260
## hormone_scr_ert_mean_z -0.0002691   0.0222342  -0.012   0.990
## interview_age    -0.0025160   0.0022728  -1.107   0.268
##
##
## R-sq.(adj) = -0.000402
## lmer.REML = 4290.1  Scale est. = 0.48971   n = 1915
```

2.14 Model: Caudate Feedback ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.045803   0.320271   3.265 0.001113 **
## hormone_scr_ert_mean_z 0.051043   0.024845   2.054 0.040066 *
## interview_age   -0.009016   0.002691  -3.350 0.000823 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00575
## lmer.REML = 4869.7  Scale est. = 0.74228  n = 1910
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## caudate_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.131005   0.322819   0.406   0.685
## hormone_scr_ert_mean_z 0.032040   0.026431   1.212   0.226
## interview_age   -0.000708   0.002690  -0.263   0.792
##
##
## R-sq.(adj) = -0.000313
## lmer.REML = 4926.5  Scale est. = 0.76028  n = 1913
```

2.15 Model: Putamen Feedback ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.713151   0.303944   2.346 0.01906 *
```

```
## hormone_scr_ert_mean_z 0.066484 0.023695 2.806 0.00507 **
## interview_age -0.006442 0.002554 -2.523 0.01173 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00502
## lmer.REML = 4670.9 Scale est. = 0.66712 n = 1911
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## putamen_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.452903  0.320646   1.412   0.158
## hormone_scr_ert_mean_z 0.030225  0.026440   1.143   0.253
## interview_age  -0.003121  0.002665  -1.171   0.242
##
##
## R-sq.(adj) = -5.75e-05
## lmer.REML = 4892.1 Scale est. = 0.70784 n = 1917
```

2.16 Model: Accumbens Feedback ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.471274  0.236219   1.995  0.0462 *
## hormone_scr_ert_mean_z 0.004098  0.018377   0.223  0.8235
## interview_age  -0.004118  0.001985  -2.075  0.0382 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00121
## lmer.REML = 3728.7 Scale est. = 0.40449 n = 1918
```

Males

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



```
## Link function: identity
##
## Formula:
## accumbens_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0951261  0.2637942   0.361   0.718
## hormone_scr_ert_mean_z 0.0302771  0.0216948   1.396   0.163
## interview_age   -0.0003079  0.0021966  -0.140   0.889
##
##
## R-sq.(adj) = 0.000179
## lmer.REML = 4110.6  Scale est. = 0.40831  n = 1909
```

2.17 Model: OFC Anticipation ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvs_n_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0141014  0.2148549  -0.066   0.948
## hormone_scr_ert_mean_z -0.0125712  0.0167194  -0.752   0.452
## interview_age    0.0002391  0.0018052   0.132   0.895
##
##
## R-sq.(adj) = -0.000731
## lmer.REML = 3330.6  Scale est. = 0.30454  n = 1908
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvs_n_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0841768  0.2462446   0.342   0.733
## hormone_scr_ert_mean_z 0.0049225  0.0191536   0.257   0.797
## interview_age   -0.0007006  0.0020693  -0.339   0.735
##
##
## R-sq.(adj) = -0.000971
## lmer.REML = 3856.2  Scale est. = 0.43719  n = 1908
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_rvs_n_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.355274   0.229261  -1.550   0.121
## hormone_scr_ert_mean_z -0.030847   0.018868  -1.635   0.102
## interview_age     0.003033   0.001911   1.587   0.113
##
##
## R-sq.(adj) = 0.00138
## lmer.REML = 3591.8  Scale est. = 0.29077  n = 1909
##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_rvs_n_ant_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.249360   0.250089  -0.997   0.319
## hormone_scr_ert_mean_z -0.019065   0.020418  -0.934   0.351
## interview_age     0.002128   0.002085   1.020   0.308
##
##
## R-sq.(adj) = -0.000168
## lmer.REML = 3920.4  Scale est. = 0.37746  n = 1905
```

2.18 Model: OFC Feedback ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.326363   0.187426   1.741   0.0818 .
## hormone_scr_ert_mean_z 0.025014   0.014583   1.715   0.0865 .
## interview_age   -0.002987   0.001575  -1.896   0.0581 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## R-sq.(adj) = 0.00188
## lmer.REML = 2823.9 Scale est. = 0.21672 n = 1910

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.147132   0.228833   0.643    0.52
## hormone_scr_ert_mean_z 0.014706   0.017849   0.824    0.41
## interview_age  -0.001327   0.001921  -0.691    0.49
##
##
## R-sq.(adj) = -0.000438
## lmer.REML = 3568.5 Scale est. = 0.33149 n = 1912
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## lOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.122210   0.204604  -0.597    0.550
## hormone_scr_ert_mean_z 0.001823   0.016784   0.109    0.914
## interview_age  0.001347   0.001705   0.790    0.430
##
##
## R-sq.(adj) = -0.000688
## lmer.REML = 3218.3 Scale est. = 0.3098 n = 1919

##
## Family: gaussian
## Link function: identity
##
## Formula:
## mOFC_posvsneg_feedback_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0571267  0.2376761   0.240    0.810
## hormone_scr_ert_mean_z 0.0164587  0.0194398   0.847    0.397
## interview_age  -0.0001319  0.0019825  -0.067    0.947
##
##
## R-sq.(adj) = -0.000783
```

```
## lmer.REML = 3764.8  Scale est. = 0.30053  n = 1917
```

2.19 Model: MID Reaction Time ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.681474   0.329314  -2.069   0.0386 *
## hormone_scr_ert_mean_z -0.029941   0.025743  -1.163   0.2449
## interview_age     0.006150   0.002765   2.224   0.0262 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00186
## lmer.REML = 5546.3  Scale est. = 0.69013  n = 2062
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.396605   0.332388  -1.193   0.233
## hormone_scr_ert_mean_z -0.016785   0.025964  -0.646   0.518
## interview_age     0.003421   0.002791   1.226   0.220
##
##
## R-sq.(adj) =  3.89e-06
## lmer.REML = 5585.5  Scale est. = 0.75016  n = 2062
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_neutral_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     0.089835   0.306788   0.293   0.770
## hormone_scr_ert_mean_z -0.011286   0.025188  -0.448   0.654
```

