

The Relations Among Mothers' Personality, Parenting Behaviors, and  
Children's Regulation, Sympathy, and Prosocial Behavior

by

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## ABSTRACT

The purpose of this study was to examine whether maternal personality (i.e., Agreeableness and Conscientiousness) predicted maternal positive parenting (i.e., warmth/sensitivity and structure), and whether maternal parenting predicted children's regulation and sympathy and/or prosocial behavior. Additionally, the mediated effect of maternal warmth/sensitivity on the relation between maternal Agreeableness and children's regulation and the mediated effect of maternal structure on the relation between maternal Agreeableness and children's observed sympathy/prosocial behavior were investigated. Maternal personality was measured when children (N = 256 at Time 1) were 18 months old; maternal parenting was assessed when children were 18, 30, and 42 months old; children's regulation and sympathy/prosocial behavior (observed and reported) were assessed when children were 30, 42, and 54 months old. Mothers reported on their personality; maternal warmth/sensitivity was observed; maternal structure was observed and mothers also reported on their use of reasoning; mothers and caregivers rated children's regulation (i.e., effortful control [EC]) and regulation was also observed; mothers and fathers rated children's prosocial behavior; sympathy and prosocial behavior were also observed. In a path analysis, Conscientiousness did not significantly predict maternal warmth/sensitivity or structure at 30 months, whereas Agreeableness marginally predicted maternal warmth/sensitivity at 30 months and significantly predicted maternal structure at 30 months. Maternal warmth/sensitivity at 18 months significantly predicted 30-month EC, and 30-month maternal warmth/sensitivity significantly predicted 42-month EC. Maternal structure at 30 months significantly predicted 42-month observed sympathy/prosocial behavior. Maternal warmth/sensitivity at 42 months significantly

predicted 54-month observed sympathy/prosocial behavior and marginally predicted 54-month reported prosocial behavior. Maternal structure and EC did not significantly predict reported prosocial behavior across any time point. EC did not significantly predict observed sympathy/prosocial behavior across any time point and maternal warmth/sensitivity at 18 and 30 months did not predict observed or reported sympathy/prosocial behavior at 30 or 42 months, respectively. Maternal Agreeableness directly predicted 30-month reported prosocial behavior and additional paths suggested possible bidirectional relations between maternal warmth/sensitivity and structure. Mediation analyses were pursued for two indirect relations; however, neither mediated effect was significant. Additional results are presented, and findings (as well as lack thereof) are discussed in terms of extant literature.

## DEDICATION

*To my parents – Thank you for instilling in me a love of learning and the importance of education. Your unwavering love and belief in me has helped me to achieve my goals.*

*To Lillian and Roger Retallack – You have always been there with encouragement and cheers for my many mini-goals along the way. Roger, I finally finished my “paper!”*

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Prosocial behavior is considered an important aspect of moral development, as well as the basis of relationships (Staub, 1979). Indeed, children who are prosocial tend to be higher in social competence (including having positive peer relationships) and lower in aggressive and externalizing behaviors (Clark & Ladd, 2000; Denham & Holt, 1993; Eisenberg & Fabes, 1998; Eisenberg, Fabes, & Spinrad, 2006; Hastings, Zahn-Waxler, Robinson, Usher, & Bridges, 2000). People who were prosocial as children are less likely to be antisocial as adults (Hämäläinen & Pulkkinen, 1995). Sympathy is also an important aspect of moral development, and has been given a central role in promoting prosocial behavior (Batson, 1991; Staub, 1979). As such, it is necessary to study sympathy and prosocial behavior in order to obtain knowledge about what impacts the development of these constructs. More specifically, it is crucial that researchers examine the antecedents of sympathy/prosocial behavior; by understanding the predictors of sympathy/prosocial behavior, researchers can provide a more detailed picture of what impacts their development in children.

Studying the effects of parental personality and parenting behaviors on sympathy/prosocial behavior may provide useful insight because, as Belsky (1984; Belsky & Barends, 2002) pointed out, parenting has a genetic basis and it may be that personality (which is also genetically influenced) is an important contributor to the way that parents parent their children. In addition, children's outcomes may be based not only on the way that they are parented, but also on these precursors to parenting behaviors, such as maternal personality. In fact, Belsky and Jaffee (2006) suggested that parenting is related to children's behavior because genes that are passed on to children are at least partly responsible for parenting behaviors as well as children's behaviors; therefore, both

genetic and environmental effects could be influencing children's behaviors, both directly and indirectly (e.g., via parenting). Deater-Deckard and colleagues (e.g., Deater-Deckard, Dunn, O'Connor, Davies, & Golding, 2001; Deater-Deckard, Pike, et al., 2001) examined genetic and environmental effects on young children's prosocial behavior and suggested that genetics influence children's outcomes, but the process by which this happens may be through the genetic influence on the parent-child relationship (e.g., parenting). In a stepfamily design (e.g., looking at full- and half-siblings), Deater-Deckard, Dunn, et al. (2001) found that genetic influences (as well as shared environmental influences) on children's prosocial behavior were modest, but most of the variance accounted for in prosocial behavior was attributed to nonshared environment. Examining samples of only monozygotic twins, Deater-Deckard, Pike, et al. (2001) and Mullineaux, Deater-Deckard, Petrill, and Thompson (2009) provided additional, methodologically stronger support for the role of nonshared environmental influences (e.g., maternal parenting behaviors) in children's social-emotional outcomes (e.g., prosocial behavior). Therefore, although genes may influence children's behaviors, it is important to examine the effect of aspects of the environment (such as parenting) on children's outcomes, as researchers have shown that the environment (in this case, parenting) does influence children's outcomes.

The purpose of the current study was to examine the relations among certain dimensions of mothers' personality, positive maternal parenting behaviors, and children's regulation and sympathy/prosocial behaviors. This study focused on two dimensions of mother personality: Agreeableness and Conscientiousness. These two dimensions of personality were hypothesized to be most related to the predictors of sympathy/prosocial behavior (i.e., parenting and children's regulation; see Figures 1 and 2 for hypothesized

relations). Additionally, parenting behaviors were hypothesized to mediate the relation between personality and sympathy/prosocial behavior, as well as the relation between personality and regulation. Children's regulation was hypothesized to mediate the relation between parenting behaviors and sympathy/prosocial behavior. By examining aspects of these constructs simultaneously (i.e., mother personality, positive maternal parenting behaviors, children's regulation, and children's sympathy/prosocial behavior), it is hoped that some light will be shed on the nature of the relation between mother personality and children's sympathy/prosocial behavior.

### **Prosocial Behavior and Sympathy**

Prosocial behavior is voluntary behavior intended to benefit another (Eisenberg, Fabes, et al., 2006). These behaviors can include helping, caring, sharing, and protecting. Children who are prosocial tend to have positive relationships with their parents, teachers, and peers and tend to be low in behavior problems (e.g., Diener & Kim, 2004; Wentzel & McNamara, 1999). Most researchers are especially interested in *altruistic* prosocial behavior, which is prosocial behavior that is not motivated by external factors. This kind of altruistic behavior is seen as more other-oriented than other types of prosocial behavior (such as those behaviors motivated by relieving one's own distress in response to another's distress) and is considered to be an important component of moral development. Emotions can be an important part of prosocial behavior, particularly those that are considered *empathy-related* emotions.

Sympathy is an affective response that is often a product of empathy (i.e., an emotional response that is the result of apprehension or comprehension of another person's emotional state or condition, which is the same or very similar to what the other

person is feeling or would be expected to feel; Eisenberg, Fabes, et al., 2006), but it can derive directly from perspective taking or other cognitive processes such as retrieval of information from memory (e.g., retrieval of information from memory about people in need; Eisenberg, Fabes, et al., 2006). Sympathy consists of feeling sorrow or concern for the needy or distressed person, as opposed to merely experiencing the same or similar emotion that the other person is experiencing or is expected to experience (i.e., empathy; Eisenberg, Fabes, et al., 2006). It is the concern involved in sympathy that distinguishes it from empathy; just because a person experiences the same or similar emotion as another person (i.e., empathy) does not mean that he or she will be motivated to help that person. Feeling concern for another's situation or distress (i.e., sympathy) is likely to be associated with a desire to reduce that distress (Batson, 1991) and researchers have generally found evidence to support the positive relation between sympathy and prosocial behavior (e.g., Eisenberg, Fabes, Murphy, et al., 1996; Eisenberg, McCreath, & Ahn, 1988; Zahn-Waxler, Robinson, & Emde, 1992; see also Eisenberg, Fabes, et al., 2006, for a comprehensive review of the literature on this relation). Prosocial behaviors that stem from sympathy are the result of altruistic, other-focused concern. Prosocial behaviors originating from empathy-related responding are, therefore, morally motivated by sympathy.

### **Relations between Parenting and Prosocial Behavior/Sympathy**

The quality of care that a person receives from his or her parents has been documented as a primary environmental influence on children's development of empathic

tendencies (e.g., Eisenberg, Fabes, et al., 2006; Eisenberg, Fabes, Schaller, Carlo, & Miller, 1991; Zahn-Waxler & Radke-Yarrow, 1990). Parents' warmth and their use of reasoning and induction (as well as parenting that is a combination of warmth, sensitivity, and structure) are related to children's and adolescents' sympathy and prosocial behavior (Baumrind, 1991a; Clark & Ladd, 2000; Knafo & Plomin, 2006; Krevans & Gibbs, 1996; McGrath, Zook, & Weber-Roehl, 2003).

When investigating the role that parents play in their children's developmental outcomes, researchers often examine dimensions of parenting behavior (such as warmth and structure/control), rather than focusing on separate, individual parenting behaviors (Gadeyne, Ghesquière, & Onghena, 2004). The two main dimensions of positive parenting involve the affective response of parents toward their children (e.g., warmth, sensitivity) and the positive practices parents use when they endeavor to influence their children's behaviors (e.g., structure; Grolnick & Pomerantz, 2009; Maccoby & Martin, 1983). The positive parenting behaviors that the current study focused on were maternal warmth, sensitivity (which also includes aspects of responsiveness), and structure (sometimes labeled *behavioral control*; versus chaos – parenting behaviors that are noncontingent, inconsistent, and unpredictable; Prinzie, Stams, Deković, Reijntjes, & Belsky, 2009). These positive parenting behaviors have been theoretically (and sometimes empirically) linked to children's sympathy and prosocial behavior (e.g., Barber, Stolz, & Olsen, 2005; Baumrind, 1991a; Carlo, Mestre, Samper, Tur, & Armenta, 2010; Eisenberg, Spinrad, & Sadovsky, 2006; Maccoby & Martin, 1983; Newton, Laible, Carlo, Steele, & McGinley, 2014); the following sections provide a detailed look at the components of the three parenting dimensions of interest (i.e., warmth, sensitivity, and

structure) and examine how each dimension is related to sympathy and prosocial behavior.

### **Warmth**

Warmth represents the expression of positive affect, affection, and admiration toward the child (Davidov & Grusec, 2006). It involves displays of fondness and enjoyment of the child that are both spontaneous and contingent in response to children's behaviors and initiations (Davidov & Grusec, 2006; Maccoby & Martin, 1983; MacDonald, 1992; Roberts & Strayer, 1987). Displays of positive emotions are likely to be related to sensitive, non-intrusive parenting interactions, whereas displays of negative emotions may be related to more intrusive and less sensitive parenting behaviors (Smith et al., 2007). Warmth is essential for positive development in children, such as emotion regulation, low levels of aggression, and interpersonal closeness (Bugental & Grusec, 2006; Lansford et al., 2014). A lack of warmth may contribute to behavioral problems in children and adolescents (Rothbaum & Weisz, 1994; White & Renk, 2012). Parents who express higher levels of warmth tend to be more accepting of their children and to foster close relationships with their children (De Wolff & van IJzendoorn, 1997; Kerns, Brumariu, & Seibert, 2011; Putnick et al., 2012).

Warmth has been almost comprehensively recognized as a central influence in children's early socialization (see Eisenberg, Fabes, et al., 2006). Warm parenting affords children, particularly young children, the sense that they are loved and respected and enhances their motivation to comply and cooperate with their parents, in part through identification with them (Grusec, Goodnow, & Kuczynski, 2000). Social rewards, such as praise (which may be related to warmth) are likely to promote the internalization of

norms and principles that foster prosocial behavior (Eisenberg, Fabes, et al., 2006). Theoretically and empirically, parental warmth (as well as sensitivity/responsiveness) has been related to the expression and modeling of sympathy and prosocial behavior, which is then related to children's sympathy and prosocial behavior (Biringen & Easterbrooks, 2012; see also Eisenberg, Fabes, et al., 2006 and Eisenberg & Valiente, 2002). Many researchers have provided longitudinal and concurrent evidence that maternal warmth (both observed and reported) is positively related to children's sympathy and prosocial behavior (e.g., Clark & Ladd, 2000; Janssens & Deković, 1997). Similar findings have been reported with adolescents and young adults (Barnett, Howard, King, & Dino, 1980; Carlo et al., 2010; Laible & Carlo, 2004). However, the results from examinations of the relation between parental warmth and children's sympathy/prosocial behavior have often been mixed (e.g., Koestner, Franz, & Weinberger, 1990; Stewart & McBride-Chang, 2000). For example, Kienbaum, Volland, and Ulich (2001) found no relation between German mothers' warmth and their children's sympathetic and prosocial responses to distress. However, these researchers used a puppet vignette (i.e., children's reactions to the simulated distress of a puppet) as a measure of children's sympathy/prosocial behavior. Eisenberg and colleagues (see Eisenberg, Fabes, et al., 2006) have questioned the validity of this type of measure because it may not be evocative enough in terms of sympathy/prosocial behavior.

