Published in final edited form as:
Cogn Emot. 2013 December ; 27(8): . doi:10.1080/02699931.2013.789792.

The Interactive Roles of Parenting, Emotion Regulation and Executive Functioning in Moral Reasoning during Middle Childhood

J. Benjamin Hinnant[a], **Jackie A. Nelson**[b], **Marion O'Brien**[c], **Susan P. Keane**[c], and **Susan D. Calkins**[c]

[a]The Catholic University of America

[b]The University of Texas at Dallas

[c]The University of North Carolina at Greensboro

Abstract

We examined mother-child cooperative behavior, children's emotion regulation and executive function, as well as combinations of these factors, as predictors of moral reasoning in 89 10-year-old children. Dyadic cooperation was coded from videotaped observations of laboratory puzzle and speech tasks. Emotion regulation was derived from maternal report, and executive functioning was assessed with the Tower of London task. Moral reasoning was coded during mother-child conversations about morally ambiguous, peer-conflict situations. Two significant interactions indicated that children from more cooperative dyads who also had higher executive function skills had higher moral reasoning scores than other children, and children lower in both emotion regulation and executive function had lower moral reasoning scores than other children. The results contribute to the literature on the multiple and interactive levels of influence on moral reasoning in childhood.

Keywords

parent-child; cooperative behavior; executive functioning; emotion regulation; moral reasoning

The study of moral reasoning in childhood includes the study of how children first learn, interpret, and internalize moral directives. Moral reasoning is commonly studied by evoking responses to situations in which an individual's needs or desires are in conflict with another, and in which "correct" responses are not prescribed (Eisenberg, Lennon, & Roth, 1983). Although empirical research has established the importance of moral reasoning in children's development, particularly for prosocial behavior (e.g., Miller, Eisenberg, Fabes, & Shell, 1996), the parent-child interactions and child characteristics that are associated with moral reasoning have received relatively little attention, despite theoretical arguments for their importance (Hoffman, 2001). In the present study, we investigated interactive effects of children's executive functioning, emotion regulation, and mother-child cooperative behavior on moral reasoning at age 10.

We assessed moral reasoning with the approach taken by Eisenberg and colleagues (e.g., Eisenberg et al., 1983), which evaluates levels of moral reasoning using basic assumptions about the maturation of underlying cognitive and emotional processes. Lower levels of

Correspondence: J. Benjamin Hinnant, Ph.D., Department of Psychology, 303 O'Boyle Hall, The Catholic University of America, 620 Michigan Ave NE, Washington, DC, 20064, Tel: (202) 319-5750, Fax: (202) 319-6263, hinnant@cua.edu.

moral reasoning are characterized by turning to authorities for decisions on moral issues (e.g., a child asking a teacher what is right or wrong) and egocentric decisions (choosing benefits to the self at a cost to others); these types of moral reasoning are common in preschool- and early elementary school-aged children. Higher levels of moral reasoning are characterized by a focus on the needs of others (often at a cost to the self) and strongly internalized values; these types of moral reasoning become more common in mid to late childhood (see Eisenberg et al., 1983, for further detail on levels of moral reasoning). With the 10-year-old sample in this study, we expected that children would display a range of levels of moral reasoning, both self- and other-focused.

Socialization approaches to moral reasoning theorize that moral reasoning is advanced through both direct socialization of moral reasoning (e.g., modeling, practice, and subsequent internalization; Bandura, 1991) and indirectly through socialization of the basic cognitive and emotional abilities that underlie moral reasoning. Vygotsky (1997/1926) has also emphasized the importance of teaching morality by scaffolding the cognitive and emotional abilities that underlie moral reasoning. Such scaffolding requires a collaborative relationship that involves shared goals. In empirical studies, learning opportunities with parents have been found to promote children's moral development (Walker & Taylor, 1991) and a wide array of cognitive processes that underlie moral reasoning such as problem-solving (Neitzel & Stright, 2003) and executive functioning (Bernier, Carlson, & Whipple, 2010). The current study is the first to evaluate the relation between cooperative goal-directed interactions and children's moral reasoning.