```
## interview_age          -0.000843   0.002557  -0.330    0.742
##
##
## R-sq.(adj) =  -0.000666
## lmer.REML = 5529.7  Scale est. = 0.66098    n = 2142

##
## Family: gaussian
## Link function: identity
##
## Formula:
## rt_diff_large_small_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1260063   0.3077940   0.409    0.682
## hormone_scr_ert_mean_z -0.0333926   0.0251146  -1.330    0.184
## interview_age   -0.0009739   0.0025665  -0.379    0.704
##
##
## R-sq.(adj) =  9.15e-05
## lmer.REML = 5558.9  Scale est. = 0.67172    n = 2142
```

2.20 Model: BIS-BAS-RR ~ Testosterone

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## bisbas_ss_basm_rr_z ~ hormone_scr_ert_mean_z + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.330045   0.321009   1.028    0.304
## hormone_scr_ert_mean_z -0.018668   0.024980  -0.747    0.455
## interview_age   -0.003113   0.002685  -1.160    0.246
##
##
## R-sq.(adj) =  0.000515
## lmer.REML = 7031.4  Scale est. = 0.70731    n = 2504
```

Males

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

```
## (Intercept)          0.255006   0.302870   0.842   0.3999
## hormone_scr_ert_mean_z 0.045069   0.024816   1.816   0.0695 .
## interview_age        -0.001467   0.002523  -0.581   0.5610
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00114
## lmer.REML = 7488.5  Scale est. = 0.70183   n = 2708
```

3—Int~Reward—

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_rvsnt_ant_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.052176    2.071394   1.956  0.05057 .
## accumbens_rvsnt_ant_z -0.043681    0.171115  -0.255  0.79854
## interview_age   -0.006634    0.015772  -0.421  0.67410
## race.ethnicity.5levelBlack  0.961315    0.887252   1.083  0.27873
## race.ethnicity.5levelMixed  2.510150    0.877107   2.862  0.00426 **
## race.ethnicity.5levelOther  2.570818    0.993973   2.586  0.00977 **
## race.ethnicity.5levelWhite  1.391087    0.825806   1.685  0.09224 .
## demo_race_hispanic1      0.551391    0.349161   1.579  0.11445
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00793
## lmer.REML = 12329  Scale est. = 11.287   n = 1999
```

Males

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

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

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

Females

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

Males

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

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

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

Females

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

Males

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



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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ accumbens_posvsneg_feedback_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.838930    2.065678   1.858  0.06325 .
## accumbens_posvsneg_feedback_z -0.046257    0.178948  -0.258  0.79605
## interview_age     -0.004964    0.015734  -0.315  0.75243
## race.ethnicity.5levelBlack  1.004141    0.883574   1.136  0.25590
## race.ethnicity.5levelMixed  2.419609    0.873629   2.770  0.00566 **
## race.ethnicity.5levelOther  2.610210    0.987916   2.642  0.00830 **
## race.ethnicity.5levelWhite  1.417874    0.823111   1.723  0.08512 .
## demo_race_hispanic1  0.471797    0.348750   1.353  0.17626
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00659
## lmer.REML = 12353  Scale est. = 11.268    n = 2005
```

Males

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

```
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.77475    1.99660   0.388 0.698032
## accumbens_posvsneg_feedback_z 0.32566    0.16284   2.000 0.045644 *
## interview_age      0.01477    0.01534   0.963 0.335823
## race.ethnicity.5levelBlack  1.51036    0.85866   1.759 0.078735 .
## race.ethnicity.5levelMixed  2.91146    0.85216   3.417 0.000647 ***
## race.ethnicity.5levelOther  3.04869    0.98188   3.105 0.001930 **
## race.ethnicity.5levelWhite  2.12718    0.80145   2.654 0.008013 **
## demo_race_hispanic1      0.06274    0.33218   0.189 0.850220
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00785
## lmer.REML = 12336 Scale est. = 17.742    n = 2021
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ caudate_posvsneg_feedback_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.174121    2.078905   2.008 0.04479 *
## caudate_posvsneg_feedback_z -0.178458    0.133986  -1.332 0.18304
## interview_age     -0.007524    0.015835  -0.475 0.63473
## race.ethnicity.5levelBlack  1.026575    0.888082   1.156 0.24784
## race.ethnicity.5levelMixed  2.438043    0.876042   2.783 0.00544 **
## race.ethnicity.5levelOther  2.443722    0.992035   2.463 0.01385 *
## race.ethnicity.5levelWhite  1.358837    0.825732   1.646 0.10000
## demo_race_hispanic1      0.542136    0.350534   1.547 0.12212
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0083
## lmer.REML = 12316 Scale est. = 11.382    n = 1997
```