### **Sensitivity**

Sensitivity is sometimes labeled as responsiveness and refers to “the extent to which parents intentionally foster individuality, self-regulation and self-assertion by

being attuned, supportive, and acquiescent to the children's special needs and demands" (Baumrind, 1991a, p. 62). Sensitivity refers to contingent and consistent responsiveness toward children's cues (Lohaus, Keller, Ball, Elben, & Voelker, 2001). Sensitivity denotes parents' ability to read and respond to children's communications and needs in an appropriate way (Ainsworth, Blehar, Waters, & Wall, 1978; Biringen, 2009). Sensitivity is a primary way in which caregiving quality is expressed (Zhou et al., 2002), and sensitivity relates to quality of attachment as well as other aspects of the parent-child relationship and child development (Braungart-Rieker, Garwood, Powers, & Wang, 2001; De Wolff & van IJzendoorn, 1997). Sensitivity and warmth are likely to accompany each other in parenting interactions, such that sensitivity represents responding consistently and contingently, which can be done in a warm way (e.g., such that the parent exhibits positive affection toward the child; Lohaus et al., 2001; MacDonald, 1992). Parents who demonstrate contingent sensitivity, along with warmth, are likely to have children who are well-regulated and display positive behavioral outcomes (Barber, 1996; Bugental & Grusec, 2006; Spinrad et al., 2007). Indeed, parenting interactions high in sensitivity (and low in intrusiveness) have been linked to a host of positive outcomes in children, such as secure attachment, prosocial behavior, fewer aggressive and delinquent behavior problems, lower levels of social withdrawal, psychological distress, and somatic symptoms, as well as more positive peer interactions (Ainsworth et al., 1978; De Wolff & van IJzendoorn, 1997; Janssens & Deković, 1997; McElwain & Booth-LaForce, 2006; Mize & Pettit, 1997; Newton et al., 2014; Pettit, Bates, & Dodge, 1997; Puura et al., 2013; Smith, Calkins, Keane, Anastopoulos, & Shelton, 2004; Stams, Juffer, & van IJzendoorn, 2002; Stright, Gallagher, & Kelley,

2008). Parents who are sensitive (i.e., responsive) make it easy for their children to trust them to support them and provide for their needs, as well as to make reasonable demands for compliance to certain standards of behavior (which are all part of a secure mother-child attachment; Bretherton, Golby, & Cho, 1997; Spangler, 2013).

The use of responsive rather than harsh parenting has been found to be positively related to toddlers' sympathy and cooperation, as well as to children's prosocial behavior (Bryant & Crockenberg, 1980; Kiang, Moreno, & Robinson, 2004; Whiteside-Mansell, Bradley, Owen, Randolph, & Cauce, 2003). For example, mothers' sensitivity to their 12- and 15-month-old children's distress and emotional needs was related to children's prosocial behavior in response to their mothers' distress at 21 and 24 months (Kiang et al., 2004). In addition, parents who are sensitive and responsive are able to help their children effectively regulate negative emotions that are associated with distress (Bugental & Grusec, 2006). Children who are able to regulate their distress are more likely to respond with sympathy and prosocial behavior to others' distress (see Eisenberg, Fabes, et al., 2006).

### **Behavioral Control/Structure**

Behavioral control has historically been referred to as *demandingness* (e.g., Baumrind, 1991a; Maccoby & Martin, 1983). However, recently Grolnick and Pomerantz (2009) have suggested the need to delineate positive control (such as behavioral control) from negative control (e.g., psychological control, power assertion); therefore, from here forward the term *structure* will be used. Grolnick and colleagues (Grolnick & Pomerantz, 2009; Grolnick, 2003; Grolnick, Deci, & Ryan, 1997) have suggested that parental control only be conceptualized as parenting that is intrusive, dominating, and not child-

focused and that the term *structure* may be a better way to describe parenting that facilitates children's competence by giving children clear and consistent guidelines, expectations, and rules. Additionally, structure also refers to parenting that provides children with consistent consequences and feedback about their behavior, which may facilitate children's internalization of values (Grolnick & Pomerantz, 2009). Structure can also be represented by the level of strictness and the behavioral standards that parents express for their children (Carlo, McGinley, Hayes, Batenhorst, & Wilkinson, 2007). Structure also involves sensitivity; that is, sensitivity to the child's maturity level and matching expectations and limit setting so that it is appropriately demanding of maturity from the child. It has also been suggested that children are more likely to comply with parents' maturity demands, expectations, and rules (i.e., structure) if they are accompanied by parental warmth (see Grusec et al., 2000 and MacDonald, 1992).

Grolnick and colleagues (see Grolnick & Pomerantz, 2009) have suggested that parental use of structure with their children includes focusing on the outcomes of children's actions and providing children with consequences and feedback for their behavior (often called inductions, reasoning, or inductive reasoning; Eisenberg, Fabes, et al., 2006; Hastings, Utendale, & Sullivan, 2007; Hoffman, 1970). Parents' use of reasoning, as opposed to power assertive discipline, has been found to be related to children's and adolescents' sympathy and prosocial behavior (Krevans & Gibbs, 1996; Whiteside-Mansell et al., 2003). Negative disciplinary practices such as power assertion or punitive discipline may reduce prosocial behavior because these practices induce compliance to imposed rules rather than internalization of moral standards, and because the fear associated with punishment may interfere with learning (Hoffman, 1970; Staub,

1979). It has been suggested that disciplinary practices that involve reasoning increase children's awareness of the consequences of their behavior and are likely to promote adaptive behavior (such as prosocial behavior; Hoffman, 1970). When positive disciplinary practices such as reasoning are used (e.g., when parents tell children what the consequences of their behavior are), children pay more attention to parental messages, sympathize with people in need, and actively process parental messages (Hoffman, 1970). Also, parents who are higher in structure (e.g., set high standards of conduct for their children's behavior) may foster stronger internalized moral values and prosocial behavior in their children (Eisenberg, Fabes, et al., 2006; Grusec & Goodnow, 1994).

### **Mediation by Effortful Control**

Although researches have examined the direct relations between parenting practices and children's sympathy and prosocial tendencies, investigators are beginning to document the mediating role of children's dispositional factors in these relations. Researchers have established that emotion regulation is important for the development of children's socioemotional and social competence skills (e.g., Denham et al., 2003; Eisenberg, Eggum, Sallquist, & Edwards, 2010; Rubin, Coplan, Fox, & Calkins, 1995; Spinrad et al., 2007), but the best way to define this construct has been debated (e.g., Cole, Martin, & Dennis, 2004; Eisenberg & Spinrad, 2004). Emotion regulation is a broad construct that is likely to involve an individual's voluntary, effortful management of the experience of emotions, as well as the behavioral expression of these emotions (see Eisenberg & Spinrad, 2004). Effortful control (EC) is a construct that has been viewed as a central component of effortful emotion regulation (Rothbart & Bates, 2006). That is, EC is a set of skills that contribute to the regulation of emotions and refers to the capacity

of executive functioning to effortfully regulate one's behavior and emotions, and it involves the abilities to focus and shift attention, to plan, to detect errors, and to inhibit or activate behavior when necessary and appropriate (Rothbart & Bates, 2006).

Some aspects of parenting may contribute to children's sympathy/prosocial behavior via their impact on children's regulation (i.e., EC). Researchers have examined whether EC mediates the relation between different aspects of parenting (both positive and negative) and children's developmental outcomes, with mixed results. Spinrad et al. (2007) examined whether EC mediated the relation between positive parenting (i.e., warmth, sensitivity, and support) and children's social competence (e.g., compliance, empathy, prosocial behavior) in a sample of children studied longitudinally from 18 to 30 months old. These researchers found evidence for mediation by EC concurrently (within both times), as well as longitudinally when they did not control for the stability in the constructs over time. However, when autoregressive paths were included in the longitudinal model (to control for stability over time) EC no longer predicted social competence, although positive parenting did predict EC and social competence. Eisenberg, Spinrad, et al. (2010) used the same sample as Spinrad et al. (2007) in order to look at EC as a longitudinal mediator over a longer period of time. In this study, EC at 30 months did not mediate the relation between unsupportive parenting at 18 months and children's internalizing and externalizing behavior problems at 42 months. Unsupportive parenting did negatively predict children's EC, but even though EC was correlated with the outcomes both within and across time, EC failed to predict the outcomes once stability over time was taken into account. Interestingly, Taylor, Eisenberg, Spinrad, and Widaman (2013) did find mediation by EC, using the same sample as Eisenberg, Spinrad,

et al. (2010) across the same period of time, and they were able to do so while controlling for the stability in constructs across time.

It is important to note that Taylor et al. (2013) focused on the relation between intrusive parenting and children's ego resiliency (i.e., adapting to stress and/or change in one's environment). Therefore, it does not seem that the toddler and preschool period is too early to detect mediation (as Spinrad et al., 2007 suggested), but that perhaps EC is not an explanatory factor in the relation between positive parenting and positive outcomes (or negative parenting and negative outcomes), but that EC does explain the relation between negative aspects of parenting (e.g., intrusiveness, power assertion) and children's positive outcomes (or the relation between positive parenting and negative outcomes; see Eisenberg, Zhou, et al., 2005 and Valiente et al., 2006 for findings with older children). However, this possibility is contradicted by evidence from Eisenberg et al.'s (2003) study, in which they showed mediation by EC in the relation between positive parenting (positive expressivity and warmth) and children's social competence (i.e., socially appropriate behavior and popularity); this result was found only in regression analysis and not in structural equation models. Additionally, Valiente et al. (2006) found that EC did not mediate the relation between mothers' positive expressivity and children's internalizing behavior, whereas the mediated effect of EC was significant in the relation between expressivity and externalizing behavior. However, the children in these two studies were older than the sample of children in the aforementioned studies examining the mediating role of EC; therefore, it is possible that across time, and particularly at older ages, the mediated effect of EC on the relation between parenting behaviors and children's outcomes becomes more complex.

Although it has been theorized that EC mediates the relation between parenting and children's outcomes (Eisenberg, Cumberland, & Spinrad, 1998), empirical work has shown that the role of EC in this relation is still unclear (see also Eisenberg et al., 2001 and Kochanska & Knaack, 2003). However, it is likely that parents who are warm and sensitive/responsive are able to aid their children in the effective regulation of emotions that may be coupled with their own or another's distress (Bugental & Grusec, 2006). As such, children who are able to regulate their emotions are then more likely to respond to another's distress with sympathy (versus personal distress) and prosocial behavior because they are able to focus their attention on the person who is in need or distress (versus focusing on their own emotional arousal; Eisenberg, Fabes, et al., 2006; Eisenberg et al., 2007; Eisenberg, Spinrad, et al., 2006; Valiente et al., 2004).

### **Personality**

One definition of personality is “dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions” (McCrae & Costa, 1990, p. 23). The greatest support of personality and how to conceptualize it has come from the Five Factor Model (FFM) of personality (DeYoung, Quilty, & Peterson, 2007; Goldberg, 1993; John & Srivastava, 1999; McCrae & Costa, 1999). There have been two approaches to coming up with a model of personality – first is the lexical approach. If a trait is important, and easily observable, it seems likely that over time people would notice and give the trait a name. It was in the analysis of such traits that the FFM was first identified (John, Angleitner, & Ostendorf, 1988). The second approach was to analyze scales and inventories created by personality psychologists in order to identify common factors (e.g., Costa & McCrae, 1980). Neuroticism, Extraversion, and

Openness emerged as 3 recurrent factors. Questionnaire measures of Agreeableness and Conscientiousness were then developed. It has been argued that the FFM is fully equipped and adequate to account for both normal and abnormal dimensions of personality (Costa & McCrae, 1992).

There is ample evidence that the individual personality dimensions of the FFM do indeed refer to observable differences in patterns of thoughts, feelings, and actions. Support for this model is derived from factor analytic techniques designed to discriminate questionnaire measures of a range of individual differences. For instance, Goldberg (1990) executed three studies in order to look at the generality of the FFM. He analyzed multiple English trait terms of personality-descriptive adjectives (Study 1 had nearly 1500 such terms) in order to extract factors and confirm the viability of a FFM of personality. Goldberg (1990) looked at multiple factor analytic techniques and found that no factor beyond the five common factors was of any considerable size. He concluded that virtually all such English personality trait adjectives could be represented by the FFM. Additionally, the five broad factors are defined by facets/traits that mark important individual differences. Costa, McCrae, and Dye (1991) reviewed the literature on personality and came up with six facets for each personality dimension. However, as the examination of personality dimensions and their corresponding facets continues, researchers have found that the number of facets for certain personality dimensions may differ from what previous researchers have found (see MacCann, Duckworth, & Roberts, 2009 and Kern et al., 2013 for examples). The underlying structure of personality is thought to be universal; indeed, the FFM has been replicated across cultures, samples, and informants (Costa & McCrae, 1992; John & Srivastava, 1999).

