

## ABSTRACT

Impulsivity and difficulties with emotion regulation are hallmarks of fetal alcohol spectrum disorders (FASD), and affected children are at high risk for the development of antisocial behavior. We examined the ability of school-aged children with FASD to resist touching a desired but prohibited object as an index of regulation and moral internalization, and considered key child (e.g., inhibitory control, emotion regulation) and environmental (maternal regulatory scaffolding) correlates. The sample included 19 culturally diverse children between the ages of 4 and 9 years, who met the criteria for FASD. Cognitive inhibitory control was measured through direct neuropsychological testing. Children's emotion regulation, maternal scaffolding, and rule violation were independently rated during structured laboratory tasks. Results indicated that caregiver scaffolding and child self-regulation each uniquely predicted children's ability to resist the rule violation, and that this combination accounted for approximately half the variance in the children's ability to delay.

## INTRODUCTION

Fetal alcohol spectrum disorder (FASD) is an umbrella term used to characterize children who exhibit neurological problems related to prenatal exposure to alcohol (Astley, 2004). FASD includes not only fetal alcohol syndrome (FAS), but also conditions referred to as partial FAS, fetal alcohol effects (FAE), alcohol-related neurodevelopmental disorder (ARND), and alcohol-related birth defects (ARBD). FASD is estimated to affect approximately 1 in 100 children (Sampson, et al., 1997).

Impulsivity and difficulties with emotion regulation are hallmarks of fetal alcohol spectrum disorders (FASD), and affected children are at high risk for the development of antisocial behavior and substance abuse (Streissguth, 2007; Schonfeld et al., 2006; Walthall, O'Connor, & Paley, 2008). Self-regulation and responses from important caregivers have been found to contribute to moral internalization and behavioral functioning in non-FASD populations (Baker et al., 2007; Kochanska, 1997; Rubin et al., 1995; Rydell et al., 2003). We examined the ability of school-aged children with FASD to resist touching a desired but prohibited object as an index of self-regulation and moral internalization, and considered key child and environmental correlates.

## RESEARCH QUESTION

- How are certain child (inhibitory control, emotion regulation) and environmental (maternal scaffolding) factors related to the ability of children with FASD to resist touching a prohibited object during a structured laboratory paradigm?

## METHOD

### Participants

The sample consisted of 19 culturally diverse, 4 to 9-year-old children ( $M = 6.23$ ,  $SD = 1.42$ ) with FASD (15 males, 14 children living in adopted homes). Mothers ( $M_{age} = 40.59$ ,  $SD = 8.89$ ) were primarily married (84%) and college educated (74%). Annual household income ranged from less than \$15,000 to more than \$95,000 ( $M = \$50,000$  to \$70,000). Mean child IQ was 85.05 ( $SD = 14.55$ ). Family income and child IQ, gender, and adoptive status were unrelated to the criterion variable so were not controlled.



### Procedures & Measurement

Mothers participated in a brief phone screening and completed questionnaires. Mothers and children participated in a laboratory visit performed at either the University of Wisconsin Waisman Center, California State University-Fullerton, or in the families' homes. The laboratory visit included direct assessment of the children and participation by children in a number of frustrating tasks, both with and without their mothers, including a delay of gratification task, a locked-box frustration task, and two parent-child visual-spatial problem solving tasks.

### Diagnostic Assignment:

- Approximately half ( $n = 10$ ) of the children held previous diagnoses of FASD from a health professional. Relevant information for all children was obtained from maternal interview, record review, and a physical evaluation by a clinical geneticist and/or a clinical psychologist trained in the Astley 4-point diagnostic system. Of the 19 children in the study, six were considered to have met the criteria for FAS, and the remainder met the criteria for FASD (codes *E* through *I* of the Astley system).

### Child Factors

- **IQ:** Child IQ was indexed by the Abbreviated IQ Battery of the Stanford Binet-5, conducted by a child clinical psychologist.
- **Inhibitory Control:** Children's inhibitory control was measured through the commission error score of the computerized Test of Variables of Attention (T.O.V.A.) neuropsychological assessment.
- **Emotion Regulation:** Children's emotion regulation abilities were rated from a child-alone "locked box" frustration task, using a reliable and valid rating system (Baker, Fenning, Crnic, Baker, & Blacher, 2007). Child *dysregulation* was initially coded, and ratings were reversed for ease of interpretation. Dysregulation ratings took into consideration the appropriateness, frequency, and intensity of emotional expressions, as well as the lability and soothability of the child. Children were rated on a 5-point scale ranging from 0 (*no dysregulation*) to 4 (*substantial dysregulation*).

### Maternal Scaffolding

- Maternal scaffolding was rated from two dyadic problem-solving tasks using the emotional scaffolding scale of the *Maternal Scaffolding Rating System* (Hoffman et al., 2005; Baker et al., 2007). Mothers were rated on a scale ranging from 1 to 5 based upon their ability to provide emotional support and guidance to their children. Ratings considered behaviors such as sensitivity, explicit emotion coaching, acceptance of child efforts, praise, and other attempts to contribute to the children's feelings of confidence and accomplishment.

### Latency to Rule Violation

- Children's ability to resist touching the prohibited object was measured using a standard prohibition task in which the children were presented with desirable toys and told not to touch them until the experimenter and mother returned (Baker et al., 2007). Children's ability to resist rule violation was indexed by the time elapsed prior to touching the prohibited object.
- Emotion regulation, maternal scaffolding, and time to rule violation were rated by separate teams, blind to the children's ratings on other variables.

