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The relations among children's moral reasoning, emotion regulation, executive planning abilities, quality of the mother-child relationship, and cognitive support and stimulation provided by parents, were examined in 87 10-year-old children. Theoretically driven hypotheses regarding the mediational pathways among these variables were tested in several comparative path analytic models. A mediational model wherein parental characteristics were indirectly related to moral reasoning via child characteristics was found to fit the data best.

Specifically, children's executive functioning was directly and positively related to moral reasoning. The quality of the mother-child relationship was positively related to children's emotion regulation and marginally, positively related to moral reasoning via children's emotion regulation. Findings from these mediational analyses and their implications are discussed in detail.

MEDIATIONAL PATHWAYS TO MORAL REASONING: QUALITY OF THE  
MOTHER-CHILD RELATIONSHIP, COGNITIVE SUPPORT,  
AND CHILDREN'S EMOTION REGULATION  
AND EXECUTIVE FUNCTIONING

by

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For my parents, Milton and Jane

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## CHAPTER I

### INTRODUCTION

The study of the development of moral reasoning in childhood is the study of how children first learn moral directives, interpret them, and internalize them as well as how moral directives can be co-constructed and reconstructed as children's emotional and cognitive abilities mature. It is the study of how children come to understand right and wrong and the reasoning that motivates action to address issues of right and wrong. Moral reasoning can be an important factor in defining how individuals assess a social situation, view their duties to act in a situation, and react to the needs of others and has been associated with compassionate responding (e.g., Eisenberg & Shell, 1986). Both structural-developmental (stage) theories of moral reasoning and socialization theories of moral reasoning have made important contributions to the current state of inquiry in this area. Empirical work has found evidence that both maturational and socializing influences are important to the development of moral reasoning. The most recent studies of prosocial moral reasoning, defined as the reasoning about situations in which one's desires or needs are in conflict with another's in the absence of formal rules or guidelines (Carlo, Eisenberg, & Knight, 1992), make it clear that while there are no invariant developmental stages to moral reasoning there are developmental trends and these trends are related to socialization, especially socialization from parents (Eisenberg, Lennon, & Roth, 1983).

This section traces the recent history of theory in moral reasoning and links it to supporting research while addressing how these theories view the relation between moral reasoning and prosocial behavior. It begins with the classic structural-developmental approaches of Piaget and then Kohlberg and Gilligan as well as Eisenberg's reformulation of the structural-developmental approach. It then addresses influential socialization approaches that include theories from Bandura, Vygotsky, and Hoffman and ends with a summary of both structural-developmental and socialization approaches and the work of theorists who have made efforts to blend the two views.

### Structural-Developmental Approaches

#### *Piaget's Approach*

Piaget's (1965) theorizing on moral reasoning is highly consistent with his genetic epistemology, namely that children's, indeed everyone's, moral reasoning is a constantly shifting system that is always adapting to assimilate and accommodate new knowledge and thoughts but that this system is limited by its maturational constraints. The illogical thinking in the preoperational stage also characterizes Piaget's (1965) heteronomous stage of moral development. Very young children do not have the cognitive abilities necessary to take in the multiple aspects of moral situations and so tend to concentrate on one prominent aspect of a moral dilemma. Additionally, moral reasoning in very young children tends to be egocentric because children lack the cognitive abilities necessary to take others' perspectives in any great detail. Because of limitations in cognitive ability, children must rely heavily on environmental and parental factors to help them assimilate the generalities of right and wrong. In heteronomous morality parents are the

unquestioned sources of moral teaching and children, when asked to reason on their own, apply previous general ideas of morality universally (Jose, 1991), meaning that during this stage of moral development children do not use their own reasoning skills to choose their moral responses but apply the teachings given to them by their parents. For young children, prosocial behavior, especially prosocial behavior that involves cost to the self (e.g., sharing a toy), is enacted because it is required by authority.

With cognitive maturation children are better able to take others' perspectives, assimilate and accommodate information into their own moral system, and co-construct moral rules through peer interactions. In this stage of moral development there is the recognition that moral rules are not immutable; they can be questioned and negotiated through internal or social discourse. Prosocial behavior is driven by the ability to understand others' situations through perspective taking and the knowledge that morality is increasingly defined by both the self and the social group; failing in a moral obligation is also a failure to the self and the group.

Much of Piaget's (1965) theory of moral development has received empirical support. Young children do seem to have a belief in immanent justice (Jose, 1991), but moral reasoning involving children's independent assessments of right and wrong in situations develops along with advances in perspective taking and the cognitive advances associated with biological maturation (DeRemer & Gruen, 1979). If Piaget's theory has a shortcoming, it is in underestimating the age at which children have the cognitive abilities to decide for themselves what is moral action (Smetana, 1981) and in underestimating the importance of emotion in promoting moral action.



### *Kohlberg and Gilligan*

Though he drew heavily upon the work of Piaget, Kohlberg's (1981) theory of moral development more strictly divides development into stages and more clearly defines their characteristics and criteria. The first stage of pre-conventional morality is characterized by fear of authority and punishment and magical-type beliefs (immanent justice) for governing moral reasoning and prosocial behavior is enacted because not to enact it could result in punishment. Similarly, at the second stage of pre-conventional morality children's reasoning and prosocial behavior are driven by the desire to obtain rewards. In conventional morality individuals' reasoning and prosocial behavior are still driven by rewards but those rewards are less materialistic; individuals are rewarded by knowing that they have earned the respect or admiration of others for doing good works and that they are obeying the moral decrees of society. In post-conventional morality individuals understand that the decrees of society are socially constructed and alterable but they enact prosocial behavior because they respect the implicit social contract. In the final stage of post-conventional morality individuals understand that laws and even society itself are designed to uphold universal principles of ethics; when an aspect of a rule violates those ethical principles the individual is no longer bound to uphold the rule. Although the stages of moral reasoning are more clearly defined than they were in the work of Piaget, the invariance and non-regressive nature of Kohlberg's stage theory has been called into question (see Lapsley, 2006).

Gilligan (1977; Gilligan & Attanucci, 1988) has also criticized Kohlberg's work as being biased towards the moral orientations of males while ignoring the moral

orientation of females. Gilligan's argument is that, generally speaking, males have a more justice-based orientation to morality whereas females have a more care-based orientation to morality that is concerned with the social relationships that define the subtleties of moral dilemmas. Contrary to this prediction, however, a meta-analysis on gender differences in justice and care moral orientations revealed significant but very small effects; between 1 and 2.5% of the variance in care and justice orientations are explained by gender (Jaffee & Hyde, 2000; see also Walker, 2006 for further review).

### *Eisenberg*

Eisenberg's approach to the development of moral reasoning is based very loosely on the work of both Piaget and Kohlberg and is currently one of the most influential approaches to the study of the development of moral reasoning. It is based on Piaget's and Kohlberg's work in the sense that it evaluates *levels* of moral reasoning using basic assumptions about the maturation of cognitive development and the limitations they place on reasoning ability. Eisenberg's approach is notably age-developmental - rather than a strict hierarchy of invariant stages, she proposes levels of reasoning in order of complexity and openly accepts that regression from one level to another may happen. Additionally, multiple types of moral reasoning may be used at the same time in evaluating the same situation. In fact, empirical evidence suggests that while hedonistic, self-focused moral reasoning decreases from middle childhood until adolescence, during adolescence hedonistic reasoning increases somewhat until adulthood (Eisenberg, Miller, Shell, McNalley, & Shea, 1991). To compensate for this rising self-focus during adolescence, other forms of more advanced moral reasoning rise during this period as

well (Eisenberg, Carlo, Murphy, & Van Court, 1995; Eisenberg, Lennon, & Roth, 1983; Eisenberg et al., 1991; Eisenberg-Berg & Roth, 1980). Overall, the typical picture of the development of moral reasoning is one in which, for young children, self-focused reasoning dominates and other-focused reasoning is gradually increasing over time. For children in middle childhood, other-focused reasoning is steadily increasing while self-focused reasoning decreases. In adolescence, self-focused reasoning increases while other-focused reasoning is also increasing. In assessing the practical relevance for understanding the development of moral reasoning, considerable evidence has been found to support the theory that prosocial moral reasoning is related to prosocial behavior across a wide range of developmental periods, from childhood through early adulthood (Carlo, Koller, Eisenberg, Da Silva, & Frohlich, 1996; Jansens & Dekovic, 1997; Miller, Eisenberg, Fabes, & Shell, 1996).

#### Socialization Approaches

Hoffman (2000), Bandura (1998), and Vygotsky (1997/1926; see Turner & Berkowitz, 2005, for a review) present the most clearly relevant socialization approaches to understanding children's moral development, although they differ in their emphases on which mechanisms of socialization influence moral reasoning most heavily. Bandura (1998) has emphasized the roles of modeling and learning through vicarious experience (e.g., observing others in morally-related social interactions and the outcomes). Notably, he proposed that observational learning could lead to the internalization of moral reasoning above previous levels of reasoning not through simple mimicry but through observing the reasoning used by others, learning from it, *and then* putting it to use in their

own moral situations. Some evidence supporting this idea can be seen in Bandura and MacDonald's (1963) research; boys who observed a model using moral reasoning higher or lower than their own used moral reasoning similar to the model's on subsequent trials. In a social cognitive approach, moral reasoning is first observed and learned and then applied to one's own situations and internalized; it is through learning and internalization that moral reasoning can then be applied to motivate prosocial behavior.

Hoffman (2000) and Vygotsky (1997/1926) have emphasized the importance of teaching morality. Both theorists have emphasized the importance of having competent others such as parents and older siblings explaining and scaffolding moral development at an appropriate level. Vygotsky in particular has emphasized the role of scaffolding the cognitive and emotional abilities underlying moral reasoning. Scaffolding is a broad term, but in the context of scaffolding moral reasoning it can be viewed as the support that parents and others give to children that help them to develop the abilities necessary to reason independently, plan actions, and develop strategies to regulate the emotions associated with interpersonal interactions that may involve conflicts of interest.

Hoffman has especially emphasized the role of emotional inductions. Emotional induction is a strategy that Hoffman theorized as being an important catalyst in the internalization of morals. Emotional inductions involve parents using emotion-laden speech and discussion to arouse children's emotions to prime them to learn a lesson in moral reasoning, usually about taking another's perspective. In the early years parents and other environmental socializers are the source of moral reasoning and prosocial behavior. After induction after induction, moral reasoning becomes internalized to the

child. Moral reasoning can then motivate prosocial behavior from within the child and failure to act morally results in guilt (a negative reinforcement to act prosocially in the future). Some support has been shown for this theory; in a summary of empirical work Hoffman (1970) found that both inductions and parental warmth were related to the internalization of morality but power assertive parenting techniques were not. It seems likely that a combination of both parental warmth and inductions would be most effective for parents' teaching of moral reasoning.