Children's Emotional and Cognitive Skills

Structural-developmental approaches to moral reasoning theorize that moral reasoning is limited by the maturation of underlying skills and processes (Piaget, 1965). The ability to down-regulate negative emotions such as anger or jealousy may be important in situations where others' desires conflict with one's own. Additionally, with biological and cognitive maturation, children are better able to plan desired outcomes that support sophisticated moral reasoning. Thus, we examine both children's emotional regulation abilities and their executive function skills as potential predictors of moral reasoning.

Emotion regulation has been defined as "the process of initiating, avoiding, inhibiting, maintaining, or modulating the occurrence, form, intensity, or duration of feeling states, emotion-related physiological, attentional processes, motivational states, and/or the behavioral concomitants of emotion in the service of accomplishing affect-related biological or social adaptation or achieving individual goals" (Eisenberg & Spinrad, 2004, p. 338). According to this definition, emotion regulation is a willful (although not necessarily highly conscious) goal-driven process that is the sum of its motivational, attentional, and behavioral sub-processes. Although emotion regulation has been linked to morally relevant behaviors such as helping in younger children (Fabes, Eisenberg, Karbon, Troyer, & Switzer, 1994), the current study is the first to examine the link between emotion regulation and moral reasoning. Emotion regulation likely plays a role in upregulating emotions such as empathy and sympathy that are associated with sophisticated moral reasoning, as well as downregulating negative emotions such as personal distress, frustration, or jealousy that could interfere with cognitive reasoning processes in moral dilemmas.

Executive functioning is another child characteristic that has been shown to positively relate to prosocial behavior (Eisenberg et al., 1996) and moral reasoning (Kochanska, Murray, & Coy, 1997). Stuss and Alexander (2000) argue that executive function is the situation-specific combination of integrated and converging cognitive abilities that facilitate control functions. Planning abilities allow children to cognitively work through possible outcomes

for both parties in a moral dilemma and weigh costs and benefits of various actions. Inhibitory control of prepotent responding may allow children to create resolutions that are beneficial to both parties rather than focusing solely on self-benefit. Attentional control may be important in maintaining a focus on situations involving moral reasoning and controlling the urge to attend to non-relevant aspects of these situations. Working memory may buttress planning and other aspects of executive functioning by allowing faster cognitive processing and may help children process multiple aspects of a moral dilemma.

Interactions Predicting Moral Reasoning

Although no studies have evaluated interactions between socialization factors and children's individual characteristics or between multiple individual characteristics in the prediction of children's moral reasoning, it seems reasonable to expect multiplicative effects. For example, one study found that two types of perspective taking, cognitive and affective, interacted to predict children's empathy such that children with high levels of both cognitive and affective perspective taking exhibited the highest levels of empathy (Hinnant & O'Brien, 2007). In the present study, we explore the possibility that mother-child cooperation, children's emotion regulation, and children's executive function abilities, in combination, predict variance in moral reasoning beyond what is accounted for by main effects. More specifically, we expected that each of these variables would be positively related to moral reasoning. We also expected interactions in which combinations of high levels of cooperation in the dyad, executive functioning, and emotion regulation would be positively related to moral reasoning.

Method

Participants

The current study used data from the 10-year visit of children engaged in a longitudinal study of emotion regulation. The sample included in the present report represents a subset of this larger study that was selected for secondary analysis as part of a dissertation project and consists of 89 children (49 girls, 40 boys) who were observed in the laboratory at age 10 (M = 128.6 months, SD = 3.1). The majority of the sample is White (57%) or Black (38%). Half of the mothers possessed a college degree or higher; 62% were married at the time of data collection. Tests were conducted to determine if the current sample differed from the sample at initial recruitment (age 2) based on demographic characteristics; a chi-square test indicated that there was no group difference in participants' race, χ^2 (3, N = 154) = 5.65, p = .13, and t-tests indicated no mean differences in mothers' levels of education, t (152) = 1.36, p = .18, or socioeconomic status at age 2, t (152) = 1.27, p = .21.

Procedure

At age 10, children and their mothers participated in a laboratory visit at the university campus. Children and mothers participated in a series of laboratory tasks designed to elicit a variety of behaviors of developmental interest. Mother-child interactions were videotaped and later coded by trained observers. Mothers also completed questionnaires assessing family demographics and their child's behavior.

Measures

Demographic information—Demographic measures were completed by mothers; maternal education, child sex, and child race were selected for evaluation as possible control variables.