The five factors (i.e., dimensions) of personality ('The Big 5') are labeled as follows (Caspi & Shiner, 2006; Goldberg, 1990; Prinzie et al., 2009):

- Openness to Experience (or intellect, culture)
- Extraversion (or surgency, positive affectivity)
- Neuroticism (or negative affectivity vs. emotional stability)
- Agreeableness (vs. antagonism)
- Conscientiousness (or constraint)

The current study focused on the personality dimensions of Agreeableness and Conscientiousness. As will be discussed, these two personality dimensions seem likely candidates to have the strongest relations with constructs that are hypothesized to predict sympathy/prosocial behavior in the current study (i.e., parenting and children's regulation).

### **Agreeableness**

Agreeableness has been conceptualized as individual differences in the coordination (vs. opposition) of joint interests (van Lieshout, 2000), which leads to more harmonious relationships. Agreeableness reflects an interpersonal orientation (sometimes called a prosocial or communal orientation; John & Srivastava, 1999) along a continuum from antagonism to empathy/compassion, the high end of which is characterized by cooperativeness, trust, and warmth (which is similar to the facet of warmth in Extraversion; Bornstein, Hahn, & Haynes, 2011; Costa et al., 1991; Prinzie et al, 2009) and has been considered primarily a dimension of interpersonal behavior (Costa et al., 1991). Agreeable individuals are more likely to give in during conflict situations by abstaining from efforts to control other people's behavior or by abstaining from rebelling

against rules and regulations; they are also more likely to be compassionate, soft-hearted, caring, helpful, good-natured, compliant, cooperative, forgiving, kind, generous, polite, flexible, sociable, considerate, and trusting (Costa & McCrae, 1992; Denissen, van Aken, & Dubas, 2009; Goldberg, 1992; Huver, Otten, de Vries, & Engels, 2010; Smith et al., 2007). Jensen-Campbell and colleagues have found that Agreeableness is related to conflict resolution tactics and behaviors that are likely to facilitate the maintenance of positive relationships across many different developmental periods (Graziano, Jensen-Campbell, & Hair, 1996; Jensen-Campbell, Gleason, Adams, & Malcolm, 2003; Jensen-Campbell & Graziano, 2001).

Facets of Agreeableness (based on the NEO-PI-R; Costa & McCrae, 1995; Costa et al, 1991) are as follows:

- Trust – the tendency to attribute benevolent intent vs. distrust, or suspicion that others are dishonest or dangerous; low level of trust is associated with cynicism
- Straightforwardness – directness and frankness when dealing with others
- Altruism – selflessness and a concern for others
- Compliance – an interpersonal style seen when conflict arises
- Modesty – defined by the tendency to *not* be assertive, argumentative, aggressive, self-confident, or idealistic
- Tender-mindedness – the tendency to be guided by feelings, particularly sympathy, in making judgments and forming attitudes

### **Conscientiousness**

The personality dimension of Conscientiousness has been conceptualized as individual differences in self-control, particularly as it applies to tasks and goals (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009; van Lieshout, 2000). Conscientiousness reflects the degree to which a person is well-organized, thorough, goal-oriented, and possesses a strong sense of purpose with high standards (Prinzle et al., 2009).

Conscientiousness also reflects the degree to which a person has ego strength, will power, initiative, and responsibility (Costa et al., 1991). There are both proactive and inhibitive aspects of Conscientiousness. The proactive element is a need for achievement and commitment to work; the inhibitive element is moral scrupulousness and cautiousness. Individuals high in Conscientiousness tend to be organized, active, surgent, orderly, emotionally hardy, responsible, decisive, hardworking, ambitious, goal-directed, dutiful, scrupulous, perseverant, punctual, reliable, logical, precise, foresighted, thoughtful, dependable, capable, resourceful, planful, have constraint and control (including delay of gratification), and follow socially prescribed rules and norms (Bornstein et al., 2011; Costa et al., 1991; Costa & McCrae, 1992; Denissen et al., 2009; Huver et al., 2010; John & Srivastava, 1999; Roberts et al., 2009; Smith et al., 2007).

Facets of Conscientiousness (based on the NEO-PI-R; Costa & McCrae, 1995; Costa et al, 1991) are as follows:

- Competence – the sense that one is capable, sensible, and accomplished
- Orderliness – the tendency to keep one’s environment tidy and well organized
- Dutifulness – a strict adherence to standards of conduct
- Achievement striving – striving for excellence

- Self-discipline – persistence; the ability to continue with a task despite boredom or other distractions; more proactive perseverance in tasks that are not immediately appealing; low self-discipline is seen in procrastination, and quickly giving up when faced with frustration; often called self-control or impulse control
- Deliberation – caution, planning, and thoughtfulness

### **Relations between Personality and Parenting**

It is important to establish how mothers' personality dimensions are related to their parenting behaviors in order to piece together how personality may be related to children's sympathy/prosocial behavior. Evidence is scant, if not nonexistent, on the direct relation between parental personality and children's sympathy and prosocial behavior. However, there are likely to be indirect links between parent personality and children's outcomes (i.e., personality dimensions are related to parenting behaviors and these parenting behaviors are then related in various ways, both directly and indirectly, to children's sympathy/prosocial behavior).

Parent personality has been assigned a major role in contributing to individual differences in parenting behaviors by some theorists (e.g., Prinzie et al., 2009; Vondra, Sysko, & Belsky, 2005). Belsky (1984; Belsky & Jaffee, 2006) was one of the first theorists to address the link between parenting and personality. He asserted three principal social-contextual determinants of parenting, including the parent's personality and other personal psychological resources, the child's individual characteristics, and contextual stressors and supports. He also suggested that of the three, personality may be a central mechanism through which parenting behavior is determined because personality

affects parenting directly and it shapes other social-contextual factors and forces that influence parenting. Personality is stable over time, particularly after age 30; therefore, it is likely to be related consistently to parenting behaviors (Terracciano, Costa, & McCrae, 2006).

### **Agreeableness**

Agreeableness has been proposed to be related to a desire to sustain positive social relationships and to act in ways that promote those relationships (Graziano, Hair, & Finch, 1997; Jensen-Campbell & Graziano, 2001; Tobin, Graziano, Vanman, & Tassinary, 2000). As such, parents high in Agreeableness would be expected to engage in more warm and sensitive parenting behaviors because they seek to have harmonious interactions with their children, are better able to follow others' cues (an index of sensitivity), and strive to maintain positive social interactions with their children. Parents high in Agreeableness are less prone to frustration, distress, irritation, aggression, and anger (behaviors which often result in harsh discipline) and parents high in Agreeableness are likely to approach their children in a way that is less likely to initiate or escalate conflictual interactions (Gleason, Jensen-Campbell, & Richardson, 2004; Meier, Robinson, & Wilkowski, 2006). Parents who are high in Agreeableness are also less likely to attribute negative intentions to their children when they misbehave (Bugental & Shennum, 1984). Researchers have found Agreeableness to be positively related to sensitivity and warmth, responsiveness, support, and negatively related to power assertion (Belsky & Barends, 2002; Belsky, Crnic, & Woodworth, 1995; Clark, Kochanska, & Ready, 2000; Huver et al., 2010; Kochanska, Clark, & Goldman, 1997; Smith et al., 2007); indeed, in a 2009 meta-analysis using 30 studies, Prinzie et al. found

that parents who were higher in Agreeableness (and Conscientiousness, see below) were also higher in indices of warmth and structure (which they labeled *behavioral control*). Parents higher in Agreeableness (but not Conscientiousness) were also higher in autonomy support (defined as parenting behavior that includes reasoning about children's misbehavior and its effect on others, which is an element of structure; Prinzie et al., 2009). In addition, Agreeableness in parents has been found to be related to higher levels of positive affect and positive emotional expressions, both displayed and reported by parents (Belsky et al., 1995; Costa & McCrae, 1980; Kochanska et al., 1997; Smith et al., 2007; Watson & Pennebaker, 1989). As mentioned previously, this positive affect displayed by parents is likely to be an index of warmth.

### **Conscientiousness**

People high in the personality dimension of Conscientiousness tend to be organized, purposeful, and have a sense of competence (Costa et al., 1991; Prinzie et al., 2009). As such, it has been proposed that parents who are high in this dimension would provide a more orderly and consistent parenting environment for their children (Prinzie et al., 2009; Smith et al., 2007). It seems likely that this kind of parenting environment would include sensitive interactions with children (i.e., being contingently and consistently responsive to children). Additionally, researchers have suggested that maternal competence is related to positive parenting practices such as sensitivity and consistency (Asscher, Hermanns, & Deković, 2008; de Haan, Prinzie, & Deković, 2009; Locke & Prinz, 2002). It seems plausible that one's general sense of competence (a characteristic of Conscientiousness) extrapolates to one's sense of competence as a parent; therefore, parents high in Conscientiousness may feel more competent in their

role as a parent and be more likely to provide children with sensitivity and structure. Some empirical evidence has reinforced these ideas; parents high in Conscientiousness have been found to be supportive, responsive, nurturing, sensitive, and observant, and they are likely to set limits without being power assertive or negatively controlling (Clark et al., 2000; Clark & Ladd, 2000; Kochanska, Friesenborg, Lange, & Martel, 2004; Losoya, Callor, Rowe, & Goldsmith, 1997; Prinzie et al., 2009; Smith et al., 2007). In addition, Conscientiousness has also been found to be positively related to parental support in a sample of adolescents, although this relation became nonsignificant when controlling for other study variables (Huver et al., 2010). Like Agreeableness, Conscientiousness has also been found to be related to parental positive affect (perhaps an indicator of warmth), which may then contribute to more sensitivity toward offspring (Smith et al., 2007).

## Hypotheses

The aim of the present study was to examine the relations among mothers' personality characteristics (namely, Agreeableness and Conscientiousness), maternal parenting behaviors, and children's regulation and sympathy/prosocial behavior using a multi-method, longitudinal design. Secondary aims of the present study were to examine the stability of each construct (i.e., personality, parenting, regulation, and sympathy/prosocial behavior) over time and to test the mediated effects of both parenting behaviors and children's regulation (see Figure 2).

There were several hypotheses for the current study. It was hypothesized that Agreeableness would be positively related to warmth and sensitivity, based on literature that suggests that Agreeableness is related to a desire to promote and sustain positive relationships and harmonious social interactions. Agreeableness was also hypothesized to be positively related to structure, as was demonstrated by Prinzie et al. (2009).

Individuals high in Conscientiousness are purposeful and possess a sense of competence, which could translate into sensitivity and structure in parenting interactions; therefore Conscientiousness was hypothesized to be positively related to sensitivity and structure. Conscientiousness may also be positively related to warmth/positive affect, as was found in Prinzie et al.'s (2009) meta-analysis.

Warmth was expected to relate positively to sympathy/prosocial behavior. Warmth and sympathy were expected to be positively related due to the affective nature of both, and also because warmth is likely to promote children's regulation, which is then likely to positively affect children's sympathy and prosocial behavior (Bugental & Grusec, 2006; Eisenberg et al., 2007). Warmth may also facilitate internalization of

parental values (via social rewards), which is likely to contribute to prosocial behavior (Eisenberg, Fabes, et al., 2006).

Sensitivity was also expected to relate positively to sympathy/prosocial behavior by affecting children's regulation. By helping children to regulate their distress-related emotions (perhaps by reacting with contingent and appropriate responses), parents are encouraging the development of both sympathy and prosocial behavior (Bugental & Grusec, 2006; Eisenberg, Fabes, et al., 2006).

Structure was expected to relate positively to sympathy/prosocial behavior. Parents who use appropriate structure tend to give children consequences of and feedback about their behavior, which can aid in the internalization of values (which is then related to the development of sympathy/prosocial behavior).

## Method

Data were collected from a normative sample of children and their mothers, fathers, and non-parental caregivers. Data were examined at four time points, Time 1 (T1) when the children were 18 months of age, Time 2 (T2) at 30 months, Time 3 (T3) at 42 months, and Time 4 (T4) at 54 months.

Children at these ages were included in this study because during the second year of life children are learning the norms for behavior within their family, and the process of socialization during this time creates a unique set of challenges for parents (see Edwards & Liu, 2002). Additionally, children's regulation, although it emerges at a young age, is improving greatly from age three to four (Rothbart & Bates, 2006). Lastly, sympathy and prosocial behaviors are usually starting to emerge by 18 months (and occasionally earlier, see Roth-Hanania, Davidov, & Zahn-Waxler, 2011) and are increasing throughout the period examined (Eisenberg, Fabes, et al., 2006; Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008). In addition, it was important to include multiple time points in order to examine change and stability in constructs over time.