#### Summary

As with most theories, each position (structural-developmental and socialization) is stated such that a literal interpretation of the theories puts them in opposition to each other. I think it likely that the theorists themselves would agree that although the development of children's moral reasoning is to a degree socialized through modeling, vicarious experience, and the teachings and inductions of parents, it is also created through children's co-construction of moral beliefs with peers and through internal systems of accommodation and assimilation. Indeed, it can be seen that there are degrees of overlap in the approaches. For example, Hoffman's theory presupposes that inductions from parents will promote the development of a moral reasoning system within children. Perhaps it is best to take the middle ground and acknowledge that both structural-developmental and socialization approaches have merit and contribute to an understanding of the development of moral reasoning. The following literature review builds evidence for the hypothesis that both structural-developmental and socialization approaches are important to consider in investigating moral reasoning and the processes

that underlie moral reasoning. These approaches are blended in the current study. We investigate the extent to which structural-developmental characteristics (emotion regulation and executive functioning) contribute to moral reasoning as underlying processes as well as the extent to which parental socialization (quality of the mother-child relationship and parental cognitive support and stimulation) is related to moral reasoning both directly and indirectly through the scaffolding of structural-developmental characteristics.

### Literature Review

Although empirical research has established the importance of moral reasoning, especially to prosocial behavior (e.g., Carlo, Koller, Eisenberg, Da Silva, & Frohlich, 1996; Janssens & Dekovic, 1997; Miller, Eisenberg, Fabes, & Shell, 1996), the parent-child interactions, parental practices and behaviors, and child psychological characteristics (other than the emotional responses of empathy and sympathy) that contribute to moral reasoning have received relatively little attention, despite theoretical arguments for their importance (Hoffman, 2000). Indeed, structural-developmental approaches hypothesize that moral reasoning is limited by the maturation of the skills and processes that underlie moral reasoning. For example, the ability to down-regulate negative emotions like frustration may be important when dealing with others' desires that conflict with one's own. The planning abilities necessary to think through possible outcomes and structure the steps necessary to achieve a desire outcome are also an important component of moral reasoning. In both of these examples, a structural-developmental approach would dictate that these abilities develop over the course of time

although, as seen through a socialization approach lens, they are also likely influenced by social agents such as parents.

Socialization approaches hypothesize that moral reasoning is advanced through both direct socialization of moral reasoning (e.g., modeling, practice, and subsequent internalization) (Bandura & MacDonald, 1963) but also through socialization of the abilities that underlie moral reasoning. In other words, parents and other socializing forces may not only influence children's moral reasoning abilities directly, but also indirectly by scaffolding and training children to use the basic cognitive and emotional abilities that underlie moral reasoning. In the present study structural-developmental and socialization approaches are investigated in order to contribute to our understanding of how both children's psychological capacities and parental socialization of those psychological capacities are related to moral reasoning.

Research into the components of moral reasoning has practical applications. Moral reasoning can be an important factor in defining how individuals assess a social situation, view their duties to act in a situation, and react to the needs of others. Moreover, moral reasoning has been associated with compassionate responding. Prosocial responding, in turn, is positively related to children's peer status, friendships, and social competence (Lansford, Putallaz, Grimes, Schiro-Osman, Kupersmidt, & Coie, 2006; Warden & Mackinnon, 2003; Wojslawowicz Bowker, Rubin, Burgess, Booth-LaForce, & Rose-Krasnor, 2006). Through understanding moral reasoning we understand one avenue to social competence.

The development of moral reasoning is a product of both learning and the biological maturation of the abilities necessary for this type of reasoning. The implication is that moral reasoning can be taught based on children's level of psychological development; children can receive developmentally appropriate aid in advancing moral reasoning and the skills that contribute to it. Additionally, by describing the links between parental support and child moral reasoning it may be possible to help parents learn to facilitate the growth of moral reasoning in their children. In the present study a comprehensive model is proposed that integrates aspects of parental facilitation and support, child executive function and emotional regulatory abilities, and the mediational pathways by which they are related to children's moral reasoning.

In the proposed model children's moral reasoning is hypothesized to be related to both child and parent factors through mediational pathways. In this model there are two main areas of influence on moral reasoning: 1) parental characteristics, including the quality of the mother-child relationship and parental support and facilitation of children's basic cognitive abilities, and 2) children's emotion regulation and executive functioning. Parental characteristics are hypothesized to be related to moral reasoning through child processes (i.e., the quality of the mother-child relationship and cognitive support and stimulation are thought to influence children's emotion regulation and executive functioning which, in turn, are processes directly related to moral reasoning). The hypothesized model can be found in Figure 1. In the following pages the literature linking these constructs to one another are described in more detail and the conceptual relations between them are reviewed. In any mediational hypothesis or model one must usually



establish that a) there is a relation between the mediated factor and the outcome; b) there is a relation between the mediator and the outcome and; c) the relation between mediated factor and the outcome can be explained by the mediator. This literature review follows this guideline; given that moral reasoning is the outcome of interest, discussion of the constructs proceeds from moral reasoning to distal/mediated factors (parental characteristics) to proximal/mediating factors (child characteristics).

### *Moral Reasoning*

Theorists have hypothesized that moral reasoning, in particular prosocial moral reasoning, is an important catalyst for prosocial behavior (Carlo, Eisenberg, & Knight, 1992). Ways of moral reasoning become integrated into children's self concepts and motivate prosocial behavior (Hoffman, 2000), although cognitive advances over time are expected to change the sophistication of moral reasoning as well (Eisenberg & Shell, 1986). Consistent with theory, researchers have found positive associations between prosocial moral reasoning and prosocial behavior in children (Carlo et al., 1996; Janssens & Dekovic, 1997; Miller et al., 1996). The purpose of the current study, however, is to delineate more clearly the components of moral reasoning and their relative contributions to explaining variance in children's levels of moral reasoning.

Middle childhood is an important time to study moral reasoning in children. Both Piaget (1965) and Kohlberg (1981) posited that children around the age of 10 are making important changes in the way they think about moral situations. During this time hedonistic moral reasoning based on benefit to the self is decreasing while other-oriented moral reasoning is increasingly common. Supporting this, Eisenberg and colleagues

(Eisenberg, Lennon, & Roth, 1983; Eisenberg et al., 1987) found that in middle childhood children's hedonistic reasoning decreases with age and that most other-oriented types of moral reasoning increase with age, up until adolescence when both hedonistic and other-oriented types of moral reasoning both increase.

*Parental Characteristics: Quality of the Mother-Child Relationship*

The quality of the mother-child relationship may be particularly important in facilitating the growth of both moral reasoning and emotion regulation. Kochanska, Forman, Aksan, and Dunbar (2005) found that the quality of the mother-child relationship, termed mutually responsive orientation and characterized by mutual responsiveness and shared affect, was positively related to young children's moral cognitions. Prior research by Kochanska and colleagues supports these findings (e.g., Kochanska, Forman, & Coy, 1999; Kochanska & Murray, 2000). Similar findings have been reported by other researchers; for example, Laible and Thompson (2000) found that positive shared affect was related to 4-year-olds' guilt after misbehavior and resistance to temptation in laboratory observations. A limitation in this area of research is the limited age range under study; most prior studies have included only pre-K and early school age children.

In responding sensitively and supportively to children's distress, parents may help children to build their emotion regulatory capabilities. Research has established that young children who are attached to their parents through consistently warm and supportive interactions tend to have good regulatory abilities (for a review see Calkins & Hill, 2007). Additionally, there is evidence that emotionally supportive parenting is

related to regulation in older children as well; Neitzel and Stright (2003) found that for early adolescent children emotional support was positively related to children's task persistence and behavioral control one year later. By offering warmth and support in their interactions with their children, parents may engender care-based reasoning in their children. Garner (2006) found that aspects of maternal emotional support were positively related to both emotion regulation and prosocial behavior in a sample of young African American children. Similarly, mothers' encouragement of emotional expression and emotion-focused maternal reactions to children's negative experiences were positively related to comforting and helping in young boys, though this was not true for girls (Eisenberg, Fabes, & Murphy, 1996). Davidov and Grusec (2006) found that maternal responsiveness to child distress was positively related to children's regulation of negative affect and prosocial behavior.

One caveat to the research in this area is that warm and supportive parenting is often discussed as if it is interchangeable with the quality of the mother-child relationship; though the concepts are highly related one is a quality of an individual while the other is a quality of a dyadic relationship. Specifically dealing with the quality of the mother-child relationship and regulation, Cole, Teti, and Zahn-Waxler (2003) found that poor mutual regulation of anger in mother-child dyads was related to young boys' later conduct problems. This finding would seem to be consistent with a socialization perspective of moral reasoning; parent-child interactions provide a context for parents to scaffold children's regulatory abilities and the opportunity to teach them strategies for dealing with emotions. Though a potentially important link, the relation between the

quality of the mother-child relationship and child moral reasoning as mediated by children's emotional regulation has not been examined in the literature.

*Parental Characteristics: Cognitive Support and Stimulation*

Although it is reasonable to think that the cognitive stimulation and support that children receive from their parents should be related to moral reasoning there is little empirical evidence to support this connection (Carlo, Fabes, Laible, & Kupanoff, 1999). In theory, learning opportunities with parents should promote cognitive development in a wide array of areas, including the cognitive processes that underlie moral reasoning. In one of the few studies relating parental cognitive stimulation and support to moral reasoning, Walker and Taylor (1991) conducted an investigation of children's moral reasoning and parental styles of cognitive interaction with their children. They found that children's moral development was positively related to parents' use of higher level moral reasoning during interactions and that parents' questioning of children's moral reasoning facilitated subsequent higher level reasoning. Similarly, Pratt, Arnold, Pratt, and Diessner (1999) found that fathers' but not mothers' discussions of moral reasoning with their early adolescent children was related to their children's later moral reasoning.

Parents' cognitive scaffolding and support has been shown to be related to children's problem solving and use of cognitive strategies (Neitzel & Stright, 2003) and to efforts to actively involve children in problem solving effort (Neitzel & Stright, 2004). Consistent with a socialization perspective, it is reasonable to hypothesize that parent-child interactions guided by the parent with the purpose of teaching children attentional,

planning, and reasoning skills should facilitate executive functioning abilities. It would be expected that those abilities are also positively related to moral reasoning.