Males

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

```
##      race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.421202    2.024330   0.702  0.48272
## caudate_posvsneg_feedback_z 0.118954    0.130857   0.909  0.36344
## interview_age      0.009903    0.015487   0.639  0.52261
## race.ethnicity.5levelBlack  1.426455    0.874856   1.631  0.10315
## race.ethnicity.5levelMixed  2.846507    0.869937   3.272  0.00109 **
## race.ethnicity.5levelOther  2.962154    0.995131   2.977  0.00295 **
## race.ethnicity.5levelWhite  2.094779    0.819002   2.558  0.01061 *
## demo_race_hispanic1        0.154159    0.335180   0.460  0.64562
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00595
## lmer.REML = 12389  Scale est. = 17.501    n = 2023
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ putamen_posvsneg_feedback_z + interview_age +
##      race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.937682    2.075294   1.897  0.05792 .
## putamen_posvsneg_feedback_z -0.091652    0.141345  -0.648  0.51678
## interview_age      -0.005695    0.015808  -0.360  0.71870
## race.ethnicity.5levelBlack  1.061865    0.888416   1.195  0.23214
## race.ethnicity.5levelMixed  2.459395    0.876016   2.807  0.00504 **
## race.ethnicity.5levelOther  2.506314    0.994597   2.520  0.01182 *
## race.ethnicity.5levelWhite  1.375676    0.826241   1.665  0.09607 .
## demo_race_hispanic1        0.556521    0.350406   1.588  0.11240
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00756
## lmer.REML = 12310  Scale est. = 11.343    n = 1996
```

Males

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

```
## cbcl_scr_syn_internal_r ~ putamen_posvsneg_feedback_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.05524    2.01873   0.523 0.601223
## putamen_posvsneg_feedback_z 0.14036    0.13237   1.060 0.289116
## interview_age      0.01249    0.01549   0.806 0.420296
## race.ethnicity.5levelBlack  1.46805    0.86859   1.690 0.091153 .
## race.ethnicity.5levelMixed  2.91149    0.86315   3.373 0.000757 ***
## race.ethnicity.5levelOther  2.98856    0.99153   3.014 0.002610 **
## race.ethnicity.5levelWhite  2.17694    0.81221   2.680 0.007416 **
## demo_race_hispanic1      0.08749    0.33699   0.260 0.795178
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00591
## lmer.REML = 12432 Scale est. = 17.729    n = 2028
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_rvsnt_ant_z + interview_age + race.ethnicity.5level +
##   demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.945689    2.088229   1.889 0.05897 .
## lOFC_rvsnt_ant_z  0.092356    0.206649   0.447 0.65498
## interview_age     -0.005135    0.015862  -0.324 0.74617
## race.ethnicity.5levelBlack  0.949446    0.895071   1.061 0.28893
## race.ethnicity.5levelMixed  2.410749    0.885797   2.722 0.00655 **
## race.ethnicity.5levelOther  2.446597    1.001979   2.442 0.01470 *
## race.ethnicity.5levelWhite  1.303526    0.834533   1.562 0.11845
## demo_race_hispanic1      0.566955    0.349537   1.622 0.10496
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0076
## lmer.REML = 12300 Scale est. = 11.614    n = 1994
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_rvsnt_ant_z + interview_age + race.ethnicity.5level +
```

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

Males

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

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   3.918460    2.071655   1.891  0.05871 .
## lOFC_posvsneg_feedback_z      -0.196960    0.231572  -0.851  0.39513
## interview_age                  -0.005545    0.015784  -0.351  0.72540
## race.ethnicity.5levelBlack    1.018741    0.883760   1.153  0.24916
## race.ethnicity.5levelMixed    2.433765    0.872756   2.789  0.00534 **
## race.ethnicity.5levelOther    2.741777    0.994022   2.758  0.00586 **
## race.ethnicity.5levelWhite    1.391187    0.822128   1.692  0.09077 .
## demo_race_hispanic1           0.465982    0.348214   1.338  0.18098
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00806
## lmer.REML = 12285  Scale est. = 11.271    n = 1994
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)          4.023520    2.074379    1.940  0.05257 .
## mOFC_posvsneg_feedback_z -0.167758    0.189547   -0.885  0.37624
## interview_age        -0.006339    0.015808   -0.401  0.68849
## race.ethnicity.5levelBlack 1.004855    0.886400    1.134  0.25708
## race.ethnicity.5levelMixed 2.433716    0.874753    2.782  0.00545 **
## race.ethnicity.5levelOther 2.575923    0.991115    2.599  0.00942 **
## race.ethnicity.5levelWhite 1.380283    0.823927    1.675  0.09404 .
## demo_race_hispanic1      0.518458    0.348645    1.487  0.13716
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00815
## lmer.REML = 12295  Scale est. = 11.469    n = 1994
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ lOFC_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.77055    1.99466   0.386 0.699312
## lOFC_posvsneg_feedback_z 0.04810    0.20526   0.234 0.814738
## interview_age   0.01541    0.01532   1.006 0.314405
## race.ethnicity.5levelBlack 1.46420    0.85984   1.703 0.088745 .
## race.ethnicity.5levelMixed 2.88778    0.85380   3.382 0.000733 ***
## race.ethnicity.5levelOther 2.84553    0.98502   2.889 0.003908 **
## race.ethnicity.5levelWhite 2.08630    0.80307   2.598 0.009447 **
## demo_race_hispanic1      0.06155    0.33289   0.185 0.853316
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00565
## lmer.REML = 12392  Scale est. = 17.111    n = 2029
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ mOFC_posvsneg_feedback_z + interview_age +
##    race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.80386    1.99379   0.403 0.686858
## mOFC_posvsneg_feedback_z 0.27553    0.17865   1.542 0.123160
## interview_age   0.01508    0.01531   0.985 0.324691
```

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ bisbas_ss_basm_rr + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.87599    1.89810   1.515  0.12984
## bisbas_ss_basm_rr -0.06648    0.04530  -1.468  0.14231
## interview_age      0.01054    0.01412   0.746  0.45561
## race.ethnicity.5levelBlack 0.57633    0.78656   0.733  0.46379
## race.ethnicity.5levelMixed 2.01387    0.78875   2.553  0.01073 *
## race.ethnicity.5levelOther 2.77250    0.90192   3.074  0.00213 **
## race.ethnicity.5levelWhite 1.38776    0.74259   1.869  0.06176 .
## demo_race_hispanic1 0.18709    0.31806   0.588  0.55645
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00746
## lmer.REML = 16337 Scale est. = 13.091 n = 2629
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ bisbas_ss_basm_rr + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.183626    1.837663   1.188  0.23483
## bisbas_ss_basm_rr 0.003817    0.044574   0.086  0.93177
```