Moral reasoning—We evaluated children's moral reasoning by coding children's discussions of short stories during semi-structured mother-child interactions. These discussions were recorded on video for later observational coding. In the task mothers and children engaged in discussions based on a set of six cards given to them by an experimenter. The cards contained descriptions of children in morally ambiguous social situations (e.g., what to do about another child cutting in line to get the last ticket to a movie) and the discussions of the situations were allowed to unfold naturally without scripts or prompts. The short stories were taken from the Crick and Dodge (1996) social information processing task and the Schultz, Yeates, and Selman (1989) Interpersonal Negotiation Strategies Interview. The task lasted approximately 10 minutes.

The coding scheme used to score moral reasoning was developed by Eisenberg et al. (1983) and has since been used in other studies of moral reasoning (Miller et al., 1996). Children's discussion of each vignette was coded into levels of moral reasoning. The levels of moral reasoning are viewed as advancing in cognitive sophistication and understanding of social values and are as follows: Level 1, appeal to authority orientation; Level 2, hedonistic, self-focused orientation; Level 3, needs of others orientation; Level 4, approval and interpersonal orientation and stereotyped orientation; Level 5a, self-reflective, empathic orientation; Level 5b, transitional level; and Level 6, strongly internalized orientation (see Eisenberg et al., 1983, for further detail).

Each statement that a child made could potentially, but not necessarily, be given a moral reasoning score; only statements that fit into one of the levels of moral reasoning were scored. In addition, children's overall quality of reasoning within each level was scored based on how clearly statements fit into a level of moral reasoning; a score of 1 was given for vague/unclear use of a level, a score of 2 was given for clear use, and a score of 3 was given for repeated clear use. Thus, each child received a score ranging from 0 to 3 for each level of moral reasoning in each story. Scores for each level were then summed across stories so that each child received a score ranging from 0 to 18 for each level of moral reasoning. In cases where children repeated their mothers' suggestions, child responses were coded as 1, vague use of a moral reasoning level; simply nodding or saying yes in agreement was scored as 0.[1] On average, 8.3 moral reasoning scores were given for each child across the six short stories.

Following scoring procedures used by Eisenberg et al. (1983), raw scores for each level were then changed to proportions by dividing the raw score for each level by the total score (sum of all levels). Weighted moral reasoning scores for each level of reasoning were computed by taking the proportion of moral reasoning used at each level multiplied by the level of reasoning. Thus, a child who responds with more sophisticated types of moral reasoning will receive a higher overall score than a child who uses less sophisticated reasoning. As an example, if an individual's reasoning scores were such that 50% was at level 3 (needs of others), 25% was at level 5 (expressed empathy), and 25% at level 6 (expression of a strongly internalized value); that individual's overall score would be (.50 × 3) + (.25 × 5) + (.25 × 6) for an overall score of 4.25. The overall score was used for data analysis. Interrater reliability was established by having 20% of the mother/child interactions coded by a second trained coder. The average intraclass correlation coefficient for all levels of moral reasoning was .96; all correlation coefficients for individual levels of moral reasoning were above .90.

Mother-child cooperation—Cooperative goal-directed interactions between mothers and children were coded from videos of mother-child interactions in two laboratory tasks intended to be moderately stressful for the dyad. In one task, mothers directed their children in completing a puzzle which only the child could manipulate but only the mothers could

see. Children put their hands into a "puzzle box" that obscured their view of the puzzle (Eisenberg et al., 2001). Mothers could see the puzzle from an unobscured view. In a second task, mothers and children were asked to work together to write a speech which the child would then give while an experimenter videotaped (Woodruff-Borden, Morrow, Bourland, & Cambron, 2002).

The 7-point rating of Goal-Directed Partnership from the NICHD Study of Early Child Care Parent-Child Interaction Scales: Middle Childhood (Owen, Ware, & Barfoot, 2000) was used as an index of mother-child cooperative goal-directed behavior. High levels of Goal-Directed Partnership were characterized by dyadic interactions in which mothers and children cooperated and worked as a team and interactions were dominated by neither member, the dyad stayed focused on the goal, and the mother and child shared power and took turns leading the interaction. Goal-Directed Partnership in the two tasks were correlated ($r = .42$, $p < .01$) and were averaged. Interrater reliability was established by having 20% of the mother/child interactions coded by a second coder. The average intraclass correlation coefficient for Goal-Directed Partnership was .76.