*Child Psychological Characteristics: Emotion Regulation*

In considering the relation between emotion regulation and moral reasoning, it is important to distinguish between children's temperamental emotionality and the behaviors and strategies that are used to regulate that emotionality (Cole, Martin, & Dennis, 2004). While studies relating emotion regulation to moral reasoning are scarce, aspects of children's emotionality have been found to be related to prosocial behavior. Negative emotionality/lability has been reported to be negatively related to prosocial behavior (Eisenberg, Fabes, Karbon, et al., 1996) as has combined negativity and reactivity (impulsivity or swiftness in emotional reactions) in conjunction with child anger (Diener & Do-Yeong, 2004) and difficult temperament (Blair, Denham, Kochanoff, & Whipple, 2004). In the present model, however, it is hypothesized that emotion regulation, rather than temperamental reactivity, plays the essential role in children's 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). This definition further refines the definition offered by Cole et al. (2004) (emotion as *regulated* rather than *regulating*) and describes emotion regulation as

a willful (though not necessarily highly conscious), functional, goal-driven process that is the sum of its motivational, attentional, and behavioral sub-processes. The prevailing theory is that emotion regulation is especially important in promoting prosocial behavior when the situation of another is emotionally arousing (Eisenberg, Wentzel, & Harris, 1998); although different types of regulation have been linked to morally relevant behaviors in both children and adults, no research has been conducted that examines the links between emotion regulation and moral reasoning (e.g., Eisenberg, 2000).

In general support of the importance of emotion regulation to moral reasoning, children's arousal regulation has been shown to be related to helping in younger children (Fabes, Eisenberg, Karbon, Troyer, & Switzer, 1994; Ungerer, Dolby, Waters, Barnett, Kelk, & Lewin, 1990). Given that a positive association between regulation and prosocial behavior has been established, it is reasonable to hypothesize that regulation would also be positively related to moral reasoning. Attention to another's emotional arousal may be experienced as empathy and a subsequent motivation to help, but too much vicarious arousal may result in personal distress and the urge to escape (Eisenberg, 2000). One function of emotion regulation is to inhibit overarousal and maintain a degree of empathic arousal through attentional (e.g., momentary gaze aversion) or behavioral (e.g., self-soothing) processes in the service of a larger goal (helping). For this same reason, emotion regulation is proposed to be an important predictor of moral reasoning. More sophisticated types of moral reasoning that are other-focused (reasoning not based solely on benefit to the self or "give and take" tradeoffs) often have an emotional component. It may be that the emotions associated with interpersonal interactions involving conflict,

particularly negative emotions such as personal distress, frustration, or jealousy, could interfere with cognitive reasoning processes in moral situations; the ability to regulate negative emotions may facilitate moral reasoning. Emotion regulation may also play a role in maintaining or intensifying emotions such as empathy and sympathy that are associated with sophisticated moral reasoning and provide additional impetus for prosocial behavior.

#### *Child Psychological Characteristics: Executive Functioning*

In the current paper, executive functioning is also considered as an important child cognitive characteristic that is related to moral reasoning. Currently, there is no universally accepted definition of executive functioning. Inhibitory control of prepotent responding, working memory, attentional control, cognitive flexibility/rule switching, planning, goal monitoring, and error detection and correction are all processes that have been defined as important to executive functioning (Engle & Kane, 2004; Espy & Kaufmann, 2002; Moses, Carlson, & Sabbagh, 2007; Zelazo, Carter, Reznick, & Frye, 1997). Carlson (2005) offers a simple *functional* definition of executive function as the “higher order, self-regulatory, cognitive processes that aid in the monitoring and control of thought and action” (p. 595). Thus, depending on the context, any number of the above mentioned processes may comprise executive functioning. In a similar line of thought, Stuss and Alexander (2000) argue that there is no unitary executive function but rather that executive function is the situation-specific combination of integrated and converging cognitive abilities that facilitate control functions.

Executive functioning or aspects of executive functioning may facilitate moral reasoning through multiple avenues. Planning may 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 or distracting aspects of these situations. Working memory may buttress planning and other aspects of executive functioning by allowing faster cognitive processing and may help children to keep in mind multiple aspects of a moral dilemma.

In support of the links between aspects of executive functioning and moral reasoning, Dunn and Hughes (2001) found that measures of working memory and attention and executive function (the Tower of London) were negatively related to young children's violent pretend play. Kochanska, Murray, and Coy (1997) found that children's inhibitory control was positively related to moral reasoning and some moral behaviors (e.g., restraint from cheating in a game). Additionally, aspects of executive function have been found to be positively related to prosocial behavior (Eisenberg, Fabes, Karbon, Murphy, Wosinski, Polazzi, et al., 1996; Moore, Barresi, & Thompson, 1998).

Emotion regulation and executive functioning may employ similar processes (e.g., attentional control, inhibitory control, self-monitoring and self correction); like Stuss and Alexander (2000), I argue that they are both the convergence of integrated processes for achieving a goal, though the goals of each may differ (i.e., the regulation of emotion



versus the regulation of thought and behavior). It is also argued that the functions of emotion regulation and executive functioning are highly similar, though they operate in different domains. Emotion regulation involves the processes that inhibit, maintain, and modulate affect and affect-based action in the service of a goal whereas executive functioning involves the processes that inhibit, maintain, and modulate cognition and cognitively-driven action in the service of a goal. Whether or not the processes involved in emotion regulation and executive function are physiologically the same or unique for cognitive and emotional domains and the extent to which these domains are functionally integrated is a topic on the frontier of child development research and speaks to the broader question of the integration of cognition and emotion throughout development.

Bell and Wolfe (2004) have proposed that aspects of cognition and emotion are integrated early in life, as early as the first year. Leerkes, Paradise, O'Brien, Calkins, and Lange (2008) have hypothesized that cognitive and emotional control begin as distinct constructs but become integrated as children mature and learn to employ both types of abilities simultaneously to solve problems and navigate social relationships. They found that in 3.5-year-old children, latent constructs measuring cognitive control and emotional control were positively related to one another but that neither construct was significantly related to a measure of preschool academic ability. Of the two types of control, only emotional control was negatively related to reports of socio-emotional problems. One possible interpretation is that young children's cognitive and emotional control processes employ some of the same basic sub-processes (thus accounting for their interrelation) but are not yet integrated in social and academic aspects of children's lives. Additionally, the

expression of emotion regulation and executive function in social contexts in older children may be indistinguishable to observers; Buckner, Mezzacappa, and Beardslee (2003) found that interviewers' ratings of emotion regulation and executive function of adolescents and children in middle childhood were so highly correlated that they were combined into one self-regulatory construct. Other empirical work supports the hypothesis that aspects of emotion regulation and executive function are positively related, at least for younger children. It is possible that these interrelations can be accounted for by shared processes that underlie both emotion regulation and executive function. Gerardi-Caulton (2000) found that 2-year-old children's inhibitory control was negatively correlated with ratings of children's negative emotionality and frustration at about  $-.38$ .

Research relating emotion regulation to executive functioning in older children is more equivocal. Perez and Gauvain (2005) found that 7-year-old children high in emotional intensity performed better on a planning task when they used fewer maladaptive emotion regulation strategies but no significant main effects or other moderated effects were found. In 7- to 10-year-old children, Simonds, Kieras, Reuda, and Rothbart (2007) found that executive attention was positively related to emotion regulation and socially appropriate emotional expression during a disappointing gift task. The current evidence suggests that emotion regulation and executive functioning are positively related, possibly because they engage similar underlying processes. Indeed, aspects of emotion regulation and executive functioning seem to share at least some of the same areas of the brain (Bush, Luu, & Posner, 2000). Analyses in the present study

can test hypotheses regarding the interrelations between executive function and emotion regulation as well as their contributions to moral reasoning in middle childhood.

### Summary and Hypotheses

Research has documented the positive relation between moral reasoning and prosocial behavior (e.g., Carlo et al., 1996; Janssens & Dekovic, 1997; Miller et al., 1996). Less effort has been focused on understanding the child and parental factors related to moral reasoning. A comprehensive understanding of these factors and their interrelations has the potential to aid in the creation of interventions designed to increase prosocial behavior or decrease aggressive behavior. This could be done by teaching children to develop the reasoning and regulatory skills that motivate moral reasoning and subsequent behavior and by informing parents of the types of support they can give their children to scaffold the development of those skills.

Overall, there are numerous gaps in the literature on the relations between moral reasoning, children's emotion regulation, cognitive executive functioning, the quality of the mother-child relationship, and the cognitive support and stimulation offered by parents in the home environment. This study will integrate aspects of parental behaviors and practices with child psychological characteristics in a mediational model that includes aspects from areas of child study that have received little attention or no study at all as they relate to moral reasoning. In so doing, a more complete model of children's moral reasoning can be investigated and tested.

Though the actual interrelations between parental support, emotion regulation, executive function, and moral reasoning may be more complex than hypothesized in this

paper, an initial and parsimonious model is proposed in which both emotion regulation and executive function are directly and positively related to moral reasoning (see Figure 1). Further, it is hypothesized that emotion regulation and executive function are positively related to each other (e.g., Leerkes et al., 2008). It is thought that parental support is positively related to moral reasoning via mediational pathways. Specifically, it is hypothesized that parental cognitive stimulation and support is related to moral reasoning through the mediator of executive functioning and the quality of the mother-child relationship is related to moral reasoning through the mediator of emotion regulation.

## CHAPTER II

### METHODS

#### *Participants*

The current study used data from the first cohort of three cohorts of children engaged in an ongoing longitudinal study. This cohort was recruited from area child day care centers, the County Health Department, and the local Women, Infants, and Children program. Potential participants for cohort 1 were recruited at 2 years of age (cohort 1: 1994-1996) and screened using the Child Behavior Checklist (CBCL 2-3; Achenbach, 1991) completed by the mother in order to over-sample for externalizing behavior problems. Children were identified as being at risk for future externalizing behaviors if they received an externalizing T-score of 60 or above. Efforts were made to obtain approximately equal numbers of males and females. A total of 154 children were selected.

The sample included in the present report consists of 87 children (49 females, 38 males), all children who had completed laboratory visits at age 10 and had observational data available to be coded. The current study uses data from when participant children were age 10 ( $M = 128.6$  months,  $SD = 3.1$ ). The majority of the sample is White (57%) or Black (38%). Eighty-nine percent of mothers had at least some college education and 50% possess a college degree or higher; 62% of the mothers were married at the time of

data collection. Chi-square and t-tests were conducted to determine if the current sample differed from the sample at initial recruitment based on demographic characteristics; a chi-square test indicated that there was no group differences in participants' race,  $\chi^2(3, N = 154) = 5.65, p = .13$ , and 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 two laboratory visits and a home observation. Mothers were provided a detailed verbal description of the procedures at time of each visit and were asked to read and sign an informed consent form. 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. For the current study, three coded tasks from the 10-year laboratory visit and two questionnaires were used and are described below.