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

3.10 Model: CBCL internalizing factor ~ MID Reaction Time

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_neutral_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.55400    1.98160   2.298  0.02165 *
## rt_diff_large_neutral_z  0.13920    0.12178   1.143  0.25318
## interview_age     -0.01062    0.01514  -0.702  0.48306
## race.ethnicity.5levelBlack  0.95841    0.84017   1.141  0.25411
## race.ethnicity.5levelMixed  2.34332    0.83412   2.809  0.00501 **
## race.ethnicity.5levelOther  2.81105    0.94816   2.965  0.00306 **
## race.ethnicity.5levelWhite  1.38364    0.78299   1.767  0.07735 .
## demo_race_hispanic1      0.49857    0.34170   1.459  0.14470
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00833
## lmer.REML = 13269  Scale est. = 11.8    n = 2153
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_small_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.464661    1.980676   2.254  0.02429 *
## rt_diff_large_small_z -0.123532    0.120640  -1.024  0.30597
## interview_age     -0.009608    0.015124  -0.635  0.52528
```

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

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_neutral_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.23765    1.93604   0.639  0.52271
## rt_diff_large_neutral_z 0.07626    0.12536   0.608  0.54304
## interview_age      0.01698    0.01481   1.146  0.25173
## race.ethnicity.5levelBlack 0.95348    0.84099   1.134  0.25702
## race.ethnicity.5levelMixed 2.18027    0.83793   2.602  0.00933 **
## race.ethnicity.5levelOther 2.00082    0.96151   2.081  0.03755 *
## race.ethnicity.5levelWhite 1.45145    0.79076   1.836  0.06656 .
## demo_race_hispanic1 0.16620    0.32281   0.515  0.60671
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.00317
## lmer.REML = 13877 Scale est. = 16.854 n = 2257
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ rt_diff_large_small_z + interview_age +
##   race.ethnicity.5level + demo_race_hispanic
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.28604    1.93561   0.664  0.5065
## rt_diff_large_small_z -0.07689    0.12414  -0.619  0.5357
## interview_age      0.01678    0.01481   1.133  0.2574
## race.ethnicity.5levelBlack 0.93933    0.84074   1.117  0.2640
## race.ethnicity.5levelMixed 2.15237    0.83755   2.570  0.0102 *
## race.ethnicity.5levelOther 1.96006    0.96117   2.039  0.0415 *
```

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

4—Int~Puberty x Reward—

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

Females

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

Males

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

```
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.110491   2.008771   0.553  0.58045
## PDS_score         0.740908   0.231386   3.202  0.00139 **
## accumbens_rvsnt_z -0.176926   0.431793  -0.410  0.68204
## race.ethnicity.5levelBlack 1.132855   0.868851   1.304  0.19243
## race.ethnicity.5levelMixed 2.813468   0.859400   3.274  0.00108 **
## race.ethnicity.5levelOther 2.805836   0.989336   2.836  0.00461 **
## race.ethnicity.5levelWhite 2.102584   0.807941   2.602  0.00933 **
## demo_race_hispanic1    0.031163   0.334900   0.093  0.92587
## interview_age         0.004686   0.015705   0.298  0.76543
## PDS_score:accumbens_rvsnt_z 0.028997   0.297822   0.097  0.92245
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00996
## lmer.REML = 12383 Scale est. = 17.312 n = 2024
```

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

Females

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

Males

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

```
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * caudate_rvs_n_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.330434    2.016643   0.660 0.509505
## PDS_score       0.764180    0.231367   3.303 0.000974 ***
## caudate_rvs_n_ant_z 0.289141    0.350447   0.825 0.409433
## race.ethnicity.5levelBlack 1.031591    0.888271   1.161 0.245639
## race.ethnicity.5levelMixed 2.698742    0.879861   3.067 0.002189 **
## race.ethnicity.5levelOther 2.786111    1.003964   2.775 0.005569 **
## race.ethnicity.5levelWhite 2.024026    0.829244   2.441 0.014740 *
## demo_race_hispanic1 0.053239    0.336319   0.158 0.874237
## interview_age    0.003358    0.015718   0.214 0.830824
## PDS_score:caudate_rvs_n_ant_z -0.302925    0.243097  -1.246 0.212869
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0105
## lmer.REML = 12373  Scale est. = 17.352    n = 2022
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * putamen_rvs_n_ant_z + race.ethnicity.5level +
##      demo_race_hispanic + interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.97477    2.07632   2.396 0.016669 *
## PDS_score       0.69413    0.17949   3.867 0.000114 ***
## putamen_rvs_n_ant_z -0.37583    0.32746  -1.148 0.251214
## race.ethnicity.5levelBlack 0.59070    0.88838   0.665 0.506182
## race.ethnicity.5levelMixed 2.32554    0.87167   2.668 0.007695 **
## race.ethnicity.5levelOther 2.29813    0.98931   2.323 0.020281 *
## race.ethnicity.5levelWhite 1.29941    0.81989   1.585 0.113158
## demo_race_hispanic1 0.50620    0.34697   1.459 0.144749
## interview_age    -0.02287    0.01628  -1.404 0.160369
## PDS_score:putamen_rvs_n_ant_z 0.18597    0.18035   1.031 0.302586
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.014
```

```
## lmer.REML = 12281 Scale est. = 11.319 n = 1995
```

Males

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * lOFC_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 ***
## lOFC_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:lOFC_rvsn_ant_z    0.03931    0.28333    0.139 0.889677
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0124
## lmer.REML = 12288  Scale est. = 11.562    n = 1994
```

Males

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * mOFC_rvsn_ant_z + race.ethnicity.5level +
##   demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.84149    2.09453   2.311  0.020908 *
## PDS_score         0.66802    0.17956   3.720  0.000204 ***
## mOFC_rvsn_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_rvsnt_ant_z 0.13133 0.23937 0.549 0.583311
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0134
## lmer.REML = 12296 Scale est. = 11.364 n = 1995
```