### Participants

**T1 sample characteristics.** At T1, 256 children participated either in the laboratory assessment and/or by questionnaire assessments completed by the mothers (nine families participated by mail-in questionnaires only). In addition, 176 non-parental caregivers and 201 fathers provided questionnaires, usually by mail. At T1, the sample included 141 boys and 115 girls ( $M$  age = 17.79 months,  $SD$  = .52). At the T1 laboratory assessment, 80.5% of children were Caucasian, 5.1% were African American, 2.3% were Asian, 4.3% were Native American, 2.3% were rated as another race, and 5.5% were

unknown. As for ethnicity, 77% of the children were not Hispanic/Latino and 23% were Hispanic/Latino. 92.1% of children lived in a two-parent household, whereas 7.9% lived in a single-parent household. Parents' education ranged from the completion of grade school to the completion of a Ph.D., J.D., or M.D., but on average parents had completed some college or received a 2-year degree (34.6% of mothers and 36.9% of fathers). Annual family income ranged from less than \$15,000 to more than \$100,000, but the average family income was \$45,000 - \$65,000.

**T2 sample characteristics.** At T2, 230 children participated either in the laboratory assessment and/or by questionnaire assessments completed by the mothers (14 families participated by mail-in questionnaires only). In addition, 153 non-parental caregivers and 161 fathers provided questionnaires, usually by mail. The T2 sample included 128 boys and 102 girls ( $M$  age = 29.77 months,  $SD$  = .65). At the T2 laboratory assessment, 80.4% of children were Caucasian, 5.7% were African American, 3.0% were Asian, 3.9% were Native American, 2.1% were rated as another race, and 4.8% were unknown. As for ethnicity, 77.4% of the children were not Hispanic/Latino and 22.6% were Hispanic/Latino. 89.7% of children lived in a two-parent household, whereas 10.3% lived in a single-parent household. Parents' education ranged from the completion of grade school to the completion of a Ph.D., J.D., or M.D., but on average parents had completed some college or received a 2-year degree (39.7% of fathers) or were 4-year college graduates (37.8% of mothers). Annual family income ranged from less than \$15,000 to more than \$100,000, but the average family income was \$45,000 - \$65,000.

**T3 sample characteristics.** At T3, 210 children participated either in the laboratory assessment and/or by questionnaire assessments completed by the mothers (18

families participated by mail-in questionnaires only). In addition, 151 non-parental caregivers and 136 fathers provided questionnaires, usually by mail. The T3 sample included 116 boys and 93 girls ( $M$  age = 41.75 months,  $SD$  = .65). At the T3 laboratory assessment, 82.3% of children were Caucasian, 3.3% were African American, 1.0% were Asian, 2.9% were Native American, 6.7% were rated as another race, and 3.8% were unknown. As for ethnicity, 84.2% of the children were not Hispanic/Latino and 11.4% were Hispanic/Latino (ethnicity data were missing for 4.3% of the children). 86.3% of children lived in a two-parent household, whereas 13.7% lived in a single-parent household. Parents' education ranged from the completion of grade school to the completion of a Ph.D., J.D., or M.D., but on average parents had completed some college or received a 2-year degree (35.8% of fathers) or were 4-year college graduates (36.8% of mothers). Annual family income ranged from less than \$15,000 to more than \$100,000, but the average family income was \$45,000 - \$65,000.

**T4 sample characteristics.** At T4, 191 children participated either in the laboratory assessment and/or by questionnaire assessments completed by the mothers (23 families participated by mail-in questionnaires only). In addition 145 non-parental caregivers and 119 fathers provided questionnaires, usually by mail. The T4 sample included 107 boys and 84 girls ( $M$  age = 53.88 months,  $SD$  = .82). At the T4 laboratory assessment, 81.7% of children were Caucasian, 6.3% were African American, 1.6% were Asian, 4.7% were Native American, 1.0% were rated as another race, and 2.6% were biracial (i.e., two minority races). As for ethnicity, 81.7% of the children were not Hispanic/Latino and 18.3% were Hispanic/Latino. 84.1% of children lived in a two-parent household, whereas 15.9% lived in a single-parent household. Information on

parents' education attainment was not collected at this time point. Annual family income ranged from less than \$15,000 to more than \$100,000, but the average family income was \$45,000 - \$65,000.

**Attrition analyses.** Attrition analyses were conducted to determine if there were differences between individuals who participated at all four time points ( $n = 184$ ) and those who did not participate at all four time points ( $n = 72$ ). *T*-tests (for continuous variables) or  $\chi^2$  tests (for categorical variables) were computed for demographic variables and all T1 or T2 study variables (described in the Measures section; EC, observed sympathy/prosocial behavior, and reported prosocial behavior were examined at T2 because these constructs were not measured at T1). Families who attrited were more likely to have mothers and fathers who were younger ( $M_s = 27.69$  and  $29.86$ ,  $SD_s = 5.62$  and  $5.92$ , respectively) than families who participated at all four time points ( $M_s = 29.73$  and  $31.63$ ,  $SD_s = 5.53$  and  $5.62$ , respectively),  $t_s(252$  and  $245) = 2.63$  and  $2.20$ ,  $p_s = .01$  and  $.03$ , for mothers and fathers respectively. Families who attrited were more likely to have mothers who were lower in structure during the Free Play clean-up ( $M = .71$ ,  $SD = .33$ ) than families who participated at all four time points ( $M = .82$ ,  $SD = .28$ ). Families who attrited were more likely to have mothers who were lower on sensitivity during the Free Play task ( $M = 2.38$ ,  $SD = .62$ ) than families who participated at all four time points ( $M = 2.57$ ,  $SD = .59$ ),  $t(243) = 2.17$ ,  $p = .03$ . Families who attrited were more likely to have children who were higher in caregiver-reported prosocial behavior ( $M = 1.28$ ,  $SD = .60$ ) than families who participated at all four time points ( $M = .98$ ,  $SD = .63$ ),  $t(166) = -2.67$ ,  $p = .01$ . No other demographic or study variables showed a difference between participants who attrited and those who did not.

## **Procedure**

The mothers and children that were included in this study were recruited from three hospitals in a metropolitan area at the time of the children's birth by distributing informational forms to mothers in the postpartum ward. All of the children who were recruited were born full term (> 37 weeks), healthy, and without complications. Parents were asked to come into the laboratory with their child for the observational assessments when their child was approximately 18, 30, 42, and 54 months old. Prior to each assessment, mothers were sent a packet of questionnaires by mail to complete and to bring to the laboratory visit (fathers were sent a shorter packet that did not include temperament assessments). The mothers were asked for their voluntary consent to participate in the study and after the consent form was signed, the child and mother were brought into a university laboratory assessment room. The mothers filled out a packet of questionnaires, which included measures of their personality, as well as their children's effortful control and prosocial behavior. While the mothers were filling out the questionnaires, the children participated in tasks that assessed their regulation, sympathy, and prosocial behavior as part of a larger study. Additionally, mothers and children participated in tasks that also assessed aspects of the mothers' parenting. Fathers and caregivers received questionnaires by mail. Families and caregivers received a modest payment for their participation and children received two small toys at the end of the laboratory session.

## **Measures**

See Appendix B for information on all reported measures (e.g., items and response scales). See Appendix C for information on all observed measures (e.g., coding

procedures and systems). Figures 3-7 show the measures of each construct as indicators of latent factors.

**Mother personality.** At T1, mothers completed the Big Five Personality Inventory (BFI; John, Donahue, & Kentle, 1991), which uses fewer items for each scale than other Big Five measures. Mothers reported on their own personality characteristics using a 5-point scale (1 = *disagree strongly* and 5 = *agree strongly*) with seven items from the Agreeableness and Conscientiousness subscales of the BFI.

**Agreeableness.** Mothers rated their Agreeableness with seven items from the BFI (e.g., “Do you feel that you are someone who is considerate and kind to almost everyone?”), Cronbach’s alpha ( $\alpha$ ) = .70.

**Conscientiousness.** Mothers rated their Conscientiousness with seven items from the BFI (e.g., “Do you feel that you are someone who is a reliable worker?”),  $\alpha$  = .68.

**Maternal warmth.** At T1, T2, and T3 mothers’ warmth was observed during two tasks: Free Play and a Teaching task using a puzzle (at T1 and T2) or using Lego® blocks (at T3). During the Free Play task mothers and children were given a basket of toys and mothers were instructed to use the toys to play with their child just like they would in their own home (Fish, Stifter, & Belsky, 1991); dyads were given three minutes to play with the toys. The task was coded for intensity of maternal positive affect (i.e., smiling and laughing; perhaps an indication of warmth) every 15 seconds on a 4-point scale (1 = *no positive emotion*, 2 = *low intensity* [i.e., slight or very brief smile, uses positive tone], 3 = *moderately positive* [i.e., clear smile or prolonged slight smiles, uses more prolonged positive tone], 4 = *intensely positive* [e.g., intense smile or laugh, or smiling for prolonged period]). Inter-rater reliabilities (i.e. Pearson *rs*[Intraclass correlations (ICCs)]);

based on 62, 45, and 58 observations at T1, T2, and T3, respectively) were .82[.82], .90[.90], and .90[.88] at T1, T2, and T3, respectively.

During the Teaching task, the experimenter placed a puzzle (at T1 and T2) in front of the child (with the pieces removed and also placed in front of the child). Mothers were instructed to teach their child how to put the puzzle together using strategies that they would use at home; dyads were given three minutes to put the puzzle together (at T3, children were given Lego® blocks and mothers were instructed to teach their child how to replicate a Lego® model from a picture given to the mother; adapted from Calkins & Johnson, 1998). The task was coded for maternal warmth (e.g., displays of closeness, friendliness, encouragement, and positive affect) every 30 seconds on a 5-point scale (1 = *no warmth* [e.g., ignores child, displays primarily negative affect], 2 = *minimal warmth* [e.g., does not initiate contact, little positive affect displayed], 3 = *moderate warmth* [e.g., responsive and initiates contact, some positive affect displayed], 4 = *moderate to high warmth* [e.g., engaged with child for much of the time, affectionate toward child], 5 = *very high warmth* [e.g., engaged with child for most of the time, displays positive affect toward child]). Inter-rater reliabilities (i.e., Pearson *rs*[ICCs]; based on 62, 54, and 48 observations at T1, T2, and T3, respectively) were .83[.83], .73[.66], and .89[.88] at T1, T2, and T3, respectively.

The Teaching task was also coded for intensity of maternal positive affect (i.e., smiling and laughing; perhaps an indication of warmth) every 10 seconds on a 4-point scale (1 = *no positive emotion*, 2 = *low intensity* [i.e., slight or very brief smile, or uses positive tone], 3 = *moderately positive* [i.e., clear smile or prolonged slight smiles, uses more prolonged positive tone], 4 = *intensely positive* [e.g., intense smile or laugh, or

smiling for prolonged period]). Inter-rater reliabilities (i.e. Pearson *rs*[ICCs]; based on 62, 54, and 48 observations at T1, T2, and T3, respectively) were .90[.89], .84[.73], and .89[.87] at T1, T2, and T3, respectively.

**Maternal sensitivity.** At T1, T2, and T3 mothers' sensitivity (e.g., providing appropriate stimulation, acknowledging and responding to child's affect, arousal, interests, and abilities) was coded during the Free Play task every 15 seconds on a 4-point scale (1 = *no sensitivity*, 2 = *low, minimal sensitivity* [i.e., one instance], 3 = *moderate sensitivity* [i.e., more than one instance or one prolonged or intense instance], 4 = *high sensitivity* [i.e., contingently responsive to child's interest and affect, good timing is evident]). Inter-rater reliabilities (i.e., Pearson *rs*[ICCs]; based on 62, 45, and 58 observations at T1, T2, and T3, respectively) were .81[.81], .86[.86], and .76[.68] at T1, T2, and T3, respectively.

At T1, T2, and T3, the Teaching task was also coded for maternal sensitivity (e.g., being aware of child's mood, interests, and capabilities and allowing those to guide the mother's interaction with the child) every 30 seconds on a 4-point scale (1 = *no sensitivity*, 2 = *low, minimal sensitivity* [i.e., one instance], 3 = *moderate sensitivity* [i.e., more than one instance or one prolonged or intense instance], 4 = *high sensitivity* [i.e., contingently responsive to child's interest and affect, good timing is evident]). Inter-rater reliabilities (i.e., Pearson *rs*[ICCs]; based on 62, 54, and 48 observations at T1, T2, and T3, respectively) were .82[.82], .81[.71], and .87[.83] at T1, T2, and T3, respectively.

**Maternal structure.**

**Reported.** Mothers reported on their use of structure (1 = *never* and 7 = *9 or more times per week*) at T1, T2, and T3 with one item (i.e., reasoning) from the Parental

Responses to Children's Misbehavior – Revised scale (Holden & Zambarano, 1992).

Because maternal structure is a constellation of parenting behaviors, including reasoning (Grolnick & Pomerantz, 2009), mother-reported reasoning was chosen as a component of maternal structure.

**Observed.** At T1, T2, and T3, mothers' structure (i.e., gentle verbal control) was observed during two tasks: immediately after the Free Play task (during the "clean-up" segment) and during the "prohibition" toys. During the clean-up, mothers were instructed to have their child clean up the toys they had been playing with just like they would do at home; the task lasted three minutes, or until all the toys were in the basket (Kochanska & Aksan, 1995). The task was coded for the absence or presence of structure (i.e., gentle verbal control - directing the child's behavior in a gentle, affectionate, or playful manner; includes using reasoning) every 15 seconds (0 = *absent/not observed* and 1 = *present/observed*), and then averaged together. Inter-rater reliabilities (i.e. Kappas; based on 68, 56, and 47 observations at T1, T2, and T3, respectively) were .60, .85, and .95 at T1, T2, and T3, respectively.