### *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..*

Children's moral reasoning was assessed by coding children's discussions of vignettes from videos of mother-child interactions in a laboratory task. Each mother-child interaction lasted approximately 10 minutes. In this task mothers and children engaged in

a discussion 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., a school project involving conflicting desires; another child cutting in line to get the last ticket to a movie). Moral reasoning task vignettes were taken from the Crick and Dodge (1996) social information processing task and the Schultz, Yeates, and Selman (1989) Interpersonal Negotiation Strategies Interview. A copy of these vignettes can be found in Appendix A.

The coding scheme used to score moral reasoning was developed by Eisenberg, Lennon, and Roth (1983) and has since been used in other studies of moral reasoning (Eisenberg et al., 1987; Miller, Eisenberg, Fabes, & Shell, 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 Table 1 for further detail on the levels of moral reasoning).

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.

Following scoring procedures used by Eisenberg et al. (1987), for the purpose of analysis, 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. In short, this means that children's moral reasoning scores are weighted. 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  $(.50 \times 3) + (.25 \times 5) + (.25 \times 6)$  for an overall score of 4.25. The overall score was used for data analysis. Intercoder reliability was established by having 20% of the mother/child interactions coded by a second trained coder. Weighted kappa values were used to assess reliability for all observational coding. The average intraclass correlation coefficient for all levels of moral reasoning was .96, no correlation coefficients for individual levels of moral reasoning were below .90.



Descriptions of each level of reasoning and common examples of children's responses can be found in Table 1; examples reference Story 2, the project story.

*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," "My child is empathic towards others; shows concern when others are upset or distressed") 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 a task, 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 function such as visual attention and inhibition as well (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 complete the configuration in the time allotted and in the minimum number of moves required to reproduce the configuration. 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). Achievement scores across all trials were summed to assess executive planning ability.

*Dyadic Relationship Quality.*

The quality of the mother-child relationship was defined by ratings of goal-directed partnership and affective mutuality and was coded from videos of mother-child interactions in two laboratory tasks. Both tasks are intended to be mildly to 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 holes in a “puzzle box” that obscured their view of the puzzle. Mothers could see the puzzle from an unobscured view at the back of the puzzle box (Eisenberg et al., 2001). In a second task mothers and children were asked to work together to write a speech about the child which the child would then give while an experimenter videotaped the child.

Goal-Directed Partnership and Affective Mutuality/Felt Security of the dyad in the two laboratory tasks were coded using 7-point rating scales. The coding scheme used the NICHD Study of Early Child Care Parent-Child Interaction Scales: Middle Childhood

(Owen, Ware, & Barfoot, 2000). 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. High levels of Affective Mutuality were characterized by shared emotion (both positive and negative); reciprocal joking, smiling, and eye contact; and high levels of emotionally supportive verbal and non-verbal communication. Intercoder reliability was established by having 20% of the mother/child interactions coded by a second coder. The average intraclass correlation coefficients for goal-directed partnership and affective mutuality across both tasks were .76 and .90, respectively. As expected, Goal-Directed Partnership and Affective Mutuality were highly related ( $r = .69, p < .01$ ) and so were summed into a single measure indexing the quality of the mother-child relationship. Coding instructions and definitions appear in Appendix B.

*Parental cognitive stimulation and support.*

The cognitive stimulation and support offered by parents was defined by ratings of cognitive stimulation and parental support of children's autonomy and was coded from videos of mother-child interactions in the same laboratory tasks in which the quality of the mother-child relationship was assessed.

Cognitive Stimulation and Support of Autonomy were coded using 7-point rating scales. The coding scheme used the NICHD Study of Early Child Care Parent-Child Interaction Scales: Middle Childhood (Owen, Ware, & Barfoot, 2000). High levels of Cognitive Stimulation were characterized by frequent use of examples to explain

concepts, introduction of new and relevant information to the task, and encouragement of planning and problem solving by the parent. High levels of Support of Autonomy were characterized by the parent encouraging the child to be an active participant in the interaction, respecting the child's desire to act independently, and generally being supportive of the child's independent problem solving efforts. Intercoder reliability was established by having 20% of the mother/child interactions coded by a second coder. The average intraclass correlation coefficients for Cognitive Stimulation and Support of Autonomy across both tasks were .75 and .84, respectively. As expected, Cognitive Stimulation and Support of Autonomy were highly related ( $r = .37, p < .01$ ) and so were summed into a single measure indexing overall cognitive support and stimulation. Coding instructions and definitions appear in Appendix C.

#### *Data Analytic Strategy*

First, the data were analyzed for patterns of missingness. Second, descriptive and correlational analyses for all study variables were conducted. Third, path analyses evaluating the hypothesized model and comparative models are tested. Path analysis provides a useful tool for evaluating multiple direct and indirect relations simultaneously in a hypothesized model. It must be noted, however, that path analysis is also bound by the same limitations as ordinary least squares regression; among these are the assumptions that variables are measured without error, that error terms are not related, and that relations among variables are unidirectional (i.e., causal) (Pedhazur, 1997). As is common in developmental and non-experimental research, our analyses violate these assumptions.

## CHAPTER III

### RESULTS

#### *Missing Data*

Four participants were missing measures of emotion regulation and three were missing measures of executive functioning. The largest amount of missing data came from home observations of cognitive stimulation and support (11 cases). This data was missing completely at random (MCAR) when compared to participants not missing data at the 10-year data collection for the current analyses; Little's MCAR test,  $\chi^2(60, N = 87) = 63.95, p = .34$ . Because data was MCAR listwise deletion of cases was a viable option for dealing with the missing data. Listwise deletion, however, would decrease power to detect significant relations; because newer imputation procedures such as expectation maximization are appropriate for both MCAR and missing at random data (Buhi, Goodson, & Neilands, 2008) this method was selected to maintain the sample size.

The expectation maximization (EM) method from SPSS was used to impute remaining missing data from all available information. The following results were highly consistent with results obtained using the default maximum likelihood estimation (MLE) procedures in AMOS, which was expected given that both imputation methods use similar procedures. One advantage of imputing missing data is that bootstrapping procedures to test the significance of indirect effects are possible; AMOS cannot perform bootstrapping procedures with missing data.

### *Preliminary Analyses*

Means, standard deviations, and ranges for all study variables are presented in Table 2. In order to evaluate the need for controlling demographic variables three separate analyses of variance were conducted for child sex and moral reasoning, child race and moral reasoning, and maternal education and moral reasoning. Moral reasoning scores did not differ by either race or sex and so these variables were excluded from further analyses; there were significant differences in moral reasoning based on maternal education,  $F(4, 84) = 2.57, p = .04$ . Because significant differences in moral reasoning were based on maternal education it was included as a control variable in all analyses.

Descriptives of the unweighted moral reasoning scores give a sense of children's levels of reasoning; the most common type 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 some amount of non-hedonistic/needs of others reasoning. Although higher levels of reasoning were used far less commonly, they were used to some extent; 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 the highest level of reasoning, strongly internalized values.

Correlations among study variables are presented in Table 3. We found that moral reasoning was positively correlated with both child factors (emotion regulation and executive functioning) and with the quality of the mother-child relationship. The two child factors of emotion regulation and executive functioning were unrelated while the two parental factors of cognitive support and quality of mother-child relationship were positively related. Many of these associations were reduced, however, when maternal education was controlled.

### *Substantive Analyses*

Prior to testing the hypothesized model, a series of path analyses were conducted to test the relations among parental, parent-child, and child factors to moral reasoning using guidelines suggested by Stage, Carter, and Nora (2004). This series of models was intended to build evidence for the hypothesized direct and indirect relations among the study variables (i.e., that child factors would mediate the relations between parenting characteristics and children's moral reasoning). The models tested include a direct effects model, a "full" model (direct and indirect effects from parenting characteristics), an indirect effects model (the hypothesized model), and a child-driven model (child characteristics are mediated by parental characteristics). In all models maternal education is controlled for though not pictured in the figures. Each model and its results are reviewed in detail.

First, a direct paths model was tested; this is the simplest model positing that both parent and child characteristics are directly related only to moral reasoning. With all

variables in the model, only executive functioning was significantly related to moral reasoning; direct model results are presented in Figure 2.

The other tested models all evaluate indirect effects as well as direct effects. Bootstrapping procedures provide reliable estimates of indirect relations for small samples and the power to detect significant relations that normal procedures may not. As noted by Shrout and Bolger (2002), bootstrapping procedures can still be used to test indirect relations even when there is no bivariate relation between the X and Y variables (e.g., cognitive stimulation and support and its relation to moral reasoning via the mediator of executive functioning). Following procedures outlined by Shrout and Bolger (2002), AMOS bootstrapping procedures using 2000 samples with replacement were used to assess indirect relations in subsequent models.

The second model (Figure 3) tested both direct and indirect relations of parental characteristics and direct relations of child characteristics to moral reasoning. This “full” model was tested as the main comparison model for the hypothesized model in order to answer the questions of whether direct relations between parental characteristics are needed to predict children’s moral reasoning or if relations between parental characteristics and moral reasoning are fully mediated by child characteristics. The quality of the mother-child relationship was directly related to children’s emotion regulation but not their moral reasoning. Cognitive support and stimulation was not directly related to either executive functioning or moral reasoning. In this model only children’s executive functioning was directly related to moral reasoning. Table 4 presents



results for indirect effects for this model. Bootstrapped results for indirect effects indicated that there were no mediated pathways to moral reasoning.

The third model tested was the hypothesized model in which parental characteristics are indirectly related to moral reasoning via child characteristics. Figure 4 presents the direct effects among the model variables. The quality of the mother-child relationship was positively related to children's emotion regulation. Cognitive support and stimulation, however, was not related to children's executive functioning. Executive functioning was positively related to moral reasoning. Estimates of indirect effects for the hypothesized model can be found in Table 5. The quality of the mother-child relationship was positively, indirectly related to moral reasoning via the mediator of emotion regulation, though the indirect effect was only marginally significant ( $p = .09$ ). There were no other significant or marginally significant mediational pathways to moral reasoning.