Males

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

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

Females

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



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

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * accumbens_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.974341    1.993967   0.489  0.625147
## PDS_score         0.709079    0.229247   3.093  0.002008
## accumbens_posvsneg_feedback_z  0.015265    0.446047   0.034  0.972703
## race.ethnicity.5levelBlack      1.234169    0.861883   1.432  0.152315
## race.ethnicity.5levelMixed      2.847060    0.850813   3.346  0.000834
## race.ethnicity.5levelOther      2.960141    0.980339   3.020  0.002564
## race.ethnicity.5levelWhite      2.098703    0.800058   2.623  0.008777
## demo_race_hispanic1      -0.001489    0.332586  -0.004  0.996427
## interview_age      0.005746    0.015588   0.369  0.712435
## PDS_score:accumbens_posvsneg_feedback_z  0.235992    0.304036   0.776  0.437724
##
## (Intercept)
```

```

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

```

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

Females

```

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

```

Males

```

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

```

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

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

Females

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

Males

```
##
```

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * lOFC_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.92052    2.08082   2.365 0.018140 *
## PDS_score       0.68518    0.17862   3.836 0.000129 ***
## lOFC_posvsneg_feedback_z -0.67670    0.57385  -1.179 0.238452
## race.ethnicity.5levelBlack    0.54472    0.88932   0.613 0.540267
## race.ethnicity.5levelMixed    2.21866    0.87231   2.543 0.011052 *
## race.ethnicity.5levelOther    2.47787    0.99339   2.494 0.012699 *
## race.ethnicity.5levelWhite    1.30039    0.82024   1.585 0.113041
## demo_race_hispanic1          0.41769    0.34743   1.202 0.229419
## interview_age      -0.02219    0.01632  -1.360 0.173911
## PDS_score:lOFC_posvsneg_feedback_z 0.26950    0.31121   0.866 0.386603
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## R-sq.(adj) = 0.0134
## lmer.REML = 12272 Scale est. = 11.19 n = 1994
```

Males

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * mOFC_posvsneg_feedback_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.04965   2.08298   2.424 0.01543 *
## PDS_score       0.68950   0.17888   3.855 0.00012 ***
## mOFC_posvsneg_feedback_z -0.69715   0.48406  -1.440 0.14996
## race.ethnicity.5levelBlack  0.53721   0.89106   0.603 0.54665
## race.ethnicity.5levelMixed  2.19349   0.87432   2.509 0.01219 *
## race.ethnicity.5levelOther  2.30312   0.98997   2.326 0.02009 *
## race.ethnicity.5levelWhite  1.28148   0.82167   1.560 0.11901
```

```
## demo_race_hispanic1          0.46194    0.34777    1.328  0.18423
## interview_age                 -0.02318    0.01634   -1.419  0.15610
## PDS_score:mOFC_posvsneg_feedback_z  0.30275    0.26566    1.140  0.25459
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0142
## lmer.REML = 12281  Scale est. = 11.435    n = 1994
```

Males

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * bisbas_ss_basm_rr + race.ethnicity.5level +
##   demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.191763   2.099766   1.044 0.29667
## PDS_score       1.574106   0.551603   2.854 0.00436 **
```

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

Males

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

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

Females

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

```
##      race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      5.501255    1.992802   2.761 0.005819 **
## PDS_score         0.641957    0.172929   3.712 0.000211 ***
## rt_diff_large_neutral_z 0.154540    0.311198   0.497 0.619525
## race.ethnicity.5levelBlack 0.560716    0.845384   0.663 0.507230
## race.ethnicity.5levelMixed 2.155255    0.833294   2.586 0.009763 **
## race.ethnicity.5levelOther 2.598824    0.947143   2.744 0.006123 **
## race.ethnicity.5levelWhite 1.320738    0.781113   1.691 0.091013 .
## demo_race_hispanic1 0.456433    0.341115   1.338 0.181018
## interview_age     -0.026474    0.015690  -1.687 0.091696 .
## PDS_score:rt_diff_large_neutral_z -0.008305    0.171296  -0.048 0.961335
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0132
## lmer.REML = 13258 Scale est. = 11.823    n = 2153
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * rt_diff_large_neutral_z +
##      race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.437100    1.933083   0.743 0.45730
## PDS_score         0.624857    0.221216   2.825 0.00477 **
## rt_diff_large_neutral_z 0.605150    0.344894   1.755 0.07946 .
## race.ethnicity.5levelBlack 0.739558    0.843849   0.876 0.38090
## race.ethnicity.5levelMixed 2.156381    0.836600   2.578 0.01001 *
## race.ethnicity.5levelOther 2.032814    0.962054   2.113 0.03471 *
## race.ethnicity.5levelWhite 1.469532    0.789459   1.861 0.06281 .
## demo_race_hispanic1 0.100016    0.322811   0.310 0.75672
## interview_age     0.008459    0.015042   0.562 0.57393
## PDS_score:rt_diff_large_neutral_z -0.382233    0.238948  -1.600 0.10982
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0071
## lmer.REML = 13868 Scale est. = 16.958    n = 2257
```