For the prohibition toys, the experimenter placed a shelf of attractive toys in the room prior to the Free Play task (Kochanska & Aksan, 1995). Mothers were instructed that the children should not be allowed to touch the toys and a "do not touch" sign was also affixed to the shelf to remind the mothers about the rule; the task lasted approximately 10 minutes. The task was coded for the absence or presence of structure (i.e., gentle verbal control - affectionately interacting with the child while subtly reminding them about the rule) every 15 seconds (0 = *absent/not observed* and 1 = *present/observed*), and then averaged together. After averaging, the measure of structure

was again dichotomized so that 0 = *no occurrence of structure* and 1 = *any occurrence of structure*. Inter-rater reliabilities (i.e., Kappas; based on 69, 56, and 45 observations at T1, T2, and T3, respectively) were .70, .71, and .77 at T1, T2, and T3, respectively.

**Children's effortful control – reported.** Children's effortful control (EC) was assessed with mothers' and caregivers' reports on the Early Childhood Behavior Questionnaire (ECBQ; Putnam, Gartstein, & Rothbart, 2006) at T2 and the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, & Hershey, 1994; Rothbart, Ahadi, Hershey, & Fisher, 2001) at T3 and T4. At each time point, mothers and caregivers rated items from the attentional focusing, attentional shifting, and inhibitory control subscales of the ECBQ or CBQ using a 7-point scale (1 = *never* and 7 = *always*).

**Attentional focusing.** Mothers and caregivers rated attentional focusing (12 items at T2 and 14 items at T3 and T4; e.g., "When picking up toys or doing other tasks, usually keeps at the task until it's done");  $\alpha$ s = .81, .77, and .77 for mothers at T2, T3, and T4, respectively;  $\alpha$ s = .85, .74, and .72 for caregivers at T2, T3, and T4, respectively.

**Attentional shifting.** Mothers and caregivers rated attentional shifting (12 items at all three time points; e.g., "Can easily shift from one activity to another");  $\alpha$ s = .73, .67, and .73 for mothers at T2, T3, and T4, respectively;  $\alpha$ s = .71, .80, and .82 for caregivers at T2, T3, and T4, respectively.

**Inhibitory control.** Mothers and caregivers rated inhibitory control (12 items at T2 and 13 items at T3 and T4; e.g., "can lower his/her voice when asked to do so");  $\alpha$ s = .88, .77, and .80 for mothers at T2, T3, and T4, respectively;  $\alpha$ s = .88, .82, and .83 for caregivers at T2, T3, and T4, respectively.

**Children's effortful control – observed.**

***Dinky toys.*** At T2, T3, and T4, children were asked by the experimenter to choose a toy from an open, clear box containing a variety of small toys. Children were told that they should verbally indicate which toy they wanted to choose and not to point to or touch the toys, but to keep their hands in their lap (Kochanska, Murray, & Harlan, 2000). Children completed this task twice and an overall restraint score was coded (1 = *no attempt at self-restraint, goes for the toy immediately each time* to 4 = *extreme attempt at self-restraint, pulls back each time*). Inter-rater reliabilities (i.e., Pearson *rs*[ICCs]; based on 65, 60, and 50 observations at T2, T3, and T4, respectively) were .75[.71], .92[.92], and .74[.72] at T2, T3, and T4, respectively.

***Rabbit and turtle.*** At T2, T3, and T4, the experimenter instructed children to maneuver a plastic figurine from the beginning to the end of a curvy path drawn on a mat (Kochanska et al., 2000). Children completed two baseline trials with a sex-matched child figurine and four experimental trials (two trials with a rabbit figurine and two trials with a turtle figurine). Children were instructed to move the rabbit figurine quickly (“fastest rabbit in the world”) and to move the turtle figurine slowly (“slowest turtle in the world”) while still following the path. For each experimental trial, children received a baseline score of 1 point, and points were added to the baseline score based on the maneuvering of each of the six curves in the path (0 = *ignores curve*, 1 = *figurine above the mat and within the lines of the path*, 2 = *figure on the mat and within the lines of the path*); if children successfully followed all six curves for a single trial, they would be given a trial curve score of 13 points (baseline score plus 2 points per curve). The four curve scores were averaged together to create an overall curve score. Inter-rater

reliabilities (i.e., Pearson  $r$ s[ICCs]; based on 60, 59, and 67 observations at T2, T3, and T4, respectively) were .97[.96], .96[.96], and .93[.93] at T2, T3, and T4, respectively.

***Waiting for gift bow.*** At T2, T3, and T4, children were seated at a table and the experimenter placed a gift box on the table in front of the child. The experimenter told the child that she forgot the gift bow, that she would be right back with the bow, and that the child should not touch or open the gift box while she was gone (Kochanska et al., 2000). The experimenter left the room for two minutes and then returned with the bow (at T2 the task was originally three minutes, but was capped at two minutes to be consistent across time). At T2, the gift box was placed inside of a gift bag, and inter-rater reliabilities (based on 65 observations at T2) were computed for children's latencies to (a) touch the bag ( $r$  and ICC = .98), (b) look inside the bag ( $r$  and ICC = .88), (c) put their hands in the bag ( $r$  and ICC = .98), (d) pull the box out of the bag ( $r$  and ICC = .93), (e) open the box ( $r$  and ICC = 1.0), and (f) leave their seat ( $r$  and ICC = 1.0). At T3 and T4, the gift box was placed directly on the table (without the gift bag), and inter-rater reliabilities (based on 62 and 49 observations at T3 and T4, respectively) were computed for children's latencies to: (a) touch the box ( $r$  and ICC = .99 at both time points), (b) open the box ( $r$  and ICC = .99 at T3 and .997 at T4), (c) take out the gift ( $r$  and ICC = 1.0 at both time points), and (d) leave their seat ( $r$  and ICC = .95 at both time points). At each time the latencies were averaged together because they were moderately to highly correlated  $r$ s(167-214) = .20 to .90,  $p$ s = .01 to <.001, except for the correlation between latency to touch the box and latency to leave the seat at T3 and T4,  $r$ s(190 and 167) = .12 and .09,  $p$ s = .11 and .24, as well as the correlation between latency to open the box and latency to leave the seat at T4,  $r$ (167) = .15,  $p$  = .06. At each time point, the average of all

the latencies was divided by 60 in order to compute the average of all the latencies in minutes.

**Sympathy.** Observed measures of sympathy and prosocial behavior were combined for the current study. However, for purposes of providing information about measures, sympathy and prosocial behavior (both observed and reported) are presented separately below. Figure 6 provides a cohesive look at the measures of observed sympathy and observed prosocial behavior combined as indicators of a single latent construct of observed sympathy/prosocial behavior at each of the three time points.

***Experimenter hurt (E Hurt).*** At T2 and T3, the experimenter entered the room, dropped a box of toys on her foot, and enacted pain and distress for one minute (during the one minute the experimenter said things like “ouch, my toe really hurts” every 15 seconds, and displayed body movements such as rocking back and forth and rubbing the injured foot; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). The procedure was similar at T4, but modified so that the experimenter pretended to snap her finger in a clipboard (and enacted pain and distress for one minute). The task was coded for hypothesis testing (i.e., the child’s attempts to label or understand the problem; perhaps an indication of sympathy or concern for the other) every 10 seconds on a 3-point scale (1 = *no hypothesis testing*, 2 = *mild hypothesis testing* [e.g., looking from the experimenter to her injured finger with either mild or no body movement], 3 = *sustained or a clear act of hypothesis testing* [e.g., bending over, approaching experimenter, 3 or more looks from the experimenter to her injured finger]). Inter-rater reliabilities (i.e., Pearson *rs*[ICCs]; based on 68, 75, and 49 observations at T2, T3, and T4, respectively) were .75[.70], .63[.63], and .81[.81] at T2, T3, and T4, respectively.

**Reported prosocial behavior.** Mothers and fathers assessed children's dispositional prosocial behavior at T2, T3, and T4 on a 3-point scale (0 = *not true*, 1 = *somewhat true or sometimes true*, 2 = *very true or often true*) with four items from the empathy subscale of the Infant-Toddler Social and Emotional Assessment (ITSEA; Carter & Briggs-Gowan, 1999). These four items were chosen from the empathy subscale as they were most likely to reflect prosocial behavior toward distressed/needful others, as well as sympathy ("Tries to make you feel better when you are upset," "Is aware of other people's feelings," "Tries to help when someone is hurt; for example, gives a toy," and "Is worried or upset when someone is hurt"). Cronbach's  $\alpha$ s for mothers and fathers, respectively = .75 and .78 at T2; .77 and .81 at T3; and .77 and .77 at T4.

**Observed prosocial behavior.**

***E Hurt.*** In order to assess children's prosocial behaviors, children's spontaneous behavioral efforts to intervene on behalf of the experimenter, to change the situation, or to alleviate the 'pain' of the experimenter were coded (i.e., the child kissing, hugging, or patting the experimenter, as well as the child offering the experimenter a toy or other object intended to soothe) during the E Hurt task. Additionally, children's prosocial verbalizations (e.g., "need bandaid?") were also coded, as they could be considered an alternative way to express prosocial behavior (and perhaps sympathy). Children's prosocial behaviors and prosocial verbalizations were coded every ten seconds on a 4-point scale (1 = *none*, 2 = *one or a vague indication*, 3 = *two times or a clear act*, 4 = *three times, or intense, prolonged, or sustained behavior or vocalizations*). Inter-rater reliabilities (i.e., Pearson  $r$ s [ICCs]; based on 68, 75, and 49 observations, at T2, T3, and T4, respectively) could not be computed (96% overlap), .76[.68], and 1.0[.95], for

prosocial behaviors at T2, T3, and T4, respectively, and .93[.93], .93[.62], and .95[.91],  
for prosocial verbalizations at T2, T3, and T4, respectively.

## Results

For each of the constructs (i.e., maternal warmth, maternal sensitivity, maternal structure, effortful control, observed sympathy/prosocial behavior, and reported prosocial behavior), the relations of the measures were examined both within and across time. Within-time relations among the measures of T1 maternal personality were also examined. In addition, Confirmatory Factor Analyses (CFAs) were conducted for each of the constructs (excluding maternal personality) in order to determine the factor structure of each construct across time. *Mplus* 6.1 (Muthén & Muthén, 1998-2010) was used for the CFAs. Described below, path analyses (including a model in which mediation was tested) were also conducted using *Mplus* 6.1. Means and standard deviations for all study variables are presented in Table 1.

### Relations of Maternal Warmth Within and Across Time

At T1, T2, and T3, the measures of maternal warmth were the observed maternal positive affect during the Free Play task and the observed maternal warmth and observed maternal positive affect during the Teaching task. At T1, all measures of maternal warmth were significantly correlated,  $r_s(245-246) = .32$  to  $.53$ ,  $p_s < .001$ . At T2 all measures were significantly correlated,  $r_s(216) = .36$  to  $.55$ ,  $p_s < .001$ . At T3, all measures were significantly correlated,  $r_s(192) = .17$  to  $.43$ ,  $p_s = .02$  to  $< .001$ .

Observed maternal positive affect during the Free Play task was significantly correlated across all three time points,  $r_s(187-212) = .22$  to  $.42$ ,  $p_s = .002$  to  $< .001$ . Observed maternal warmth during the Teaching task also was significantly correlated across all three time points,  $r_s(187-212) = .17$  to  $.50$ ,  $p_s = .02$  to  $< .001$ . Observed maternal positive affect during the Teaching task was significantly correlated across T1

and T2, and across T1 and T3,  $r_s(212 \text{ and } 187) = .30 \text{ and } .15, p_s = < .001 \text{ and } .04$ .

Observed maternal positive affect during the Teaching task was marginally correlated across T2 and T3,  $r(190) = .12, p = .09$ . Correlations among measures of maternal warmth within and across time can be seen in Table 2.

### **Relations of Maternal Sensitivity Within and Across Time**

At T1, T2, and T3, the measures of maternal sensitivity were the observed maternal sensitivity during the Free Play task and the observed maternal sensitivity during the Teaching task. The two measures were significantly correlated within each time point,  $r_s(192-245) = .18 \text{ to } .29, p_s = .004 \text{ to } < .001$ .

Measures of maternal sensitivity during the Free Play task were significantly correlated across all three time points,  $r_s(187-212) = .37 \text{ to } .42, p_s < .001$ . Measures of maternal sensitivity during the Teaching task were also significantly correlated across all three time points,  $r_s(187-212) = .25 \text{ to } .47, p_s < .001$ . The relations among these measures can be seen in Table 3.