The final model, the child-driven model, assesses the possibility that the relations between child characteristics and moral reasoning are mediated by parental characteristics (Figure 5). Children's emotion regulation was directly related to the quality of the mother-child relationship but not moral reasoning. Executive functioning was directly related to moral reasoning but not parental cognitive support and stimulation. Neither the quality of the mother-child relationship nor cognitive support and stimulation were directly related to moral reasoning. Finally, there was some evidence that emotion regulation may be mediated rather than a mediator; recall that when direct effects were included in the models relating parental characteristics to moral reasoning

emotion regulation was not a significant direct predictor but was only significant when it served as a mediator and no direct effects were included. As Table 6 indicates, testing the child-driven model indicated that the quality of the mother-child relationship did not mediate the relation between emotion regulation and moral reasoning; emotion regulation seems to fit best as a mediator between the quality of the mother-child relationship and moral reasoning although, as noted, the mediational effect was marginal.

In evaluating the overall model we selected several measures of model fit and compared our hypothesized model to each of the alternate models. The measures of fit include the Root Mean Square Error of Approximation (RMSEA), Normed Fit Index (NFI), and Parsimony-adjusted Normed Fit Index (PNFI) (a version of NFI that applies parsimony adjustment in which overly complex models are penalized; higher values indicate a better fit) (Mulaik et al., 1989). Comparative models in these analyses included the direct effects model (predictor variables directly related only to moral reasoning, a full model (each observed parental variable directly related to both child variables and moral reasoning), the hypothesized model (parental characteristics are related indirectly to moral reasoning via child characteristics), and a child-driven model (child variables directly related to moral reasoning via direct and indirect paths through parental variables). These comparisons are presented in Table 7. The direct model clearly did not fit the observed associations in the data well. The full model also provided a poor fit to the data; including both direct and indirect effects from the distal factors of parental characteristics did not improve description. The hypothesized and child-driven models had the same levels of fit; both had non-significant chi squares and matching RMSEA

values. Other indexes of fit were also highly similar; both offered adequate explanatory mechanisms for the data (as indicated by RMSEA, CFI, and NFI). The hypothesized model, however, explained about twice as much variance as the child-driven model due to the direct relation between executive functioning and moral reasoning. Thus, the hypothesized model was accepted as the best and simplest representation of the data.

## CHAPTER IV

### DISCUSSION

The purpose of the current study was to delineate the mediational processes by which parental and child characteristics are related to moral reasoning for children in middle childhood. Specifically, a hypothesized mediational model and comparative models were tested to assess whether a) children's emotion regulation and executive functioning are directly related to moral reasoning; b) emotion regulation mediates the relation between quality of the mother-child relationship and moral reasoning; and c) executive functioning mediates the relation between cognitive support and stimulation and moral reasoning. Although maternal education was not hypothesized as part of the model it was included as a control because it was correlated with nearly every study variable.

Several competing models were evaluated in this study: a direct effects model, a "full" model (both direct and indirect effects), the hypothesized model (indirect effects only from parental characteristics), and a child-driven model (direct effects and indirect effects via parental characteristics). The direct effects and full models were discarded because they provided poor fits to the observed associations in the data. The full and child-driven models provided adequate levels of fit. Although the child-driven and hypothesized models provided the same levels of fit, the hypothesized model was selected because it explained the most variance in the dependent variable, moral

reasoning. Further discussion of the results is focused on the hypothesized model, referencing the other models as a comparison when necessary.

Regarding the hypothesized positive relation between the child characteristics of emotion regulation and executive functioning, no significant association was found. This finding is somewhat inconsistent with findings with younger children that the two constructs are related (e.g., Leerkes, Paradise, O'Brien, Calkins, & Lange, 2008). One possible explanation is that in the current study executive functioning was primarily assessed using a measure of planning rather than inhibitory control. It is possible that executive planning relies less heavily on the same processes that underlie emotion regulation as compared to other executive abilities such as inhibitory control.

Consistent with prior research findings that emotion regulation is positively related to morally related emotions and behaviors (Fabes, Eisenberg, Karbon, Troyer, & Switzer, 1994; Spinrad et al., 1999; Ungerer, Dolby, Waters, Barnett, Kelk, and Lewin, 1990), we found that emotion regulation and moral reasoning were positively related; this relation disappeared, however, when maternal education was controlled for. Also consistent with other research (e.g., Cole, Teti, & Zahn-Waxler, 2003; Davidov & Grusec, 2006; Eisenberg, Fabes, & Murphy, 1996; Garner, 2006), we found that the quality of the mother-child relationship was positively related to children's emotion regulation.

These findings suggest that a high quality mother-child relationship may facilitate children's emotion regulation skills which, in turn, are related to moral reasoning. In the current study high quality mother-child relationships were characterized by shared affect

and shared goal-directed task engagement. These types of mother-child interactions may provide children with opportunities to learn how to self-regulate via co-regulation. 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 or control their negative emotions. Shared affect in high quality relationships may also help children to learn emotion regulation strategies. During stressful tasks mothers often helped their children to find the amusing aspects of the situation rather than focusing on the stressful aspects. These emotion regulation strategies may be adopted by children who have high quality mother-child relationships.

Emotion regulation may facilitate moral reasoning by helping children to up-regulate positive feelings in social interactions (e.g., feelings of closeness or compassion that may stimulate more in depth perspective taking of the other's situation, thought about costs and benefits of selfish action, and consideration of how to plan a mutually beneficial outcome). In situations involving self-sacrifice in order to help, down-regulation of negative emotion may allow children to suppress feelings of annoyance or personal distress in order to deal with moral situations more effectively. Additionally, emotion regulation may allow children to suppress the urge to satisfy their own desires and take the desires of others into account. It is important to note, however, that maternal education also plays some role in these relations. In this study maternal education was controlled for but it may well be that maternal education is part of the mediated link to moral reasoning. For example, higher levels of education are related to knowledge about

how to interact successfully with children and form positive relationships, positive relationships facilitate the development of children's emotion regulation, and emotion regulation facilitates moral reasoning.

Though no research has specifically investigated links between executive functioning and moral reasoning, our finding that these two factors are positively linked is generally consistent with research finding positive links between executive functioning and prosocial behavior (Eisenberg, Fabes, Karbon, et al., 1996; Moore, Barresi, & Thompson, 1998) and negative links to violent fantasies and aggressive play with peers (Dunn & Hughes, 2001). No research has linked the cognitive support and stimulation provided by parents to executive functioning; nevertheless, we were surprised that there was no significant association between these two factors. 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. Executive function, especially executive function as measured in this study (i.e., planning), likely helps children in these reasoning processes. Children who are good at planning can employ those same abilities to help them reason through and plan actions in morally ambiguous situations. In this study we were not successful in identifying the parental characteristics that are positively related to children's executive functioning.

Given the lack of research on moral reasoning, especially the cognitive aspects involved in moral reasoning, it is not surprising that prior studies have not investigated

mediational processes in regards to the factors involved in the current study. As stated earlier, in assessing mediation there are typically three steps that are taken. First, the relation between the independent variable and the dependent variable should be significant. Second, the relation between the independent variable and the mediator should be significant. Third, the relation between the mediator and the dependent variable should be significant (Baron & Kenny, 1986). Typically, full mediation is declared when the independent variable is no longer a significant predictor when the mediator is included; partial mediation could be claimed when the mediator is included but the independent variable is still a significant predictor but reduced in strength. By assessing mediation with multiple paths, we allowed other relations besides those in a specific mediational path to account for the reduced strength between the independent variable and the dependent variable. As an example, in the direct effects model only executive functioning was a significant predictor of moral reasoning despite significant bivariate associations between most of the variables and moral reasoning.

Consistent with traditional methods of testing mediation, there were significant bivariate associations between the quality of the mother-child relationship and moral reasoning and between quality of the relationship and emotion regulation. We found a marginally significant indirect effect for the quality of the mother-child relationship on moral reasoning via emotion regulation (after controlling for maternal education). Given the marginally significant finding, it is likely that the link between the quality of the mother-child relationship and moral reasoning is partially mediated by children's emotion regulation. Although the evidence is not causal, this mediated link suggests that the



hypothesized relations among the quality of the mother-child relationship, child emotion regulation, and moral reasoning are possible; mothers may socialize children's emotion regulation skills which are then used in situations requiring moral reasoning. While it is possible to estimate the proportion of an effect that is mediated (the indirect effect divided by the total effect) this requires very large sample sizes in order to accurately estimate the standard error (MacKinnon, Warsi, & Dwyer, 1995) and was not done in this study. We found no other evidence of mediation in the variables used in the current study; contrary to hypotheses, parental cognitive stimulation and support was not indirectly related to moral reasoning via children's executive functioning.

In summary, the current study used theoretically driven hypotheses derived from structural-developmental and socialization theories of moral reasoning together to formulate a model in which parental characteristics were indirectly related to moral reasoning via child psychological characteristics. In testing the study hypotheses we found significant direct relations between children's moral reasoning and children's executive functioning as well as a marginal indirect relation from the quality of the mother-child relationship via emotion regulation. This study used non-overlapping methods, primarily observations of mother-child interactions, the home environment, and child tasks, which eliminates the potential to find significant relations due to mono-method bias. To our knowledge, this is the only study to assess mediational pathways involving both parental and child characteristics to moral reasoning. In addition to positing a mediational model to understand children's moral reasoning, we tested

plausible alternate models as well. Additionally, this study makes a unique contribution in that no studies have evaluated the role of executive functioning in moral reasoning.

There are limitations to the study, however. First, the sample used in this study was relatively small. Second, these results may only be generalizable to children in late middle childhood; it is possible that the relations found in this study may not hold for 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 peer situations). Unexpected suppression effects limit our ability to draw conclusions regarding the indirect influences of the cognitive support and stimulation that parents provide to children in their home environments.

Future research in this area could move our base of knowledge forward by exploring other mediational models involving both parents and children (i.e., both socializing and structural characteristics). Future research should also evaluate these mediational processes longitudinally. Additionally, potential moderators should be considered within these mediational processes. It may be that the processes that lead to moral reasoning may be different in direction or strength based on certain demographic characteristics. For example, it is possible that these processes differ by or depend upon child sex, family SES, parental education, or other characteristics.

Finally, it is important that moral reasoning be evaluated in contexts that are both immediate and relevant to children (e.g., moral reasoning in situations involving a peer or a friend who is present in an interaction). Reasoning in such situations should be contrasted with children's moral reasoning in less immediate contexts, as in the

assessment used in the current study. 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 understand how best to apply this knowledge in the formulation of socially beneficial programs and in informing parents on how they can raise morally conscious children.

Table 1.