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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * rt_diff_large_small_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.41915    1.99084   2.722 0.006540 **
## PDS_score       0.62916    0.17250   3.647 0.000271 ***
## rt_diff_large_small_z -0.54782    0.29953  -1.829 0.067548 .
## race.ethnicity.5levelBlack 0.56487    0.84371   0.670 0.503245
## race.ethnicity.5levelMixed 2.14230    0.83251   2.573 0.010139 *
## race.ethnicity.5levelOther 2.55705    0.94673   2.701 0.006969 **
## race.ethnicity.5levelWhite 1.29990    0.78025   1.666 0.095859 .
## demo_race_hispanic1 0.45983    0.34088   1.349 0.177498
## interview_age   -0.02539    0.01567  -1.621 0.105253
## PDS_score:rt_diff_large_small_z 0.25824    0.16474   1.568 0.117135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0143
## lmer.REML = 13256 Scale est. = 11.79    n = 2153
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score * rt_diff_large_small_z +
##   race.ethnicity.5level + demo_race_hispanic + interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.462262    1.934052   0.756 0.44969
## PDS_score       0.628312    0.221085   2.842 0.00452 **
## rt_diff_large_small_z 0.090408    0.345473   0.262 0.79358
## race.ethnicity.5levelBlack 0.694926    0.844009   0.823 0.41039
## race.ethnicity.5levelMixed 2.103226    0.836744   2.514 0.01202 *
## race.ethnicity.5levelOther 1.902684    0.960826   1.980 0.04780 *
## race.ethnicity.5levelWhite 1.409154    0.789449   1.785 0.07440 .
## demo_race_hispanic1 0.097283    0.323145   0.301 0.76340
## interview_age    0.008768    0.015050   0.583 0.56023
## PDS_score:rt_diff_large_small_z -0.119670    0.241539  -0.495 0.62033
## ---
```

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

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      accumbens_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 0.663095
## 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_rvs_n_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0115
## lmer.REML = 11518  Scale est. = 10.565    n = 1870
```

Males

```
##
```

```

## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      accumbens_rvsnt_ant_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.827482   2.101594   0.394  0.69382
## PDS_score         0.803710   0.247925   3.242  0.00121
## hormone_scr_ert_mean -0.001469  0.008279  -0.177  0.85920
## accumbens_rvsnt_ant_z -0.223974  0.362232  -0.618  0.53644
## race.ethnicity.5levelBlack  1.003326  0.916447   1.095  0.27375
## race.ethnicity.5levelMixed  2.772588  0.901195   3.077  0.00212
## race.ethnicity.5levelOther  2.732707  1.034747   2.641  0.00834
## race.ethnicity.5levelWhite  2.068040  0.847370   2.441  0.01476
## demo_race_hispanic1  0.093109  0.347147   0.268  0.78857
## interview_age      0.007231  0.016641   0.435  0.66395
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z  0.003830  0.010773   0.355  0.72227
##
## (Intercept)
## PDS_score          **
## hormone_scr_ert_mean
## accumbens_rvsnt_ant_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed      **
## race.ethnicity.5levelOther      **
## race.ethnicity.5levelWhite      *
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:accumbens_rvsnt_ant_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00989
## lmer.REML = 11513 Scale est. = 17.508    n = 1873

```

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

Females

```

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

```

```
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      4.534882   2.1219447   2.137 0.032717
## PDS_score         0.6845890   0.1914868   3.575 0.000359
## hormone_scr_ert_mean 0.0028676   0.0081083   0.354 0.723629
## caudate_rvsnt_z   -0.0035716   0.3299659  -0.011 0.991365
## race.ethnicity.5levelBlack 0.2633481   0.8995029   0.293 0.769730
## race.ethnicity.5levelMixed 2.1525889   0.8777123   2.452 0.014278
## race.ethnicity.5levelOther 2.2184539   0.9953510   2.229 0.025945
## race.ethnicity.5levelWhite 1.3332409   0.8235547   1.619 0.105642
## demo_race_hispanic1 0.3429821   0.3576367   0.959 0.337672
## interview_age     -0.0193397   0.0169371  -1.142 0.253662
## hormone_scr_ert_mean:caudate_rvsnt_z 0.0001989   0.0087533   0.023 0.981876
##
## (Intercept)      *
## PDS_score         ***
## hormone_scr_ert_mean
## caudate_rvsnt_z
## race.ethnicity.5levelBlack
## race.ethnicity.5levelMixed      *
## race.ethnicity.5levelOther      *
## race.ethnicity.5levelWhite
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:caudate_rvsnt_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0113
## lmer.REML = 11506 Scale est. = 10.618    n = 1868
```

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   caudate_rvsnt_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.085264   2.112341   0.514 0.607472
## PDS_score         0.817312   0.247909   3.297 0.000996
## hormone_scr_ert_mean -0.001257   0.008331  -0.151 0.880078
## caudate_rvsnt_z     0.210667   0.287271   0.733 0.463445
## race.ethnicity.5levelBlack 0.898481   0.937823   0.958 0.338162
## race.ethnicity.5levelMixed 2.713893   0.923809   2.938 0.003347
## race.ethnicity.5levelOther 2.659580   1.052711   2.526 0.011606
## race.ethnicity.5levelWhite 1.977981   0.871688   2.269 0.023374
## demo_race_hispanic1 0.092823   0.349225   0.266 0.790425
```

```
## interview_age 0.005767 0.016687 0.346 0.729694
## hormone_scr_ert_mean:caudate_rvsnt_ant_z -0.009248 0.008064 -1.147 0.251597
##
## (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) = 0.0103
## lmer.REML = 11507 Scale est. = 17.744 n = 1871
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
## putamen_rvsnt_ant_z + race.ethnicity.5level + demo_race_hispanic +
## interview_age
##
## Parametric coefficients:
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 4.341820 2.117114 2.051 0.040425
## PDS_score 0.685162 0.191490 3.578 0.000355
## hormone_scr_ert_mean 0.001752 0.008077 0.217 0.828324
## putamen_rvsnt_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_rvsnt_ant_z 0.004550 0.008692 0.523 0.600715
##
## (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_z
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0114
## lmer.REML = 11482  Scale est. = 10.569    n = 1866
```

Males

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

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

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

Females

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

Males

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

```

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

```

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

Females