Child emotion regulation—Child emotion regulation was assessed through maternal report using the Regulation subscale of the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997) which includes 8 items (e.g., "My child can say when he or she is feeling sad, angry or mad, fearful or afraid") each scored on a 4-point Likert scale. Cronbach's alpha reliability for the emotion regulation subscale in this study was .71.

Child executive functioning—Executive functioning was assessed through children's performance on the Delis-Kaplan Executive Function System (D-KEFS) Tower Test (Delis, Kaplan, & Kramer, 2001), which is primarily designed to assess children's executive planning abilities, though it may tap other aspects of executive functioning such as visual attention and inhibition (e.g., Bull, Espy, & Senn, 2004). The D-KEFS Tower Test has been normed with a large, nationally representative sample of children and has been repeatedly shown to be a valid assessment of executive planning (Delis et al., 2001). In this task children are given a wooden board with three pegs of equal height on it. Flat doughnut-like discs of different sizes are stacked, largest to smallest, on one peg at the end of the board. Children are instructed that the goal is to move all of the discs to reproduce a configuration shown to them by the experimenter. They are also instructed that they can move only one disc at a time and that they are not allowed to stack a larger disc on top of a smaller one. In this task there are 9 total trials of increasing difficulty; achievement scores for each trial are based on whether a participant can reproduce the configuration in the time allotted and in the minimum number of moves required. As difficulty increases across trials, higher achievement scores are awarded (e.g., on trial 1, 2 points are awarded if the configuration is completed in 30 seconds and 1 move; on trial 9, 4 points are awarded if the configuration is completed in 4 minutes and 26 moves). Total scores across all trials were summed to assess executive planning.

Results

Data Analytic Strategy

Descriptive and correlational analyses for all study variables were conducted prior to testing the study hypotheses. Hierarchical regression analysis was used to evaluate our hypotheses. Maternal education was included as a control variable along with mother-child cooperative goal-directed behavior, child emotion regulation, executive functioning, and two-way interactions between the three prior variables. We did not test the potential three-way interaction; a power analysis indicated that our sample size was insufficient to evaluate this

possibility (estimated power for the three-way interaction was .64; values > .80 are considered sufficient). All variables were mean centered prior to creating interaction terms. Traditional p values (< .05) were used to assess significance along with R^2 (amount of variance accounted for).

Preliminary Analyses

Four participants were missing measures of emotion regulation and three were missing measures of executive functioning. These data were missing completely at random (MCAR; that is, missingness was not significantly related to any of the study variables), Little's MCAR test, χ^2 (60, N = 89) = 63.95, p = .34. The expectation maximization (EM) method from SPSS was used to impute missing data from all available information. The following results were consistent with results obtained using the default procedures in SPSS (listwise deletion).

In order to evaluate the need to control demographic variables, differences by child sex and race on moral reasoning were examined using analysis of variance; no differences were found, and so these variables were excluded from further analyses. Maternal education was significantly correlated with moral reasoning, r = .25, p = .02, and was included as a control variable. A full table of descriptive analyses is available from the authors upon request.

The most common level of reasoning in this 10-year-old sample was hedonistic reasoning (unweighted mean of 4.01, SD = 2.07); 96% of children used hedonistic reasoning to some extent. Both authority-oriented (unweighted mean of 2.08, SD = 2.04) and non-hedonistic/needs of others reasoning (unweighted mean of 1.93, SD = 1.49) were very common forms of reasoning as well; 66% of children used authority-oriented reasoning in some form, and 84% of children used non-hedonistic/needs of others reasoning to some degree. Higher levels of reasoning were used less often; 6% of the 10-year-olds in this sample used reasoning based on empathy and explicit perspective taking and 11% of children based their reasoning (at least some of the time) on strongly internalized values, the highest level of reasoning. The average *weighted* moral reasoning score was 2.08 (SD = .44).

Moral reasoning was positively correlated with mother-child cooperation, r = .23, p < .05, emotion regulation, r = .24, p < .05, and executive functioning, r = .22, p < .05. Emotion regulation and executive functioning were unrelated while emotion regulation was positively related to mother-child cooperation, r = .49, p < .01.