*Detailed Description of the Levels of Moral Reasoning and Examples.*

<p>1 Appeal to authority</p>	<p>The individual is concerned with self-oriented consequences rather than moral considerations. Rather than deciding on an action the individual defers to authority in situations or appeals to an authority figure to resolve situations and conflicts.</p>	<p>Preschoolers and younger elementary school children</p>	<p>“I would tell the teacher and she would tell them that we should do my idea.”</p>
<p>2 Hedonistic, self-focused</p>	<p>The individual is concerned with self-oriented consequences rather than moral considerations. Reasons for assisting or not assisting another include consideration of direct gain to self, future reciprocity, and concern for others who the individual needs and/or likes (due to the affectional tie).</p>	<p>Preschoolers and younger elementary school children</p>	<p>“I would do my idea for looking at the animals.”</p>
<p>3 Needs of others/ non-hedonistic</p>	<p>The individual expresses concern for the physical, material; and psychological needs of others even though the other's needs conflict with one's own needs. This concern is expressed in the simplest terms, without clear evidence of self-reflective role taking, verbal expressions of sympathy, or reference to internalized affect such as guilt.</p>	<p>Preschoolers and elementary school children</p>	<p>“We could do the project about the animals that live in the jungle.”</p>

4 Approval and interpersonal and/or stereotyped	Stereotyped images of good and bad persons and behaviors and/or considerations of others' approval and acceptance are used in justifying prosocial or nonhelping behaviors.	Elementary and high school students	“My teacher would think it was nice if we did the project by sharing.”
5 a Empathic b Transitional (empathic and internalized)	a) The individual's judgments include evidence of sympathetic responding, self-reflective role taking, concern with the other's humanness, and/or guilt or positive affect related to the consequences of one's actions. b) Justifications for helping or not helping involve internalized values, norms, duties, or responsibilities, or refer to the necessity of protecting the rights and dignity of other persons; these ideas, however, are not clearly stated.	Older elementary school and high school students  Minority of people high school age	“I would be disappointed if I had to do a project about something I didn't like so I think it would be good if we could talk about how we could work together.”
6 Strongly internalized	Justifications for helping or not helping are based on internalized values, norms, or responsibilities, the desire to maintain individual and societal contractual obligations, and the belief in the dignity, rights, and equality of all individuals. Positive or negative affect related to the maintenance of self-respect for living up to one's own values and accepted norms also characterizes this stage.	Only a small minority of high school students and virtually no elementary school children	“It's not right to make someone do what you want them to do. I would feel bad. I think we should both have a part of the project that is interesting.”

Table 2.  
*Means, Standard Deviations, and Ranges for Study Variables.*

Variable	Mean	SD	Range
Moral Reasoning	2.08	.44	1 – 4.11
Emotion Regulation	3.34	.39	2.25 – 4
Executive Functioning	10.62	2.49	3 – 16
Mother-child Relationship	10.08	1.22	6 – 13.5
Cognitive support	9.94	1.08	6 – 12

Table 3.  
*Correlations for Study Variables.*

	1	2	3	4	5
1. Moral Reasoning	-				
2. Emotion Regulation	.24* (.17)	-			
3. Executive Functioning	.22* (.23*)	.05 (.05)	-		
4. Mother-child Relationship	.22* (.12)	.44* (.35*)	-.09 (-.10)	-	
5. Cognitive support	.16 (.07)	.17 (.04)	.09 (.09)	.62* (.54*)	-

\* denotes  $p < .05$ . Partial correlations controlling for maternal education are given in parentheses.

Table 4.  
*Indirect Effects for the Full (Direct and Indirect Paths) Model.*

	Bootstrap bias corrected estimates			
	<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>p</i>
Mother-child relationship – Moral reasoning	.016	.017	-.008, .053	.284
Cognitive support – Moral reasoning	.008	.019	-.013, .045	.449

Table 5.  
*Indirect Effects for the Hypothesized Model.*

	Bootstrap bias corrected estimates			
	<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>p</i>
Mother-child relationship – Moral reasoning	.021	.015	.000, -.012	.089
Cognitive support – Moral reasoning	.007	.016	-.242, .042	.442

Table 6.  
*Indirect Effects for the Child-Driven Model.*

	Bootstrap bias corrected estimates			
	<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>p</i>
Emotion regulation – Moral reasoning	.041	.038	-.021, .104	.242
Executive functioning – Moral reasoning	.001	.004	-.005, .009	.873



Table 7.  
*Comparison of Hypothesized and Alternate Models.*

	Chi square	<i>df</i>	<i>p</i>	RMSEA	NFI	PNFI
Direct	19.23	6	<.01	.16	.83	.33
Full	7.47	4	.11	.10	.93	.25
Hypothesized	8.23	6	.22	.07	.93	.37
Child-driven	8.23	6	.22	.07	.93	.37

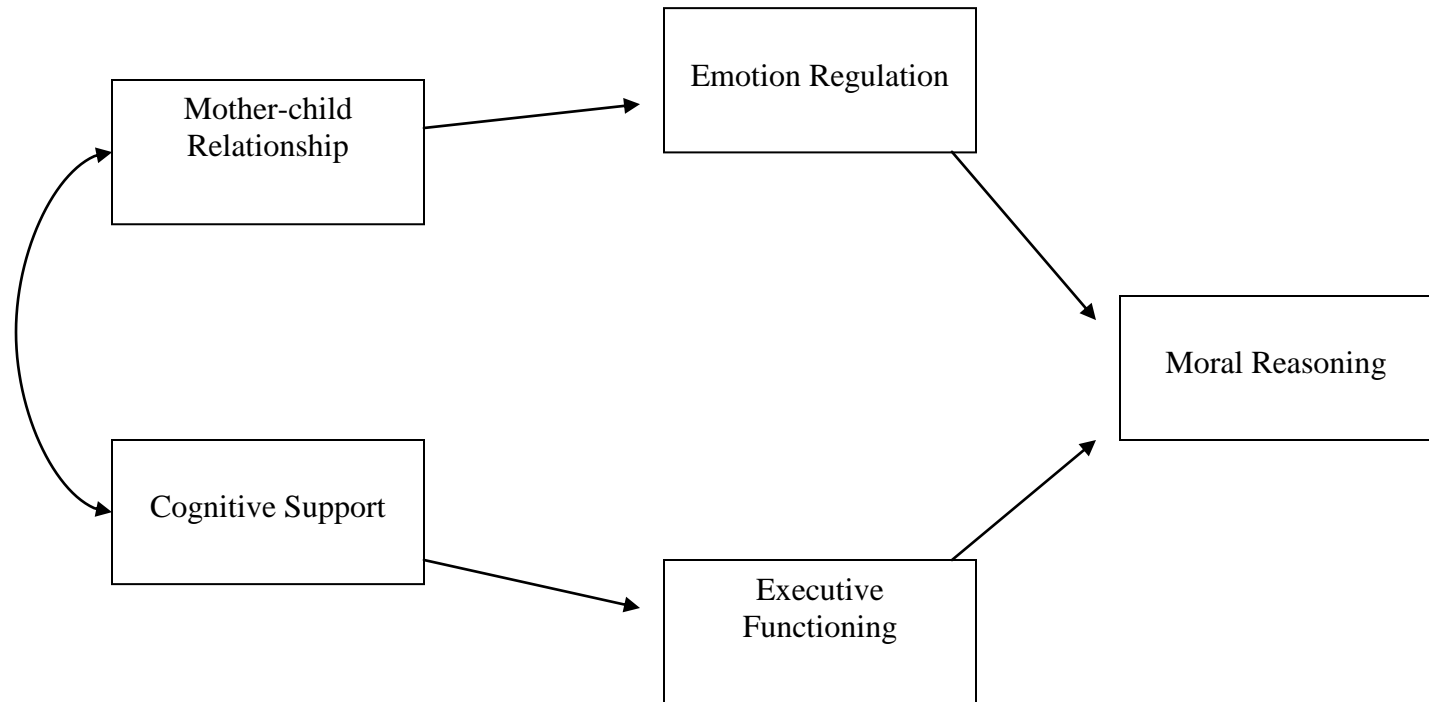


Figure 1. Hypothesized relations among the study variables.

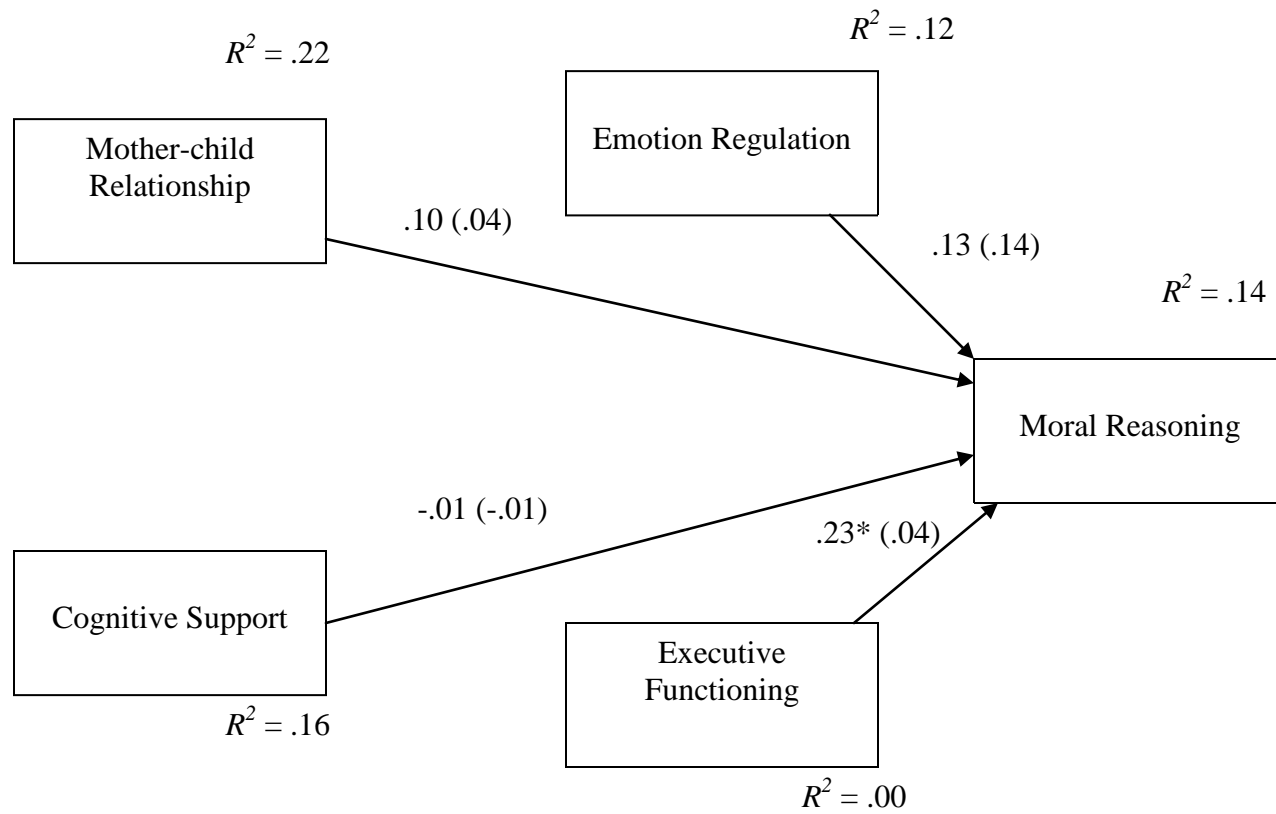


Figure 2. Path model of relations among study variables for the direct model. \* denotes  $p < .05$ . Unstandardized coefficients are given in parentheses.

