



# Early Deprivation, BDNF Genotype and Executive Function in Post-Institutionalized Youth



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## Introduction

- Post-institutionalized youth experience mild to severe deprivation in the form of inadequate social and physical attention while in the institution (Rutter, 1981).
- This can potentially result in physical, behavioral or cognitive delays which persist to a greater or lesser extent following removal from institutional conditions (Gunnar, Bruce, and Grotevant, 2000).
- Not all children experiencing early deprivation show adverse outcomes. Some youth appear resilient in the face of early deprivation, while others show vulnerabilities to these early stressors.
- One's genetic inheritance and age at adoption may moderate the relationship between early experience and later cognitive performance.
- In rodent studies, the presence of a Met allele (any Met) polymorphism of the brain derived neurotrophic factor (BDNF) gene is associated with reduced availability of BDNF, and has been identified as a potential risk allele for altered learning and memory (Korte et al., 1995; Chen et al., 2006).
- The current study examines the impact of early deprivation and BDNF genotype on cognitive control in 12- to 14- year olds with a history of orphanage care.

## Hypothesis

- Individuals with the Val66Val BDNF genotype will have greater accuracy scores on a measure of cognitive control than individuals with either the Val66Met or the Met66Met genotype.

## Participants

Genotype	Age at Adoption (range)	Total (n)
Val/Val	< = 12 months (5 months – 12 months)	31
	> 12 months (13 months – 108 months)	36
Any Met	< = 12 months (4 months – 12 months)	34
	> 12 months (13 months – 42 months)	27



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## Set-Shifting/Cognitive Control Task

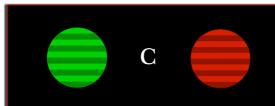
- This task requires participants to shift between two rules: the motion rule and the color rule.
- Easy trials repeat the same rule for multiple trials and present no conflict between rules.
- Difficult trials switch between rules and *distracting* elements of the opposite rule are enhanced.

**Motion Rule:** Choose the circle with upward moving lines.



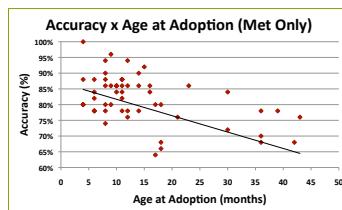
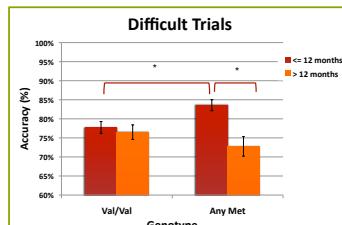
- The lines inside each of the circles are moving either up or down.
- The line thickness varies to create easier or harder trials.

**Color Rule:** Choose the red circle.



- Each trial has both a green and red circle.
- The color saturation varies to create easier or harder trials.

## Results



- Group differences are observed only on difficult trials.

- Earlier adopted Met carriers perform better than:
  - Earlier adopted Val/Val carriers
  - Later adopted Met carriers

- For Met allele carriers there is a significant negative correlation between accuracy and age at adoption ( $p = -.467, p = .000$ ).

- Age at adoption does not correlate with performance for individuals with the Val/Val genotype.

## Selected References

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