Regression Analysis

Results of the analysis can be seen in Table 1. The hierarchical regression analysis accounted for 20% of the variance in moral reasoning, a highly significant effect (p < .01). Although the main effects were not significant individually, two interactions were significant. The interaction between executive functioning and emotion regulation, β = −.34, p < .05, revealed that children low on both executive functioning and emotion regulation had the lowest levels of moral reasoning (see Figure 1A), a finding that is largely consistent with our hypotheses. Simple slopes were calculated to assess the significance of the relation between emotion regulation and moral reasoning at high (+1 SD) and low (−1 SD) levels of executive functioning. At low levels of executive functioning emotion regulation was positively related to moral reasoning (β = .37, p = .05) while there was not a significant relation at high levels of executive functioning (β = −.20, p = .29).

The interaction between mother-child cooperation and executive functioning was also significant, β = .31, p = .05. Children who had the highest levels of moral reasoning were those with higher executive function who also were engaged in cooperative interactions with their mothers (see Figure 1B). The positive relation between dyadic cooperation and moral

reasoning was not significant for children with lower executive functioning ($\beta = -.08$, $p = .59$) but was marginally significant for children with higher executive functioning ($\beta = .33$, $p = .07$). The two significant interactions accounted for 7% of the variance in moral reasoning.

Discussion

The current study evaluated how cooperative mother-child interactions, children's emotion regulation, and executive functioning are related to moral reasoning in middle childhood. Overall, our findings suggest that moral reasoning is facilitated by combinations of factors both external and internal to the individual. More specifically, participation in cooperative goal-directed activities with mothers may facilitate scaffolding opportunities for the development of complex reasoning and planning skills that characterize sophisticated moral reasoning. In high quality interactions it was frequently observed that mothers would allow their children to lead the interactions but would be ready to intervene if the task became too distressing and help their children to redirect their efforts. We found a positive relation between cooperative mother-child interactions and moral reasoning, however, only for children who exhibited higher levels of executive functioning. Thus, it is possible that children who are especially capable in their planning abilities benefit most from maternal scaffolding, at least in the context of moral reasoning. Although this finding is somewhat surprising given that parental support is typically thought of as a process that facilitates performance for individuals at lower ability levels, it may be that a minimal level of planning ability is necessary in order for mothers' teaching efforts to effectively boost moral reasoning.

Although no prior research has specifically investigated interactions between executive functioning and emotion regulation in the prediction of moral reasoning, our finding is generally consistent with research linking executive functioning to prosocial behavior (Eisenberg et al., 1996). Moral reasoning has clear cognitive components to it; it involves the processing of information in social situations, perspective taking in order to understand another's needs and desires, accessing rules and beliefs about what is morally right and wrong, formulating possible actions and weighing their costs and benefits, and thinking about possible outcomes and repercussions of actions. Poorer executive functioning, especially as measured in this study (i.e., planning), may inhibit reasoning or planning in morally ambiguous situations. Additionally, a reduced capacity to regulate emotions may hinder reasoning in situations that are tinted with emotion (e.g., jealousy when choosing solutions that benefit the self or another). In this study we found the lowest levels of moral reasoning for children with lower levels of executive functioning and emotion regulation, which suggests a dual-risk vulnerability.

One strength of the study was the use of non-overlapping methods, which eliminates mono-method bias. Additionally, this is one of only a few studies to assess multiple parent-child and child characteristics in the prediction of moral reasoning. There are notable study limitations, however. First, the sample used in this study was relatively small; larger samples yield more stable estimates of associations. Second, the study was cross-sectional and thus provides no information about how these processes may influence one another over time. Related to the cross-sectional nature of the data, it must be noted that the results may not generalize to children at other developmental stages. It is also possible that the results may not be generalizable beyond the context in which moral reasoning was evaluated (reasoning involving conflict in peer situations). While we found that children displayed a range of types of moral reasoning, with about one out of every ten children showing evidence of strongly internalized values (the highest level of moral reasoning in our coding scheme), fewer children displayed usage of clear perspective taking to justify decisions in the stories. Whether this points to either demand characteristics inherent in the moral reasoning task or

to actual development of moral reasoning is an open question and one that cannot be resolved without longitudinal data. Finally, we note that the interactive nature of the task allowed for the possibility that mothers might contribute to children's moral reasoning scores, though children's responses that parroted mothers' suggestions were given lower scores.