```

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

```



```

## hormone_scr_ert_mean                2.420e-03  8.112e-03   0.298
## caudate_posvsneg_feedback_z        -1.997e-01  3.265e-01  -0.612
## race.ethnicity.5levelBlack          2.948e-01  8.991e-01   0.328
## race.ethnicity.5levelMixed          2.101e+00  8.768e-01   2.396
## race.ethnicity.5levelOther          2.103e+00  9.960e-01   2.112
## race.ethnicity.5levelWhite          1.291e+00  8.229e-01   1.569
## demo_race_hispanic1                3.428e-01  3.598e-01   0.953
## interview_age                      -1.950e-02  1.697e-02  -1.149
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z -8.058e-06  8.468e-03  -0.001
##                                     Pr(>|t|)
## (Intercept)                        0.032269 *
## PDS_score                          0.000264 ***
## hormone_scr_ert_mean                0.765486
## caudate_posvsneg_feedback_z        0.540722
## race.ethnicity.5levelBlack          0.743000
## race.ethnicity.5levelMixed          0.016683 *
## race.ethnicity.5levelOther          0.034831 *
## race.ethnicity.5levelWhite          0.116767
## demo_race_hispanic1                0.340801
## interview_age                      0.250598
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.999241
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0122
## lmer.REML = 11483  Scale est. = 10.562    n = 1865

```

Males

```

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   caudate_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##                                     Estimate Std. Error t value
## (Intercept)                    1.3853505   2.1141365   0.655
## PDS_score                      0.8405454   0.2482247   3.386
## hormone_scr_ert_mean           -0.0003595   0.0083567  -0.043
## caudate_posvsneg_feedback_z    0.0394484   0.3248035   0.121
## race.ethnicity.5levelBlack     0.9893125   0.9257562   1.069
## race.ethnicity.5levelMixed     2.7620204   0.9104401   3.034
## race.ethnicity.5levelOther     2.7653144   1.0394684   2.660
## race.ethnicity.5levelWhite     2.0516687   0.8573196   2.393
## demo_race_hispanic1            0.1355263   0.3485331   0.389
## interview_age                  0.0018915   0.0166800   0.113
## hormone_scr_ert_mean:caudate_posvsneg_feedback_z 0.0037307   0.0092346   0.404
##                                     Pr(>|t|)
## (Intercept)                    0.512369

```

```

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

```

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

Females

```

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

```

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

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##      putamen_posvsneg_feedback_z + race.ethnicity.5level + demo_race_hispanic +
##      interview_age
##
## Parametric coefficients:
##
##              Estimate Std. Error t value
## (Intercept)  0.9611155  2.1101773   0.455
## PDS_score    0.8176842  0.2484107   3.292
## hormone_scr_ert_mean 0.0002681  0.0083787   0.032
## putamen_posvsneg_feedback_z 0.3306721  0.3251871   1.017
## race.ethnicity.5levelBlack 1.0236441  0.9185222   1.114
## race.ethnicity.5levelMixed 2.8148709  0.9028527   3.118
## race.ethnicity.5levelOther 2.8319892  1.0337642   2.739
## race.ethnicity.5levelWhite 2.1176635  0.8496222   2.492
## demo_race_hispanic1 0.0681445  0.3504727   0.194
## interview_age 0.0051637  0.0166850   0.309
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z -0.0049109  0.0091615  -0.536
##
##              Pr(>|t|)
## (Intercept)  0.64883
## PDS_score    0.00101 **
## hormone_scr_ert_mean 0.97447
## putamen_posvsneg_feedback_z 0.30935
## race.ethnicity.5levelBlack 0.26523
## race.ethnicity.5levelMixed 0.00185 **
## race.ethnicity.5levelOther 0.00621 **
## race.ethnicity.5levelWhite 0.01277 *
## demo_race_hispanic1 0.84586
## interview_age 0.75699
## hormone_scr_ert_mean:putamen_posvsneg_feedback_z 0.59199
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0101
## lmer.REML = 11552  Scale est. = 17.82    n = 1877
```



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

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

Females

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

Males

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

```
## Parametric coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3794183   2.0930053   0.181  0.85617
## PDS_score         0.7418269   0.2477609   2.994  0.00279 **
## hormone_scr_ert_mean -0.0047195   0.0082694  -0.571  0.56826
## mOFC_rvs_n_ant_z   0.2166667   0.3858311   0.562  0.57448
## race.ethnicity.5levelBlack 1.0066067   0.9112426   1.105  0.26945
## race.ethnicity.5levelMixed 2.6544268   0.8948998   2.966  0.00305 **
## race.ethnicity.5levelOther 2.6516682   1.0247281   2.588  0.00974 **
## race.ethnicity.5levelWhite 1.9777066   0.8411090   2.351  0.01881 *
## demo_race_hispanic1  0.0431677   0.3460332   0.125  0.90073
## interview_age      0.0130179   0.0165828   0.785  0.43254
## hormone_scr_ert_mean:mOFC_rvs_n_ant_z -0.0003209   0.0108689  -0.030  0.97645
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00947
## lmer.REML = 11431 Scale est. = 17.29    n = 1864
```

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

Females

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

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

Males

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

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

Females

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

Males

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



```

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

```

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

Females

```

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

```

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

Males

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##     bisbas_ss_basm_rr + race.ethnicity.5level + demo_race_hispanic +
##     interview_age
##
## Parametric coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.9448720   2.0990033    1.403   0.1607
## PDS_score       0.9727679   0.2130504    4.566 5.2e-06
## hormone_scr_ert_mean -0.0077391   0.0275009   -0.281   0.7784
## bisbas_ss_basm_rr  -0.0374799   0.1024260   -0.366   0.7145
## race.ethnicity.5levelBlack    1.2176099   0.7861775    1.549   0.1216
## race.ethnicity.5levelMixed    1.9522652   0.7835021    2.492   0.0128
## race.ethnicity.5levelOther    1.6180798   0.9000651    1.798   0.0723
## race.ethnicity.5levelWhite    1.4443559   0.7343462    1.967   0.0493
## demo_race_hispanic1    0.3039554   0.3133667    0.970   0.3322
## interview_age    -0.0030757   0.0148819   -0.207   0.8363
## hormone_scr_ert_mean:bisbas_ss_basm_rr 0.0007827   0.0029404    0.266   0.7901
##
## (Intercept)
## PDS_score                       ***
## hormone_scr_ert_mean
## bisbas_ss_basm_rr
## race.ethnicity.5levelBlack
```