# Correlates of Rule Violation in Children with Fetal Alcohol Spectrum Disorders

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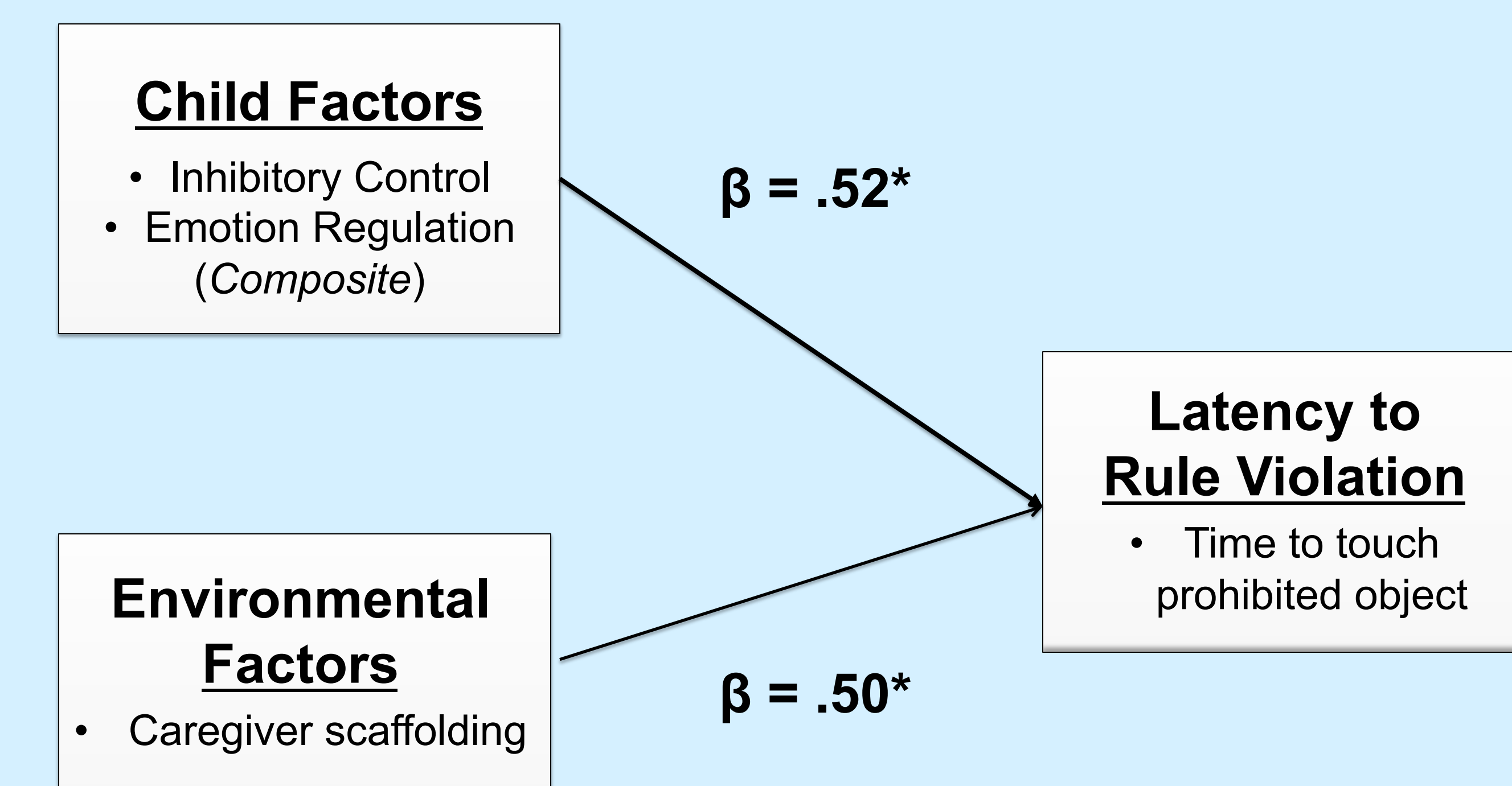
## RESULTS

### Correlational Analyses

- Both maternal scaffolding and children's independent emotion regulation skills were related to latency to rule violation as per bivariate correlations
- Children's inhibitory control was not related to rule violation as per bivariate correlations; however, a significant relation emerged once maternal scaffolding was controlled,  $pr = .49$ ,  $p < .05$ .

	1.	2.	3.
1. Child Inhibitory Control	--		
2. Child Emotion Regulation	.56*	--	
3. Maternal Scaffolding	-.24	.14	--
4. Latency to Rule Violation	.31	.56*	.47*

### Regression Analysis



- Of note, the above model accounted for almost half of the variance related to the children's ability to resist rule violation,  $R^2 = .48$ .

## CONCLUSIONS

- Findings suggest that the ability of children with FASD to resist rule violation is likely multi-determined by a combination of neurological, emotional, and environmental factors.
- Although replication with a larger sample size is required, findings suggest that both children's self-regulatory abilities and caregivers' ability to assist their children during emotional events may make independent contributions to rule compliance and may therefore each represent useful avenues for intervention.