Future research could expand on knowledge in this area by exploring longitudinal modeling of transactions between parents, children's neurodevelopment, and children's psychological development (Schore, 2000) that contribute to moral reasoning. For example, parental support has been positively associated with electrophysiological measures of children's anterior cingulate cortex activity (Stieben, 2008); the anterior cingulate is a structure tied to inhibitory control, executive function, and empathy (Decety & Jackson, 2006). Additionally, it will be important to consider if the processes that lead to moral reasoning may differ in direction or strength based on certain demographic characteristics, such as family SES or parental education. By understanding how children think in morally ambiguous situations, the reasoning that they use to formulate their responses, and what parental and child psychological characteristics are related to these processes, we can facilitate parenting and the formulation of socially beneficial programs to socialize moral consciousness in children.

Acknowledgments

This research was supported in part by NIMH grant R01 MH55144 and NRSA award (5-T32-HD007376) to the Carolina Consortium on Human Development at the Center for Developmental Science, University of North Carolina at Chapel Hill.

References

Bandura, A. Social cognitive theory of moral thought and action. In: Kurtines, WM.; Gewirtz, JL., editors. Handbook of Moral Behavior and Development. Vol. 1. 1991. p. 45-106.

Bernier A, Carlson SM, Whipple N. From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. Child Development. 2010; 81:326–339. [PubMed: 20331670]

Bull R, Espy KA, Senn TE. A comparison of performance on the towers of London and Hanoi in young children. Journal of Child Psychology and Psychiatry. 2004; 45:743–754. [PubMed: 15056306]

Crick NR, Dodge KA. Social information-processing mechanisms on reactive and proactive aggression. Child Development. 1996; 67:993–1002. [PubMed: 8706540]

Decety J, Jackson PL. A social-neuroscience perspective on empathy. Current Directions in Psychological Science. 2006; 15:54–58.

Delis, DC.; Kaplan, E.; Kramer, JH. The Delis-Kaplan Executive Function System. San Antonio: The Psychological Corporation; 2001.

Eisenberg N, Fabes RA, Karbon M, Murphy BC, Wosinski M, Polazzi L, Carlo G, Juhnke C. The relations of children's dispositional prosocial behavior to emotionality, regulation, and social functioning. Child Development. 1996; 67:974–992. [PubMed: 8706539]

Eisenberg N, Lennon R, Roth K. Prosocial development: A longitudinal study. Developmental Psychology. 1983; 19:846–855.

Eisenberg N, Spinrad TL. Emotion-related regulation: Sharpening the definition. Child Development. 2004; 75:334–339. [PubMed: 15056187]

Fabes RA, Eisenberg N, Karbon M, Troyer D, Switzer G. The relations of children's emotion regulation to their vicarious emotional responses and comforting behaviors. Child Development. 1994; 65:1678–1693. [PubMed: 7859549]

Hinnant JB, O'Brien M. Cognitive and emotional control and perspective taking and their relations to empathy in 5-year-old children. Journal of Genetic Psychology. 2007; 168:301–322. [PubMed: 18200891]

Hoffman, ML. Empathy and moral development: Implications for caring and justice. New York, NY: Cambridge University Press; 2001.

Kochanska G, Murray K, Coy KC. Inhibitory control as a contributor to conscience in childhood: From toddler to early school age. Child Development. 1997; 68:263–277. [PubMed: 9180001]

Miller PA, Eisenberg N, Fabes RA, Shell R. Relations of moral reasoning and vicarious emotion to young children's prosocial behavior toward peers and adults. Developmental Psychology. 1996; 32:210–219.

Neitzel C, Stright AD. Mothers' scaffolding of children's problem solving: Establishing a foundation of academic self-regulatory competence. Journal of Family Psychology. 2003; 17:147–159. [PubMed: 12666470]

Owen MT, Ware AM, Barfoot B. Caregiver-mother partnership behavior and the quality of caregiver-child and mother-child interactions. Early Childhood Research Quarterly. 2000; 15:413–428.

Piaget, J. The Moral Judgment of the Child. New York: Free Press; 1965.

Schore AN. Attachment and the regulation of the right brain. Attachment & Human Development. 2000; 2:23–47. [PubMed: 11707891]

Schultz, LH.; Yeates, KO.; Selman, RL. The Interpersonal Negotiation Strategies (INS) Interview: A Scoring Manual. Cambridge, MA: Harvard Graduate School of Education; 1989.