### **Relations of Maternal Structure Within and Across Time**

At T1, T2, and T3, the measures of maternal structure were the reported structure (i.e., reasoning) from the PRCM and the observed structure (i.e., gentle verbal control) during both the Free Play (“clean-up” segment) and the “prohibition” toys tasks. At T1, the three measures were significantly correlated,  $r_s(227-241) = .17 \text{ to } .29, p_s = .01 \text{ to } < .001$ . At T2, the measure of observed maternal structure during the Free Play task was significantly correlated with both the observed measure of maternal structure during the “prohibition” toys task and the reported measure of maternal structure,  $r_s(206 \text{ and } 208) = .27 \text{ and } .15, p_s = < .001 \text{ and } .03$ , respectively. The measure of reported maternal structure

was marginally correlated with the observed measure of maternal structure during the “prohibition” toys task,  $r(201) = .13, p = .07$ . At T3, the only significant correlation was between the two observed measures of maternal structure (i.e., during the Free Play and “prohibition” toys tasks),  $r(181) = .29, p < .001$ ; the reported measure of maternal structure was not significantly correlated with either of the observed measures.

The reported measure of maternal structure was significantly correlated across all three time points,  $r_s(198-207) = .37$  to  $.66, p_s < .001$ . The observed measure of maternal structure during the Free Play task was also significantly correlated across all three time points,  $r_s(185-211) = .17$  to  $.48, p_s = .02$  to  $< .001$ . The observed measure of maternal structure during the “prohibition” toys task was significantly correlated across T1 and T2,  $r(199) = .30, p < .001$ . The measure was marginally correlated across T2 and T3, as well as across T1 and T3,  $r_s(173$  and  $176) = .13$  and  $.14, p_s = .08$  and  $.06$ . The relations among measures of maternal structure can be seen in Table 4.

### **Relations of Effortful Control Within and Across Time**

The T2, T3, and T4 measures of EC used in the current analyses were mother- and caregiver-reported attention shifting, attention focusing, and inhibitory control (12 items per subscale from the ECBQ at T2 and 14 items per subscale from the CBQ at T3 and T4), as well as the following observed measures: the mean curve score during the Rabbit/Turtle task, the overall restraint score during the Dinky Toys task, and the average latencies during the Waiting for Gift Bow task.

At T2, caregiver-reported attention shifting was marginally correlated with mother-reported attention shifting, mother-reported inhibitory control, and the observed measure during the Waiting for Gift Bow task,  $r_s(139-142) = .16$ , all  $p_s = .06$ . Mother-

reported attention focusing and caregiver-reported inhibitory control were also marginally correlated,  $r(144) = .15, p = .08$ . Additionally, the observed measures during the Rabbit/Turtle and Dinky Toys tasks were also marginally correlated,  $r(202) = .12, p = .096$ . The observed measure during the Dinky Toys task was not significantly correlated with mother-reported attention focusing and attention shifting, or caregiver-reported attention focusing, attention shifting, and inhibitory control. The observed measure during the Rabbit/Turtle task was not significantly correlated with mother-reported attention shifting and inhibitory control, or caregiver-reported attention focusing, attention shifting, and inhibitory control. The observed measure during the Waiting for Gift Bow task was not significantly correlated with mother-reported attention shifting or caregiver-reported attention focusing. Additionally, mother-reported attention shifting and caregiver-reported attention focusing were not significantly related. All other measures were significantly correlated (22 correlations total),  $r_s(141-223) = .16$  to  $.53, p_s = .03$  to  $< .001$ . In summary, there were five marginal correlations and 22 significant correlations, for a total of 27 marginal and significant correlations (out of 36 correlations total).

At T3, mother-reported attention focusing was marginally correlated with caregiver-reported attention focusing and the observed measure during the Dinky Toys task,  $r_s(147$  and  $188) = .16$  and  $.14, p_s = .05$ , respectively. Additionally, mother-reported attention shifting was marginally correlated with the observed measures during the Rabbit/Turtle and Waiting for Gift Bow tasks,  $r_s(187$  and  $186) = .14, p_s = .06$ , respectively. The observed measure during the Rabbit/Turtle task was not significantly correlated with mother-reported attention focusing, caregiver-reported attention focusing,

or caregiver-reported inhibitory control. Caregiver-reported attention shifting was not significantly correlated with mother-reported attention focusing, mother-reported attention shifting, or the observed measures during the Dinky Toys and Waiting for Gift Bow tasks. Caregiver-reported attention focusing was not correlated with mother-reported attention shifting or the observed measure during the Dinky Toys task. Caregiver-reported inhibitory control was not significantly related to mother-reported attention shifting or the observed measure during the Dinky Toys task. All other measures were significantly correlated (28 correlations total),  $r_s(143-205) = .16$  to  $.68$ ,  $p_s = .04$  to  $< .001$ . In summary, there were four marginal correlations and 28 significant correlations, for a total of 32 marginal and significant correlations (out of 36 correlations total).

At T4, mother-reported attention focusing was marginally correlated with caregiver-reported attention shifting and the observed measure during the Dinky Toys task,  $r_s(145$  and  $166) = .15$  and  $.14$ ,  $p_s = .08$  and  $.07$ , respectively. Caregiver-reported attention focusing was marginally correlated with mother-reported inhibitory control and the observed measure during the Rabbit/Turtle task,  $r_s(145$  and  $132) = .15$ ,  $p_s = .07$  and  $.09$ , respectively. Additionally, caregiver-reported attention shifting was marginally correlated with the observed measure during the Dinky Toys task,  $r(132) = .16$ ,  $p = .06$ . The observed measure during the Rabbit/Turtle task was not significantly correlated with mother-reported attention focusing and shifting, or caregiver-reported attention shifting. The observed measure during the Waiting for Gift Bow task was not significantly correlated with mother-reported attention focusing or caregiver-reported attention focusing, shifting, and inhibitory control. Mother-reported attention shifting was not

significantly correlated with caregiver-reported attention focusing, shifting, and inhibitory control or the observed measure during the Dinky Toys task. All other measures were significantly correlated (29 correlations total),  $r_s(131-189) = .17$  to  $.64$ ,  $p_s = .04$  to  $< .001$ . In summary, there were five marginal correlations and 29 significant correlations, for a total of 34 marginal and significant correlations (out of 36 correlations total).

Across time, mother-reported attention focusing was significantly correlated,  $r_s(180-196) = .48$  to  $.71$ ,  $p_s < .001$ . Mother-reported attention shifting was significantly correlated across time,  $r_s(177-193) = .18$  to  $.63$ ,  $p_s = .01$  to  $< .001$ . Mother-reported inhibitory control was significantly correlated across time,  $r_s(180-196) = .54$  to  $.71$ ,  $p_s < .001$ . Caregiver-reported attention focusing was significantly correlated across T2 and T3, and across T3 and T4,  $r_s(113$  and  $112) = .37$  and  $.48$ ,  $p_s < .001$ , respectively. Caregiver-reported attention focusing was not significantly correlated across T2 and T4. Caregiver reported attention shifting was significantly correlated across T2 and T3, and across T3 and T4,  $r_s(111) = .43$  and  $.31$ ,  $p_s < .001$ , respectively. Caregiver-reported attention shifting was not significantly correlated across T2 and T4. Caregiver-reported inhibitory control was significantly correlated across all three time points,  $r_s(108-114) = .25$  to  $.45$ ,  $p_s = .01$  to  $< .001$ . The observed measure of EC during the Rabbit/Turtle task was significantly correlated across T2 and T3, and across T3 and T4,  $r_s(181$  and  $166) = .24$  and  $.21$ ,  $p_s = .001$  and  $.01$ , respectively. The observed measure during the Rabbit/Turtle task was not significantly correlated across T2 and T4. The observed measure of EC during the Dinky Toys task was significantly correlated across T2 and T3, and across T3 and T4,  $r_s(188$  and  $167) = .15$  and  $.26$ ,  $p_s = .04$  and  $.001$ , respectively. The

observed measure during the Dinky Toys task was not significantly correlated across T2 and T4. The observed measure of EC during the Waiting for Gift Bow task was significantly correlated across all three time points,  $r_s(164-187) = .20$  to  $.42$ ,  $p_s = .01$  to  $< .001$ . Across-time and across-reporter correlations were also computed for the individual, reported measures of EC. These correlations can be seen in Tables 5, 6, and 7.

Although the attentional measures were each individually significantly related to inhibitory control for both reporters across all three times, the decision was made to combine the components of EC in a similar way as Spinrad et al. (2007). Spinrad et al. (2007) examined three different components of EC and the attentional components (i.e., attention focusing and shifting) were kept separate from the inhibitory control component. In the current study, attention focusing and attention shifting were combined within reporter at each time point to create separate composites of mother- and caregiver-reported attentional control. Mother-reported attention focusing and attention shifting were significantly correlated within each time point,  $r_s(189-220) = .21$  to  $.30$ ,  $p_s = .003$  to  $< .001$ . Caregiver-reported attention focusing and attention shifting were also significantly correlated within each time point,  $r_s(144-150) = .39$  to  $.53$ ,  $p_s < .001$ . The attentional composites were then combined with inhibitory control within reporter at each time point to create separate composites of mother- and caregiver-reported EC. Mother-reported attentional control and inhibitory control were significantly correlated within each time point,  $r_s(189-223) = .42$  to  $.70$ ,  $p_s < .001$ . Caregiver-reported attentional control and inhibitory control were also significantly correlated within each time point,  $r_s(145-150) = .57$  to  $.79$ ,  $p_s < .001$ . Finally, mother- and caregiver-reported EC were averaged within each time point to create a single measure of adult-reported EC at each

time point (based on each of these components significantly loading on the latent construct of EC in the Spinrad et al., 2007, study). Mother- and caregiver-reported EC were significantly correlated within each time point,  $r_s(145-148) = .23$  to  $.36$ ,  $p_s = .01$  to  $< .001$ . In this way, the adult-reported EC composite has an equal contribution from attentional measures (i.e., focusing and shifting) and the inhibitory control measure and approximately equal contributions for caregivers and mothers. The relations among the measures of EC can be seen in Table 8.

### **Relations of Observed Sympathy/Prosocial Behavior Within and Across Time**

At T2, T3, and T4, the measures of observed sympathy/prosocial behavior were hypothesis testing, direct prosocial behavior, and prosocial verbalizations during the E Hurt task. At T2, hypothesis testing and prosocial verbalizations were significantly correlated,  $r(215) = .27$ ,  $p < .001$ . Direct prosocial behavior was not significantly correlated with either hypothesis testing or prosocial verbalizations. At T3, direct prosocial behavior was significantly correlated with hypothesis testing and prosocial verbalizations,  $r_s(192) = .19$  and  $.18$ ,  $p_s = .01$ , respectively. Direct prosocial behavior was marginally correlated with prosocial verbalizations,  $r(192) = .14$ ,  $p = .06$ . At T4, prosocial verbalizations were significantly correlated with hypothesis testing and direct prosocial behavior,  $r_s(167) = .26$  and  $.32$ ,  $p_s = .001$  and  $< .001$ , respectively. Hypothesis testing was not significantly correlated with direct prosocial behavior. Hypothesis testing was only significantly correlated across T2 and T3,  $r(189) = .25$ ,  $p < .001$ . Direct prosocial behavior was only significantly correlated across T3 and T4,  $r(166) = .30$ ,  $p < .001$ . Prosocial verbalizations were significantly correlated across T2 and T3, as well as across T3 and T4,  $r_s(189$  and  $166) = .37$  and  $.20$ ,  $p_s < .001$  and  $.01$ . Measures of

prosocial verbalizations were marginally correlated across T2 and T4,  $r(166) = .14, p = .07$ . Relations among measures of observed sympathy/prosocial behavior can be seen in Table 9.

### **Relations of Reported Prosocial Behavior Within and Across Time**

At T2, T3, and T4, the measures of prosocial behavior were mother and father reports (four items each from the ITSEA). Mother- and father-reported prosocial behavior were significantly correlated within all three time points,  $r_s(118-159) = .26$  to  $.37, p_s = .004$  to  $< .001$ . Mother reports of prosocial behavior were significantly correlated across all three time points,  $r_s(180-196) = .51$  to  $.59, p_s < .001$ . Father reports of prosocial behavior were also significantly correlated across all three time points,  $r_s(102-121) = .46$  to  $.54, p_s < .001$ . The relations among measures of reported prosocial behavior can be seen in Table 10.

### **Relations of Maternal Personality Within Time**

At T1, maternal personality dimensions of Agreeableness and Conscientiousness were examined as potential predictors of maternal parenting (i.e., warmth, sensitivity, and structure). Agreeableness and Conscientiousness were significantly correlated at T1,  $r(244) = .21, p = .001$ . This correlation is presented in Table 11.

### **Confirmatory Factor Analyses**

It was initially decided early on that maternal warmth and sensitivity should be combined into one construct (i.e., become indicators of one latent factor of maternal warmth/sensitivity) because most of the individual measures of maternal warmth and sensitivity were significantly correlated within time (correlations among these measures within each time point can be seen in Tables 12, 13, and 14). CFAs were performed

separately on each construct (i.e., maternal warmth/sensitivity, maternal structure, EC, observed sympathy/prosocial behavior, and reported prosocial behavior), and then with all constructs in one CFA together (which also included correlations with maternal personality), both within each time point and with all constructs together across all time points. The full hypothesized CFA model can be seen in Figure 2.

