Maternal Response to Positive Affect Moderates the Impact of Familial Risk for Depression on Ventral Striatal Response to Winning Reward in 6- to 8-Year-Old Children

Supplemental Information

Participants

Originally, 66 participants were enrolled in the study, but 5 participants did not complete the fMRI scan (n=3 child refusal, n=1 parent refusal, and n=1 scanning contraindication). Of the 61 who completed the entire assessment including the fMRI, n=12 had excessive movement (see *fMRI Quality Control*) for a final sample of n=49 (80% of participants scanned). Children with usable data (n=49; 25 low risk, 24 high risk) did not differ from children removed from the study on child age or mother age (Ms=6.88 years and 6.67 years, respectively, p=.39; Ms=38.14 years and 36.64 years respectively, p=.42), risk status (χ^2 = .00, p=1.00, 6 low risk, 6 high risk removed), or sex (χ^2= 1.50, p=.34, 8 boys, 4 girls removed).
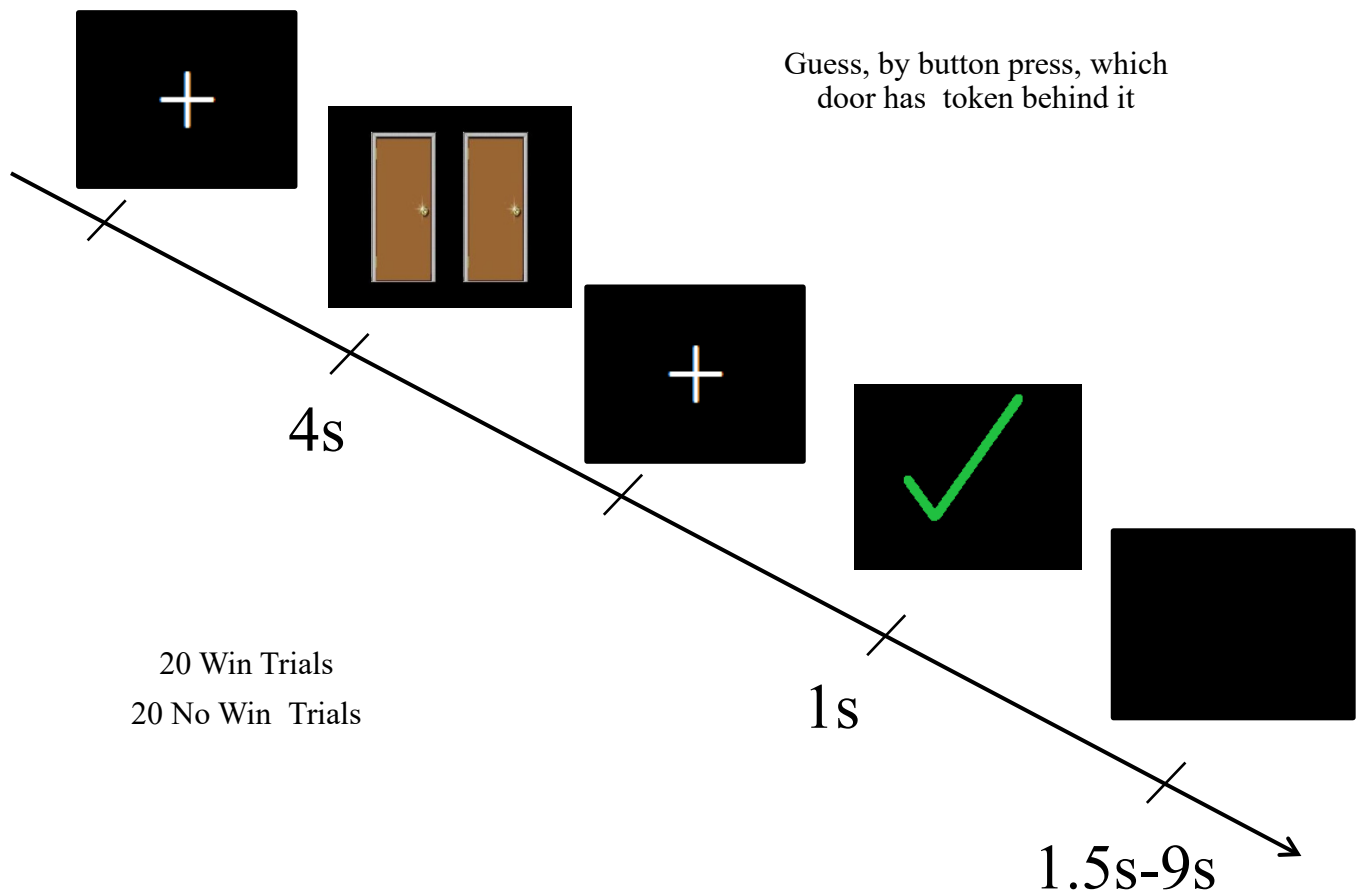
fMRI Quality Control

First, participants were ensured to have a maximum movement <4mm in each plane for analyzed contrasts, $\geq$ 80% behavioral responding in scanner (i.e., button press within 4 seconds for a given trial), and $\geq$80% signal coverage in ventral regions (e.g., VS) where signal loss can be common. Further quality control measures revealed that of the 49 participants who met these criteria, 37 had maximum movement less than 2mm in each plane for analyzed contrasts.[a] To control for participant movement and non-task related brain activity, motion parameters from the realignment phase were entered as covariates in first level models as were estimates of physiologic fluctuations (i.e., BOLD signal) within cerebrospinal fluid

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[a] When we limited our within-sample *t*-test to the 37 participants with <2mm movement, our ventral striatal cluster remained statistically significant (159 voxels, [2, 22, -4], t=6.01, pFWE=.028). Subsequently, regression models in which we estimated the interactive effect of risk and maternal behavior on child reward response using only the 37 participants with <2mm movement produced substantively similar results for the interactive effects (although findings were no longer statistically significant; ps=.07-.10).

and white matter, using CompCor.[1] Use of CompCor significantly increases the number of activated

voxels as compared to no correction. Use of CompCor also mitigates motion artifact,[2] allowing for

retention of participants with more movement (i.e., between 2-4mm). This process ensured a balance of

retaining as many participants as feasible while still appropriately handling motion in a young child

sample.

Supplemental Figure S1. Doors Task Design

Guess, by button press, which door has token behind it

4s

20 Win Trials
20 No Win Trials

1s

1.5s-9s

Supplemental References

1. Behzadi, Y., Restom, K., Liau, J., & Liu, T.T. (2007). A component based noise correction method (CompCor) for BOLD and perfusion based fMRI. *Neuroimage, 37*, 90-101.

2. Ciric, R. Rosen, A.f., Erus, G., Cieslak, M., Adebimpe, A., Cook, P.A., Bassett, D.S., Davatzikos, C., Wolf, D.H., & Satterthwaite, T.D. (2018). Mitigating head motion artifact in functional connectivity MRI. *Nature protocols, 13*, 2801-2826.