```
## race.ethnicity.5levelMixed          *
## race.ethnicity.5levelOther          .
## race.ethnicity.5levelWhite          *
## demo_race_hispanic1
## interview_age
## hormone_scr_ert_mean:bisbas_ss_basm_rr
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.00648
## lmer.REML = 16521  Scale est. = 16.034    n = 2641
```

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

Females

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   rt_diff_large_neutral_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##                                Estimate Std. Error t value
## (Intercept)                   4.907852   2.030911   2.417
## PDS_score                     0.640865   0.184675   3.470
## hormone_scr_ert_mean          0.002747   0.007808   0.352
## rt_diff_large_neutral_z      -0.234637   0.297943  -0.788
## race.ethnicity.5levelBlack    0.234371   0.848919   0.276
## race.ethnicity.5levelMixed    2.018688   0.835051   2.417
## race.ethnicity.5levelOther    2.518939   0.951958   2.646
## race.ethnicity.5levelWhite    1.333646   0.780222   1.709
## demo_race_hispanic1          0.310120   0.350440   0.885
## interview_age                -0.021805   0.016262  -1.341
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.010522   0.007540   1.395
##                                Pr(>|t|)
## (Intercept)                   0.015756 *
## PDS_score                     0.000531 ***
## hormone_scr_ert_mean          0.725032
## rt_diff_large_neutral_z      0.431069
## race.ethnicity.5levelBlack    0.782514
## race.ethnicity.5levelMixed    0.015719 *
## race.ethnicity.5levelOther    0.008207 **
## race.ethnicity.5levelWhite    0.087547 .
## demo_race_hispanic1          0.376293
## interview_age                 0.180118
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.163025
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

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

Males

##
## Family: gaussian
## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
## rt_diff_large_neutral_z + race.ethnicity.5level + demo_race_hispanic +
## interview_age
##
## Parametric coefficients:
##
## Estimate Std. Error t value
## (Intercept) 1.417e+00 2.019e+00 0.702
## PDS_score 7.079e-01 2.365e-01 2.994
## hormone_scr_ert_mean 3.882e-05 7.949e-03 0.005
## rt_diff_large_neutral_z 4.941e-01 2.912e-01 1.697
## race.ethnicity.5levelBlack 6.221e-01 8.861e-01 0.702
## race.ethnicity.5levelMixed 2.099e+00 8.748e-01 2.399
## race.ethnicity.5levelOther 1.774e+00 1.003e+00 1.769
## race.ethnicity.5levelWhite 1.389e+00 8.256e-01 1.683
## demo_race_hispanic1 1.517e-01 3.361e-01 0.451
## interview_age 8.579e-03 1.592e-02 0.539
## hormone_scr_ert_mean:rt_diff_large_neutral_z -9.990e-03 8.000e-03 -1.249
##
## Pr(>|t|)
## (Intercept) 0.48275
## PDS_score 0.00279 **
## hormone_scr_ert_mean 0.99610
## rt_diff_large_neutral_z 0.08994 .
## race.ethnicity.5levelBlack 0.48277
## race.ethnicity.5levelMixed 0.01651 *
## race.ethnicity.5levelOther 0.07711 .
## race.ethnicity.5levelWhite 0.09253 .
## demo_race_hispanic1 0.65185
## interview_age 0.58996
## hormone_scr_ert_mean:rt_diff_large_neutral_z 0.21194
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) = 0.0066
## lmer.REML = 12948 Scale est. = 17.517 n = 2097
```

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

Females

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

```

## Link function: identity
##
## Formula:
## cbcl_scr_syn_internal_r ~ PDS_score + hormone_scr_ert_mean *
##   rt_diff_large_small_z + race.ethnicity.5level + demo_race_hispanic +
##   interview_age
##
## Parametric coefficients:
##
##               Estimate Std. Error t value
## (Intercept)      4.831194   2.029794   2.380
## PDS_score         0.653073   0.184699   3.536
## hormone_scr_ert_mean 0.001929  0.007810   0.247
## rt_diff_large_small_z -0.398204  0.291988  -1.364
## race.ethnicity.5levelBlack 0.219699  0.848951   0.259
## race.ethnicity.5levelMixed 2.006919  0.835252   2.403
## race.ethnicity.5levelOther 2.487240  0.952491   2.611
## race.ethnicity.5levelWhite 1.329151  0.780631   1.703
## demo_race_hispanic1 0.281757  0.350482   0.804
## interview_age    -0.020947  0.016244  -1.289
## hormone_scr_ert_mean:rt_diff_large_small_z 0.007625  0.007555   1.009
##
##               Pr(>|t|)
## (Intercept)      0.017399 *
## PDS_score         0.000416 ***
## hormone_scr_ert_mean 0.804974
## rt_diff_large_small_z 0.172793
## race.ethnicity.5levelBlack 0.795825
## race.ethnicity.5levelMixed 0.016362 *
## race.ethnicity.5levelOther 0.009087 **
## race.ethnicity.5levelWhite 0.088786 .
## demo_race_hispanic1 0.421543
## interview_age     0.197374
## hormone_scr_ert_mean:rt_diff_large_small_z 0.312973
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.0132
## lmer.REML = 12399  Scale est. = 11.209    n = 2014

```

Males

```

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

```

```

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

```