The individual CFAs had relatively poor fit indices and no reasonable modifications (e.g., correlating error variances) were found to improve the fit of the models. In looking for good fit, the  $p$ -value for the chi-square should be non-significant, the comparative fit index (CFI) should be greater than .95, the root mean square error of approximation (RMSEA) should be less than .05, and the standardized root mean square residual (SRMR) should be less than .08 (based on cut-points for fit indices recommended by Hu & Bentler, 1999). The model for warmth/sensitivity was fairly poor:  $\chi^2(75) = 203.82, p < .001; CFI = .91; RMSEA = .08$  (90% Confidence Interval [CI] = .07 - .10);  $SRMR = .07$ , although all measures significantly loaded on their corresponding latent factors. The fit for the structure CFA initially was very poor:  $\chi^2(40) = 175.60, p < .001; CFI = .61; RMSEA = .11$  (90% CI = .10 - .13);  $SRMR = .11$ . Additionally, this model had a psi error suggesting that there was an issue with the T2 structure factor. Upon further investigation it was discovered that the likely reason for this was a correlation between the T2 and T3 factors that was greater than 1.0, which suggested that these factors were indistinguishable and may need to be combined into one factor. A second model for structure was investigated in which there were only two latent factors – one T1 factor and a second factor that was comprised of measures from T2 and T3. The fit of this model was still very poor:  $\chi^2(39) = 85.66, p < .001; CFI = .86; RMSEA = .07$

(90% CI = .05 - .09); *SRMR* = .10, and the two observed measures of structure at T3 did not significantly load on the T2/T3 factor. The model for EC had very good fit:  $\chi^2(48) = 57.34, p = .17$ ; *CFI* = .99; *RMSEA* = .03 (90% CI = .00 - .05); *SRMR* = .05, which was expected based on the results of Eisenberg et al. (2013). For the model with observed sympathy/prosocial behavior, some of the measures were skewed/kurtotic; all measures were thus dichotomized to be consistent across time. Due to the model using all categorical measures, *Mplus* used the integration algorithm which does not give model fit statistics or modification indices (MIs; Jöreskog & Sörbom, 1979) for the model. Thus, it was not clear whether the model fit reasonably well or if there were modifications that would improve the model (although all measures loaded significantly with the exception of T2 direct prosocial behavior). The model with reported prosocial behavior only had two indicators per factor, and thus was not identified; therefore, the model for reported prosocial behavior was run in conjunction with the EC model (due to the EC model having very good fit). Although this model had decent fit:  $\chi^2(115) = 165.14, p = .002$ ; *CFI* = .95; *RMSEA* = .04 (90% CI = .03 - .06); *SRMR* = .07 and all measures loaded significantly on their respective factors, the model was not without problems. In addition to the chi-square being significant, the model had a psi error that indicated a problem with the T3 reported prosocial behavior factor. Upon further investigation, it was discovered that the T3 factor was correlated greater than 1.0 with both the T2 and the T4 reported prosocial behavior factors and this problem was not able to be rectified.

Due to most of the models having less than good fit, additional CFA models were computed. Models were computed with all constructs within each time point, as well as with all constructs across all time points. Many models were computed looking at

different combinations of factors as well as combining time points for some factors. For example, models were computed where measures of structure were combined at T2 and T3, all parenting measures were combined into one factor across time (i.e., measures of warmth/sensitivity and structure were indicators of one latent construct), structure, observed sympathy/prosocial behavior, and/or reported prosocial behavior were dropped. However, the majority of these models had relatively poor fit and many of them also had various errors and problems with convergence that could not be fixed. Therefore, path analysis with measured variables was chosen to explore the relations among constructs. Robust maximum likelihood (MLR) was chosen as the estimator of the path models due to the T4 measure of observed sympathy/prosocial behavior having skewness greater than 2.0 and kurtosis greater than 7.0; the MLR estimator gives maximum likelihood estimates for parameters, but the standard errors and chi-square statistic are robust to non-normality. Before proceeding with path analysis, measured variables were first rescaled so that measures of each individual construct were on the same scale, and then the measures were averaged into composites for each of the constructs of interest (see Table 15 for correlations of constructs [composite measures] across time). Variables that comprised the individual constructs were rescaled such that all variables were on the larger of the scales (e.g., if variable 1 was on a 1-4 scale and variable 2 was on a 1-5 scale, variable 1 was rescaled to be on a 1-5 scale). Measures of warmth/sensitivity were rescaled at T1 and T2 to be on a 1-5 scale (with the exception of warmth during the Teaching task, which was already on a 1-5 scale). However, at T3, warmth during the Teaching task did not exceed a score of 4; therefore, measures of warmth/sensitivity at T3 were not rescaled. Measures of structure at all three time points were rescaled to be on

a 1-7 scale (with the exception of mother-reported reasoning, which was already on a 1-7 scale). Measures of EC at all three time points were rescaled to be on a 1-13 scale (with the exception of EC during the Rabbit/Turtle task, which was already on a 1-13 scale). For observed sympathy/prosocial behavior at all three time points, hypothesis testing was measured on a 1-3 scale, whereas direct prosocial behavior and prosocial verbalizations were both measured on a 1-4 scale. However, scores for direct prosocial behavior and prosocial verbalizations did not exceed scores of 3; therefore, measures of observed sympathy/prosocial behavior were not rescaled at any time point. Measures of reported prosocial behavior (i.e., from both mothers and fathers) were on the same 3-point scale (i.e., 0-2) and thus, were not rescaled at any time point.

### **Data Reduction**

Warmth/sensitivity consisted of an average of warmth during the Teaching task, maternal positive affect during both the Teaching and Free Play tasks, and maternal sensitivity during both the Teaching and Free Play tasks, at each time point. The majority of the measures of warmth/sensitivity were significantly correlated within each time point. At T1, there were eight significant correlations (out of ten total),  $r_s(245-246) = .17$  to  $.53$ ,  $p_s = .01$  to  $< .001$ . However, at T1, maternal positive affect during the Free Play task was not significantly correlated with sensitivity during the Teaching task and maternal positive affect during the Teaching task was not significantly correlated with sensitivity during the Free Play task. At T2, there were nine significant correlations (out of ten total),  $r_s(216) = .14$  to  $.55$ ,  $p_s = .046$  to  $< .001$ . At T2, maternal positive affect during the Free Play task was not significantly correlated with sensitivity during the Teaching task. At T3, there were nine significant correlations (out of ten total),  $r_s(192) =$

.16 to .63,  $ps = .03$  to  $< .001$ . At T3, maternal positive affect during the Teaching task was not significantly correlated with sensitivity during the Free Play task.

Structure was composed of an average of structure during the Free Play (clean-up portion) and “prohibition” toys tasks, as well as mother-reported reasoning at T1 and T2. At T1, all three measures of structure were significantly correlated,  $rs(227-241) = .17$  to  $.29$ ,  $ps = .01$  to  $< .001$ . At T2, there were two significant correlations (out of three total); structure during the Free Play task was significantly correlated with both mother-reported reasoning and structure during the “prohibition” toys task,  $rs(208$  and  $206) = .15$  and  $.27$ ,  $ps = .03$  and  $< .001$ . At T2, mother-reported reasoning was marginally correlated with structure during the “prohibition” toys task,  $r(201) = .13$ ,  $p = .07$ . At T3, structure was composed only of an average of structure during the Free Play (clean-up portion) and “prohibition” toys tasks, as mother-reported reasoning at T3 was not significantly correlated with either observed measure at that time point and was consequently dropped from further analyses. Structure during the Free Play and “prohibition” toys tasks were significantly related at T3,  $r(181) = .29$ ,  $p < .001$ .

EC was an average of adult-reported EC, overall restraint during the Dinky Toys task, the mean curve score from the Rabbit/Turtle task, and the average of all latencies in minutes (e.g., latency to open gift box) during the Waiting for Gift Bow task. The majority of the measures of EC were significantly correlated within each time point. At T2, there were three significant correlations (out of six total); EC during the Waiting for Gift Bow task was significantly correlated with all three of the other EC measures,  $rs(203-213) = .22$  to  $.30$ ,  $ps = .001$  to  $< .001$ . However, at T2, EC during the Dinky Toys task was marginally correlated with both EC during the Rabbit/Turtle task and adult-

reported EC,  $r_s(202 \text{ and } 211) = .12, p_s = .096 \text{ and } .09$ . Additionally, at T2, adult-reported EC was not significantly correlated with EC during the Rabbit/Turtle task. At T3, there were five significant correlations (out of six total),  $r_s(189-191) = .16 \text{ to } .46, p_s = .03 \text{ to } < .001$ . Additionally, at T3, adult-reported EC and EC during the Dinky Toys task were marginally correlated,  $r(192) = .13, p = .07$ . All measures of EC were significantly correlated at T4,  $r_s(166-168) = .18 \text{ to } .26, p_s = .02 \text{ to } .001$ .

Observed sympathy/prosocial consisted of an average of hypothesis testing, direct prosocial behavior, and prosocial verbalizations during the E Hurt task. At T2, direct prosocial behavior was not significantly related to either hypothesis testing or prosocial verbalizations, which was likely due to the low frequency of direct prosocial behavior at T2 (the majority of cases were scored as having no direct prosocial behavior). Because direct prosocial behavior could be viewed as an alternative way of helping than hypothesis testing or prosocial verbalizations, it was not discarded from the construct. However, at T2, hypothesis testing was significantly related to prosocial verbalizations,  $r(215) = .27, p < .001$ . At T3, direct prosocial behavior was significantly related to both hypothesis testing and prosocial verbalizations,  $r_s(192) = .19 \text{ and } .18, p_s = .01$ . Additionally, at T3, hypothesis testing and prosocial verbalizations were marginally correlated,  $r(192) = .14, p = .06$ . At T4, hypothesis testing and direct prosocial behavior were not significantly correlated but prosocial verbalizations were significantly related to both hypothesis testing and direct prosocial behavior,  $r_s(167) = .26 \text{ and } .32, p_s = .001 \text{ and } < .001$ .

Reported prosocial behavior was composed of mothers' and fathers' reports averaged together at each time point. Mother- and father-reported prosocial behavior

were significantly correlated at each time point,  $r_s(118-159) = .26$  to  $.37$ ,  $p_s = .004$  to  $< .001$ .

### **Relations of Study Variables with Sex**

Sex (0 = *girls*, 1 = *boys*) was significantly correlated with many of the main individual variables. Sex was significantly correlated with T1 sensitivity during Free Play, T1 structure during “prohibition” toys, T2 sensitivity during the Teaching task, T2 structure during Free Play, T2 and T3 EC during Waiting for Gift Bow, T3 adult-reported EC, and T4 father-reported prosocial behavior (girls were higher in every case),  $r_s(116-219) = -.14$  to  $-.21$ ,  $p_s = .03$  to  $.046$ . Sex was marginally correlated with T2 sensitivity during Free Play, T3 and T4 EC during Rabbit/Turtle, T3 adult-reported EC, T2 prosocial verbalizations, T2 mother-reported prosocial behavior, and T3 father-reported prosocial behavior (girls were higher in every case, except for T2 prosocial verbalizations, in which boys were higher),  $r_s(131-222) = -.12$  to  $.13$ ,  $p_s = .05$  to  $.08$ . Correlations were also run with the composite measures of variables that were used in the path analysis, in order to use sex as a covariate in the model. Sex was significantly correlated with T2 and T3 EC,  $r_s(204 \text{ and } 186) = -.18$  and  $-.19$ ,  $p_s = .01$  (girls were higher on both). However, sex was marginally correlated with T1 structure and T2 reported prosocial behavior,  $r_s(222 \text{ and } 223) = -.12$  and  $-.13$ ,  $p_s = .08$  and  $.06$  (girls were marginally higher on both). Sex was used as a covariate (i.e., predictor) of constructs that it was significantly or marginally correlated with.

## Path Model

### Full hypothesized model.

The initial hypothesized path model with manifest variables is presented in Figure 8 (this model includes the paths that were added based on the MIs, discussed below).

Because of the correlations with sex, sex was added as a covariate of T1 structure, T2 EC, T3 EC, and T2 reported prosocial behavior. Additionally, the reported measure of reasoning was dropped from the structure construct at T3 because it was not significantly correlated with either of the observed measures (i.e., structure during the Free Play and “prohibition” toys tasks). The hypothesized model was run in *Mplus* and was initially a poor fit to the data:  $\chi^2(87) = 244.08, p < .001; CFI = .84; RMSEA = .09$  (90% CI = .08 - .10);  $SRMR = .10$ . The MIs for this model suggested that the fit of the model could be improved by adding paths from T1 Agreeableness to T2 reported prosocial behavior, T1 maternal warmth/sensitivity to T3 maternal warmth/sensitivity, T1 maternal warmth/sensitivity to T2 maternal structure, T1 maternal structure to T3 maternal warmth/sensitivity, and T2 reported prosocial behavior to T4 reported prosocial behavior. The fit of the model did improve considerably with the addition of these paths, although the fit was still fair:  $\chi^2(82) = 142.52, p < .001; CFI = .94; RMSEA = .06$  (90% CI = .04 - .07);  $SRMR = .07$ .