Stieben J. Medial prefrontal correlates of maternal empathy and parenting styles. Clinical Neurophysiology. 2008; 119:112–112.

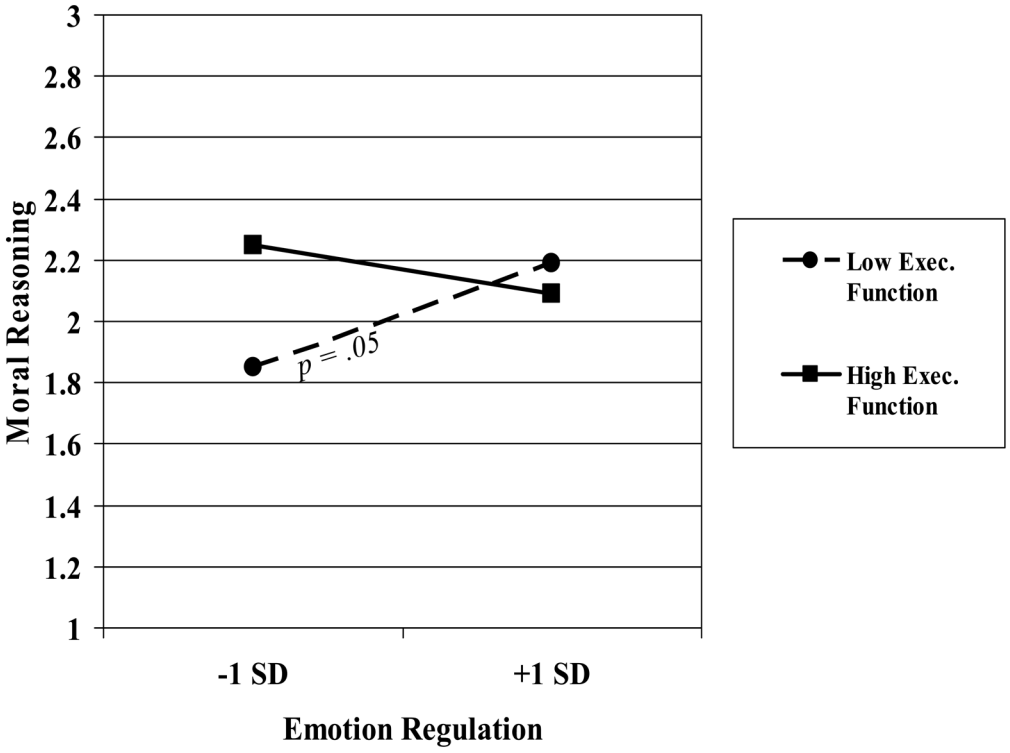
Shields A, Cicchetti D. Emotion regulation among school-age children: The development and validation of a new criterion Q-sort scale. Developmental Psychology. 1997; 33:906–916. [PubMed: 9383613]

Stuss DT, Alexander MP. Executive functions and the frontal lobes: A conceptual view. Psychological Research. 2000; 63:289–298. [PubMed: 11004882]

Vygotsky, LS. Educational psychology. Silverman, R., translator. Boca Raton: St. Lucie Press; 1997. Original work published in 1926

Walker LJ, Taylor JH. Family interactions and the development of moral reasoning. Child Development. 1991; 62:264–283.

Woodruff-Borden J, Morrow C, Bourland S, Cambron S. The behavior of anxious parents: Examining mechanisms of transmission of anxiety from parent to child. Journal of Clinical Child and Adolescent Psychology. 2002; 31:364–374. [PubMed: 12149974]