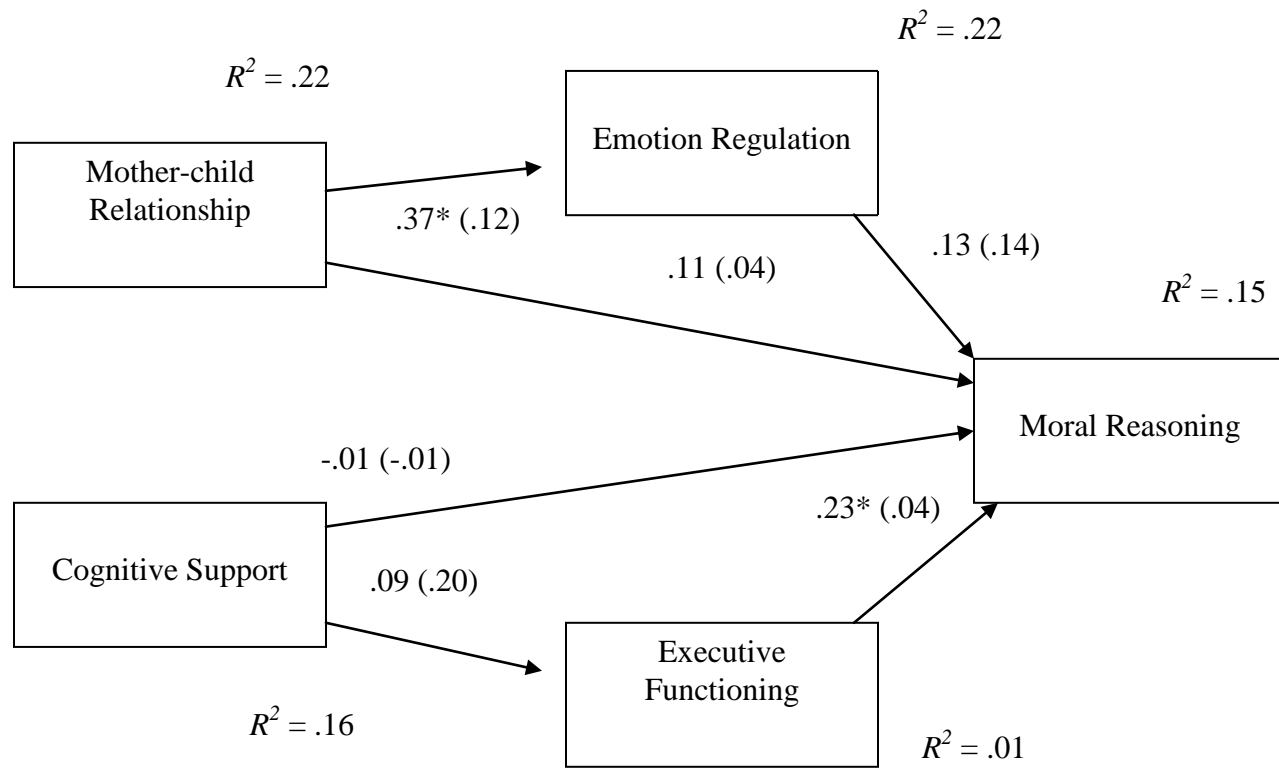


Figure 3. Path model of relations among study variables for the full model. \* denotes  $p < .05$ . Unstandardized coefficients are given in parentheses.

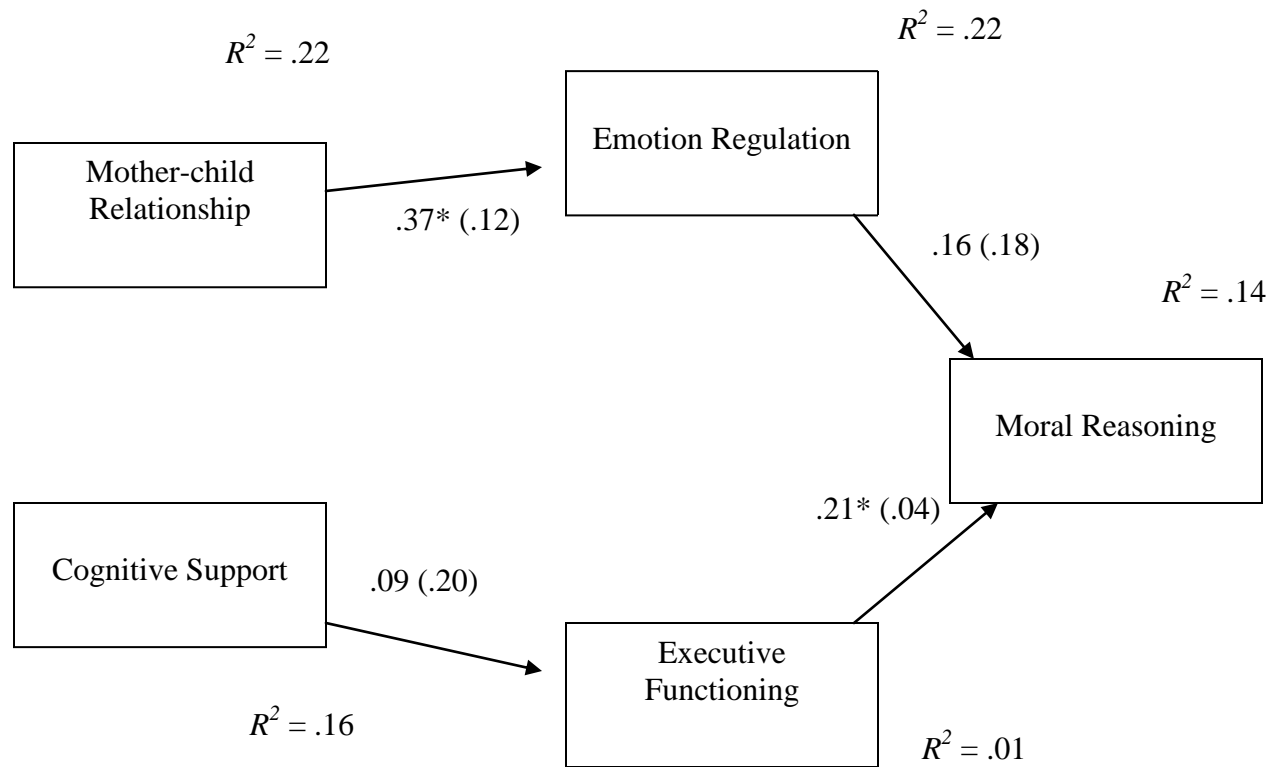


Figure 4. Path model of relations among study variables for the hypothesized model. \* denotes  $p < .05$ . Unstandardized coefficients are given in parentheses.

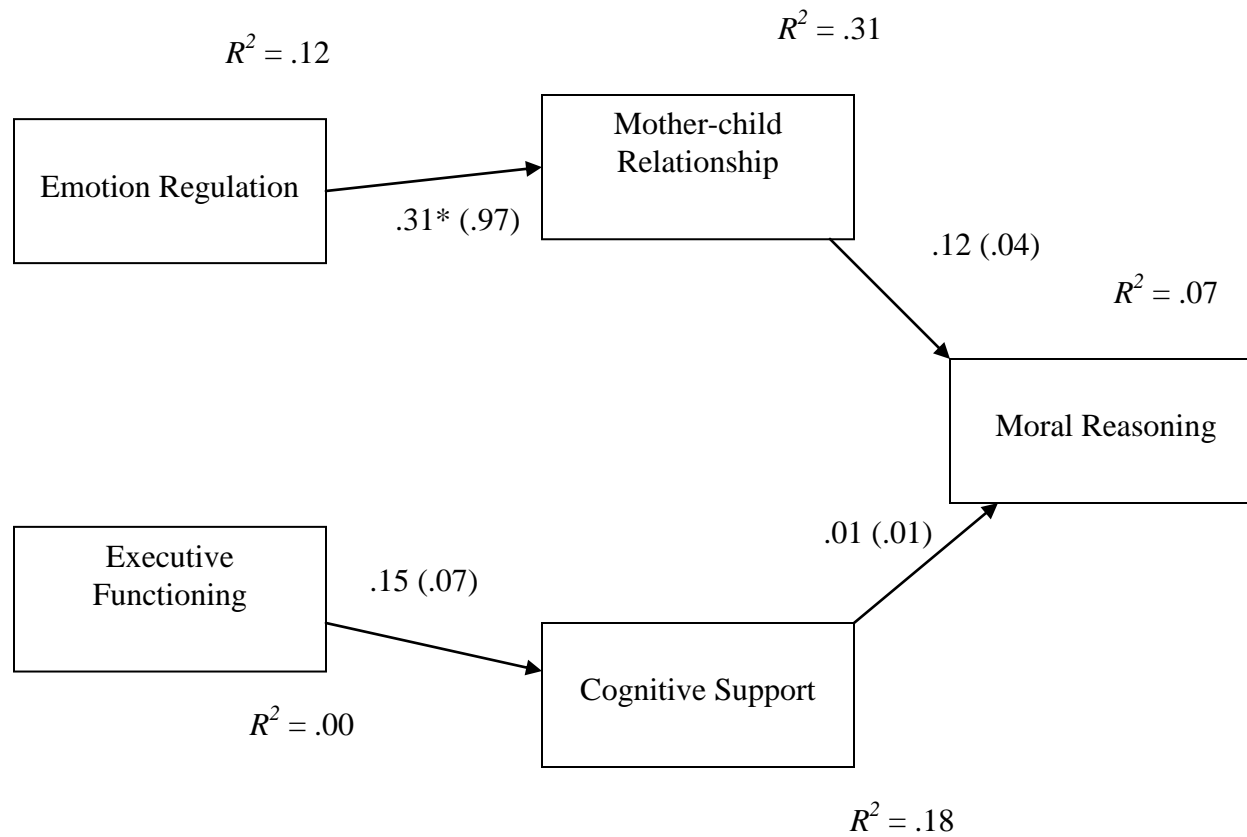


Figure 5. Path model of relations among study variables for the child-driven model. \* denotes  $p < .05$ . Unstandardized coefficients are given in parentheses.