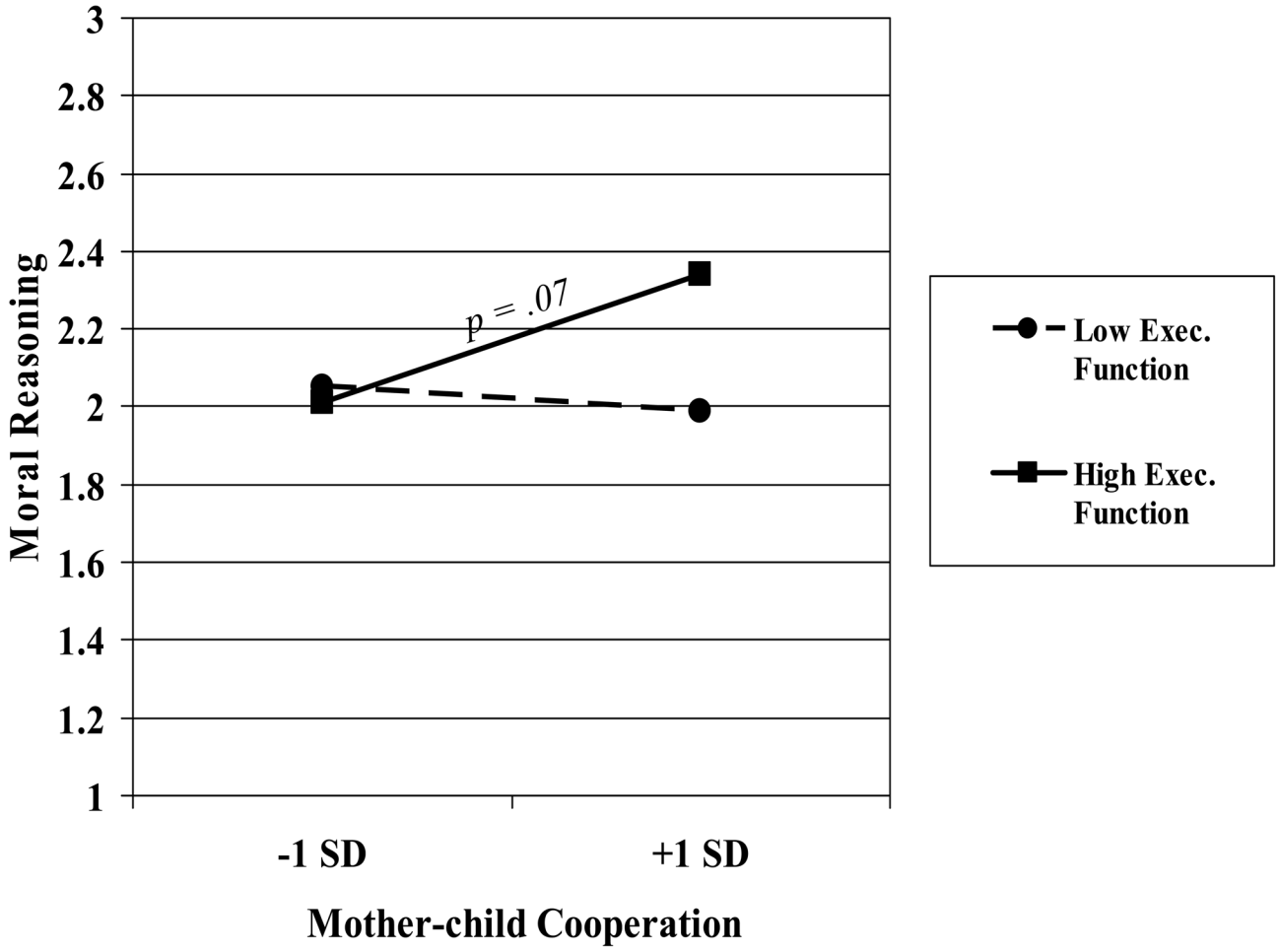


Figure 1.

Figure 1A and 1B. Interaction between emotion regulation and executive function predicting children's moral reasoning and interaction between mother-child cooperation and executive function predicting children's moral reasoning.

Table 1

Hierarchical Regression Predicting Children's Moral Reasoning

	Moral Reasoning			
	***B* (*SE*)**	***β***	***t***	**ΔR^2**
Intercept	1.91 (.21)		9.01*	
Maternal education	.05 (.06)	.11	.92	
Mother-child cooperation	.08 (.08)	.13	1.03	
Step 1				.08
Child emotion regulation	.10 (.13)	.09	.72	
Child executive function	.03 (.02)	.18	1.74	
Step 2				.05
Cooperation x emotion regulation	−.09 (.13)	−.09	−.73	
Cooperation x executive function	.05 (.03)	.31	1.96*	
Emotion regulation x executive function	−.13 (.06)	−.34	−2.03*	
Step 3				.07

Note. *B* = unstandardized regression coefficient; *SE* = standard error; *β* = standardized regression coefficient.

* $p < .05$.