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## APPENDIX A

### MORAL REASONING VIGNETTES

Vignette 1: Christopher/Christina is at lunch at school one day looking for a place to sit. He/she sees kids he/she knows at a table across the room. The kids are laughing and talking to each other and they look like they are having a good time. Chris goes over to their table, sits down, and says “hi” to everyone. The kids look right at him/her, roll their eyes, and don’t say anything to him/her. After a few seconds, the kids start talking to each other, but no one talks to Chris at all. What should Chris do?

Vignette 2: Bob/Debbie and Steve/Anne are classmates. They don’t know each other very well, but their teacher has assigned them to work together on a social studies project about Africa, and they are trying to decide on a topic. Bob/Debbie wants to do the report on wild animals, but Steve/Anne wants the report to be about the different areas of Africa, like the desert and jungle. What should Bob/Debbie and Steve/Anne do?

Vignette 3: Andy/Andrea is standing in the hallway one morning before school. As he/she is standing there, two kids from his/her class walk by. Although they are whispering, Andy/Andrea overhears them say something mean about him/her to each other. As they walk by, the two kids look at Andy/Andrea and then laugh as they walk down the hall. What should Andy/Andrea do?

Vignette 4: One day a new kid in class named Don/Denise says he’s/she’s cold and asks Jeff/Peggy to lend him/her a sweatshirt that Jeff/Peggy has but isn’t wearing. The next day when Don/Denise returns the sweatshirt there’s a hole in it that Jeff/Peggy is sure wasn’t there the day before. What should Jeff/Peggy do?

Vignette 5: At the movie theater one day, Allen/Amanda wants to buy a ticket for a new movie he/she really wants to see. He/she knows there aren't many seats left for the show he/she wants to go to. Just as he/she gets into the line, a bigger kid that Allen/Amanda knows from school, says, "I want this spot." Then the kid cuts into line in front of Allen/Amanda. The bigger kid gets the last ticket to see the movie that Allen/Amanda wanted to see. What should Allen/Amanda do?

Vignette 6: Jimmy's/Bonnie's class has a substitute teacher named Mr. Jones for the day. Jimmy/Bonnie is working on some difficult math problems that he/she is supposed to finish before lunch. He/She needs some help from Mr. Jones, but Mr. Jones is very busy with other kids in the class. What should Jimmy/Bonnie do?

## APPENDIX B

### MOTHER-CHILD RELATIONSHIP CODING

#### *Goal-Directed Partnership*

This scale measures the extent to which the dyad evolves and shares a common goal which has the underlying purposes of providing self esteem enhancing and learning experiences for the child. One of the overriding tasks is for the rater to keep in mind if there is a goal present and if the goal is adaptive. Essential to this scale is the sense that both members are working together, are engaged, and their behavior is interdependent. At the high end of this scale the behavior of the dyad is organized throughout with lots of positive feedback loops. At the low end of the scale we see disengagement or disparity in involvement.

7. Very High. Parent calibrating his/her behavior to the child, lots of reciprocal verbal or non-verbal communication, parent making encouraging statements, parent expecting the child to perform the task, child expecting assistance as needed from the parent, a stable goal that changes one at a maximum in response to child frustration or success, active problem solving behaviors and communication, some conflict or frustration is fine. The child is attentive to the parent and there is a high degree of cooperation and engagement. Behavior is highly interdependent between the two for a solid partnership.

1. Very Low. These dyads are maladaptive. There is noticeable confusion, child may appear to take control of the interaction or look passive. Parent may look very disinterested and passive even if the child looks involved. There is often a one-sidedness

to the interaction, stress makes organization fall apart and not return. Negative feedback loops are common, frequent task changes without resolution or feedback on previous ones. As goals change they become very distal to original. There may be a “you do yours, I’ll do mine” type of disengagement. There is no sense of partnership or working together.

### *Affective Mutuality*

This scale assesses availability and mutuality of emotion between the child and parent and how secure the child feels with the parent. There is an emphasis on the child having a sense that the parent has his/her own best interests in mind. There is also an emphasis on verbal and non-verbal communication, what the parent and child communicate and how they do it. Open and free communication will be marked by emotion exchanged and a sense of personal involvement and engagement. The child appears free to express positive or negative emotions or feelings. Availability of affect is also marked by the parent’s tone of voice communicating warmth and regard for the child. At the low end, closed communication or lack of mutuality will be reflected in interaction that is stifled or non-reciprocal. At the low end there may be a veneer of intimacy or mutuality covering an impoverished experience; emotional experience of the parent may be quite different from the experience of the child. The rater must be alert to exchange of emotion and the subtle cues that reflect this. Essentially we are interested in behaviors which reflect on intimacy in the dyad.. Dyads high on this scale almost always have a moment of shared emotion that is pleasurable. At the low end we see stifling of emotion, dampening behaviors which avoid or negate expression of emotion, or lots of

conflict between the parent and the child. The rater will need to distinguish between affect that is muted because of parent's focus on task (but which still regards child's feelings) and that which has as its purpose to stifle expression.

7. Very High. There is a sense that experiences (both positive and negative) are shared, that the parent shows a response to the child's emotion and vice versa. Smiling back and forth takes place. Eye contact occurs when the child or parent seeks it. There may be personal exchanges such that the child uses "I" statement to talk about feelings. First person pronouns are used. There may also be physical proximity seeking behaviors, help seeking, or some reflection on the experience with the activities (e.g., "this is hard" or "this is silly"), that are responded to in a fashion that supports the mutuality observed in the dyad. There are almost no "dampening" behaviors by either partner, so that emotion and communication flows freely. There is at least one sustained bout of reciprocally communicated, positive emotion shared by the partners.

1. Very Low. There are three possibilities.(1) the dyad appears disengaged or can only engage around positive experiences and there is an almost staged like quality to those; (2) there is underlying conflict or ambivalence apparent (parent may make it clear he or she would rather be somewhere else); or (3) parent and child have very little coordinated emotion and appear emotionally disconnected with each other. Parent or child may express a positive emotion that is not coordinated with behavior and the other one responds. There may be underlying tension in the interaction. Parent may be threatened by any negative emotion. Dampening statements may not even be common since this dyad may essentially be disengaged around emotion. There is very little

attention to each other in terms of warmth or personal involvement. One may also see a parent giving derogatory glances at the child, directly or indirectly communicating displeasure with the child and/or his/her performance. There is often a veneer of intimacy or a staged-like interaction masking an impoverished experience for the parent and child.



## APPENDIX C

### COGNITIVE SUPPORT CODING

#### *Cognitive Stimulation*

This scale measures the degree to which the parent tries to foster his/her child's cognitive and mental development. A stimulating parent may take advantage of any activity to stimulate development. He/she will instruct the child and/or engage the child in a variety of explicit activities with the intent to facilitate learning, development and achievement.

Highly stimulating parents use analogies, explain concepts, encourage autonomous problem-solving, and expand on or use the context to teach certain concepts and to illustrate ideas. Behaviors include: (a) suggesting or encouraging more sophisticated problem-solving strategies (e.g., "What aspects of the errand list will influence the order in which we take care of the errands?") (b) pointing out or asking the child about exceptions to the more obvious "black-and-white" approaches to certain rules or issues (e.g., "So you think it's never okay to tattle, but I wonder if there are any situations in which it *would* be okay."), (c) encouraging high-level planfulness or consequential thinking in the child, and (d) encouraging the child to generate more than one effective solution to problems (e.g., "You put that card at the end of the sequence. Do you think it could go anywhere else?" or "What would be another route we could take and still get these three errands done?"), (e) teaching or encouraging perspective-taking skills or other sophisticated social skills (e.g., "What do you think that would be like for me if you got into trouble at school and I didn't know about it?"), and (f) applying the

tasks or materials to concepts that the child may be currently learning at school (e.g., “So there are three stories and six cards per story; how would you figure out how many cards there are without simply counting each one?” or “You’re learning about communities in school right? Well, what other buildings might you find on a town map that aren’t included on this one?”)

7. Very High. Parent provides cognitive stimulation that clearly seeks to stimulate a higher level of mastery, understanding, or sophistication and does so several times, indicating that he or she is taking advantage of this activity as a learning experience for the child.

1. Very Low. Parent provides no cognitive stimulation. The parent makes no attempt to stimulate or teach the child anything. He/she either is totally uninvolved or fails to provide any information about the activities or situation.

#### *Support of Child's Autonomy*

This scale reflects the degree to which the parent acted in a way that recognizes and respects the validity of the child’s individuality, motives, and perspectives in the session. A parent scoring low in this scale would be very intrusive in his/her interventions with the child exerting his/her expectations on the child in a way that makes the child a satellite or servant of the parent rather than a partner in a mutually negotiated relationship; or the parent might implicitly define his/her interactions in terms of a win-lose power struggle in which compliance by the child makes the parent the winner and the child submissive.

Parents may intrude either harshly or with affection; in either case, his/her actions do not acknowledge the child's intentions as real or valid and communicate that it is better and safer to depend on him/her for direction than to attempt individuality. In contrast, a parent scoring high on this scale acknowledges the child's perspectives and opinions about the different family rules and ideas for the errand planning task as a valid part of the child's individual identity. A parent scoring very high does this explicitly by negotiating rules with the child, verbalizing his/her acknowledgment of the child's intentions and ideas, does not deny the child's right to those desires, and models his/her individuality, too. Note: Parent can get a low score just by denying the child's individuality strongly (e.g. interrupting the child, doing things before the child can on his/her own, not allowing child to express his/her own opinion) even though it is not interrupting the child's behavior.

7. Very High. Parent very clearly interacts with the child in a way that acknowledges the validity of the child's perspective, encourages the child to acknowledge his/her intentions and opinions, and to negotiate the course of interactions in the session. This parent also models his/her individuality to the child in these negotiated interactions and may insist on the importance of his/her interventions being followed, but he/she does so while acknowledging the reality and validity of the child's differing perspective and never in an intrusive manner.

1. Very Low. Parent completely denies the child's individuality in the techniques he/she uses. Parent is very intrusive, physical and forceful in controlling the child.