All autoregressive paths were significant and positive ( $ps = .01$  to  $< .001$ ). The following cross-lagged paths were significant and positive: T1 maternal Agreeableness to T2 maternal structure, T1 maternal warmth/sensitivity to T2 EC, T2 maternal warmth/sensitivity to T3 EC, T2 maternal structure to T3 observed sympathy/prosocial behavior, and T3 maternal warmth/sensitivity to T4 observed sympathy/prosocial

behavior ( $p$ s = .02 to < .001). The cross-lagged path from T1 maternal Agreeableness to T2 maternal warmth/sensitivity was marginal and positive ( $p$  = .07), as was the path from T3 maternal warmth/sensitivity to T4 reported prosocial behavior ( $p$  = .08). Additionally, the paths that were added (based on the MIs) from T1 Agreeableness to T2 reported prosocial behavior, T1 to T3 maternal warmth/sensitivity, T1 maternal structure to T3 maternal warmth/sensitivity, T1 maternal warmth/sensitivity to T2 maternal structure, and T2 to T4 reported prosocial behavior were significant and positive ( $p$ s = .02 to < .001). All other cross-lagged paths were not significant.

The following within-time correlations among the constructs were significant and positive: T1 Agreeableness with T1 Conscientiousness (completely standardized  $\beta$  = .36,  $p$  = .002), T1 Agreeableness with T1 maternal warmth/sensitivity (completely standardized  $\beta$  = .26,  $p$  = .047), T1 Conscientiousness with T1 maternal warmth/sensitivity (completely standardized  $\beta$  = .28,  $p$  = .01), T1 Conscientiousness with T1 maternal structure (completely standardized  $\beta$  = .26,  $p$  = .003), T1 maternal warmth/sensitivity with T1 maternal structure (completely standardized  $\beta$  = .40,  $p$  < .001), T2 maternal warmth/sensitivity with T2 maternal structure (completely standardized  $\beta$  = .15,  $p$  = .046), T2 maternal structure with T2 EC (completely standardized  $\beta$  = .18,  $p$  = .01), T2 observed sympathy/prosocial behavior with T2 reported prosocial behavior (completely standardized  $\beta$  = .17,  $p$  = .01), and T3 maternal warmth/sensitivity with T3 EC (completely standardized  $\beta$  = .26,  $p$  < .001). The correlation between T1 maternal Agreeableness and T1 maternal structure was marginal and positive (completely standardized  $\beta$  = .20,  $p$  = .05). Additionally, the correlation between T3 EC and T3 maternal structure was also marginal and positive (completely

standardized  $\beta = .15, p = .06$ ). All other within time correlations were not significant. It is important to note that the correlations between constructs actually represent correlations among the disturbances (i.e., residual variances) of the constructs because they are all endogenous variables (except for the T1 maternal personality measures which are exogenous variables, thus the relation between these constructs represents an actual correlation between constructs).

Sex was a significant, negative predictor of T3 EC ( $p = .01$ ), which suggested that girls were higher in EC at T3 than boys. Sex was a marginal, negative predictor of T2 reported prosocial behavior ( $p = .08$ ), which suggested that girls were marginally higher on reported prosocial behavior at T2 than boys. Sex was not a significant predictor of T1 structure or T2 EC. This path model can be seen in Figure 8, which shows the significant, marginal, and non-significant autoregressive and across-time paths, as well as the significant and marginal within-time correlations. All within-time relations among constructs, regardless of significance, can be seen in Table 16. Similarly, estimates for all paths, regardless of significance, can be seen in Table 17.

Mediation was only pursued when *both* paths involved in the indirect relation were at least marginal ( $p < .10$ ). For example, the mediated effect of T2 EC was not pursued in the relation between T1 maternal warmth/sensitivity and T3 reported prosocial behavior (i.e., T1 warmth/sensitivity  $\rightarrow$  T2 EC  $\rightarrow$  T3 reported prosocial behavior) because T2 EC did not marginally or significantly predict T3 reported prosocial behavior (even though the path from T1 maternal warmth/sensitivity to T2 EC was significant). As such, the following two mediated effects were tested by using MODEL INDIRECT in *Mplus*: the mediated effect of T2 maternal warmth/sensitivity on the relation between

Agreeableness at T1 and EC at T3 (T1 Agreeableness marginally predicted T2 maternal warmth/sensitivity, and T2 maternal warmth/sensitivity significantly predicted T3 EC) and the mediated effect of T2 maternal structure on the relation between Agreeableness at T1 and observed sympathy/prosocial behavior at T3 (T1 Agreeableness significantly predicted T2 maternal structure, and T2 maternal structure significantly predicted T3 observed sympathy/prosocial behavior).

Bootstrapping was used to create 1000 samples in order to calculate standard errors (SEs) for the model. The model was a fair fit to the data:  $\chi^2(82) = 135.03, p < .001$ ;  $CFI = .94$ ;  $RMSEA = .05$  (CI = .04 - .07);  $SRMR = .07$ . *Mplus* does not produce *p*-values for standardized estimates with bootstrapping, so the above model was run without the bootstrapped SEs in order to obtain the *p*-values for the fully standardized estimates. Compared to the path model without mediation (Figure 8), the mediated path model (Figure 9) had only one difference in significance level for any of the paths or correlations – the within-time correlation between T3 EC and reported prosocial behavior was not significant (it had previously been marginal). Neither of the mediated effects was significant; the mediated effect of T2 maternal warmth/sensitivity on the relation between T1 Agreeableness and T3 EC was not significant (fully standardized beta = .02,  $p = .19$ ) and the mediated effect of T2 maternal structure on the relation between T1 Agreeableness and T3 observed sympathy/prosocial behavior was also not significant (fully standardized beta = .03,  $p = .12$ ). Figure 9 shows the mediated paths that were tested.

To summarize the findings, latent factor models (i.e., CFAs) were initially pursued to examine relations among the constructs. However, due to these models having

poor fit, no reasonable MIs, errors, and/or problems with convergence, path models with manifest (i.e., measured) variables were explored to examine the relations among constructs. Each construct was comprised of an average of the measured variables for that particular construct (variables were averaged only after being rescaled so that measures of each individual construct were on the same scale). The reported measure of structure at T3 (i.e., reasoning) was not significantly correlated with either of the observed measures of structure at T3 (i.e., structure during the Free Play or “prohibition” toys tasks); therefore, reasoning was dropped from the structure construct at T3 only.

Constructs in the path model (i.e., maternal warmth/sensitivity, maternal structure, EC, observed sympathy/prosocial behavior, and reported prosocial behavior) were stable across time. Conscientiousness did not significantly predict either maternal warmth/sensitivity or maternal structure at T2, whereas Agreeableness did marginally predict maternal warmth/sensitivity at T2 and significantly predicted maternal structure and reported prosocial behavior at T2 (the latter path was added based on the model MIs). T1 maternal warmth/sensitivity significantly, positively predicted T2 EC, T2 maternal structure, and T3 maternal warmth/sensitivity (note that the latter two paths were added based on the model MIs). T1 maternal structure predicted T3 maternal warmth/sensitivity (this path was added based on the model MIs). T2 maternal warmth/sensitivity was a significant, positive predictor of T3 EC. T2 maternal structure was a significant, positive predictor of T3 observed sympathy/prosocial behavior. T2 reported prosocial behavior was a significant, positive predictor of T4 reported prosocial behavior (this path was added based on the model MIs). T3 maternal warmth/sensitivity was a significant, positive predictor of T4 observed sympathy/prosocial behavior and was a marginal,

positive predictor of T4 reported prosocial behavior. Unfortunately, maternal structure and EC did not significantly predict reported prosocial behavior across any time point. Additionally, EC did not significantly predict observed sympathy/prosocial behavior across any time point and maternal warmth/sensitivity at T1 and T2 did not predict either observed sympathy/prosocial behavior or reported prosocial behavior at T2 or T3, respectively. Mediation analyses were pursued for two indirect relations, although the relation of maternal personality to EC was not mediated by maternal warmth/sensitivity and the relation of maternal personality to children's sympathy/prosocial behavior was not mediated by maternal structure.

## Discussion

The goals of this research project were to examine the relations among mothers' personality dimensions (i.e., Agreeableness and Conscientiousness), maternal positive parenting (i.e., warmth, sensitivity, and structure), children's regulation, and children's sympathy/prosocial behavior across time. Specifically, the main goals were to examine whether Agreeableness and Conscientiousness were predictors of maternal warmth/sensitivity and structure, whether maternal warmth/sensitivity was a predictor of children's regulation (i.e., EC), whether maternal warmth/sensitivity and maternal structure were predictors of children's sympathy/prosocial behavior (both reported and observed), and also whether EC was a predictor of children's sympathy/prosocial behavior. Another goal of this research project was to see if maternal warmth/sensitivity mediated the relation between Agreeableness and EC, whether maternal warmth/sensitivity and/or maternal structure mediated the relation between Agreeableness and/or Conscientiousness and children's sympathy/prosocial behavior, and whether EC mediated the relation between maternal warmth/sensitivity and children's sympathy/prosocial behavior.

In path analysis, Agreeableness at T1 (18 months) marginally predicted T2 (30 months) maternal warmth/sensitivity and significantly predicted maternal structure at T2 (30 months). These results are somewhat in line with the hypotheses for the current study. Agreeableness was hypothesized to be positively related to maternal structure, as Prinzie et al. (2009) demonstrated in their meta-analysis. However, it is worth noting that individuals high on Agreeableness may be influenced by social desirability and this could account for the relation between maternal Agreeableness and structure in the current

study. In the current study, the tasks in which maternal structure was observed (i.e., “prohibition” toys and the clean-up portion of the Free Play task) began with an experimenter telling the mother that she did not want their child to play with the “prohibition” toys. During the “clean-up” portion of the Free Play task, experimenters asked mothers to have their children clean up the toys that the dyad had been playing with. Because the personality dimension of Agreeableness includes socially desirable characteristics (e.g., kindness, cooperativeness), it is possible that mothers who tend to portray themselves in ways that are favorable to others are also likely to describe themselves as being high in Agreeableness (Graziano & Tobin, 2002). It is possible that during these tasks, mothers who were higher on Agreeableness were trying to please the experimenter by complying with the experimenter’s requests.

Agreeableness was also hypothesized to be positively related to maternal warmth/sensitivity based on previous literature that suggested that people who are high in Agreeableness are likely to have a desire to develop and maintain positive social interactions and relationships with others (Graziano et al., 1997; Jensen-Campbell & Graziano, 2001; Tobin et al., 2000). However, in the current study, Agreeableness only marginally predicted maternal warmth/sensitivity (although this path was positive), which is in line with the marginal, positive zero-order correlation between T1 (18 months) Agreeableness and T2 (30 months) maternal warmth/sensitivity in Table 15. Perhaps Agreeableness is more strongly related to warmth than to sensitivity, and when combining warmth and sensitivity some prediction by Agreeableness is lost. Specifically, perhaps the desire for positive social interactions/relationships (an aspect of Agreeableness) is related more to positive affect (an aspect of parental warmth) than it is

to parental sensitivity (e.g., following others' cues, being responsive in a contingent and consistent way). However, researchers have found that Agreeableness is related to both warmth and sensitivity (or aspects of these constructs) as individual constructs, so this is not likely the case (Belsky et al., 1995; Clark et al., 2000; Smith et al., 2007).

It is important to note that, in the current study, means were quite low for most of the measures of maternal warmth and sensitivity, and this was especially true for maternal warmth that was measured by mothers' positive affect. When variables have low means, this suggests that there is little variability in the measures. As such, little variability in measures will lead to a weaker relation with other constructs. Mothers' positive affect was assessed in a semi-unstructured laboratory task and it is possible that the nature of the tasks was such that they did not elicit strong instances of positive affect (e.g., intense or prolonged smiling/laughing) or that mothers did not feel comfortable showing these types of emotional displays in the laboratory environment. In the future, it would be interesting to examine whether naturalistic observations of mothers and children (or observations in a familiar context such as the home environment) would elicit more intense displays of maternal positive affect, and as such perhaps Agreeableness would be more strongly related to these measures of maternal warmth.

Additionally, the weak relations between maternal Agreeableness and maternal warmth/sensitivity (both in the path model and in zero-order correlations) could be due to the different methods used to assess each construct. Some researchers have not found relations between mothers' personality and their parenting behaviors when the former was assessed via self-reports and the latter was observed (e.g., Karreman, van Tuijl, van Aken, & Deković, 2008a; Kochanska et al, 1997). Questionnaire measures of parenting

behaviors are likely to uncover parents' attitudes and beliefs about behavior, whereas observations of parenting behavior are likely to reflect behaviors that are specific to the situation or context (see Bornstein, Cote, & Venuti, 2001). Therefore, stronger relations may be found between parental personality and parenting behaviors when similar methods are used to assess each.

Conscientiousness at T1 (18 months) did not significantly predict either maternal warmth/sensitivity or maternal structure at T2 (30 months). This is contrary to the prediction that Conscientiousness would be positively related to both aspects of parenting, perhaps due to parents' purposefulness and sense of competence, particularly in their parenting role. The pattern of prediction in the path model was somewhat in line with zero-order correlations between T1 (18 months) Conscientiousness and T2 (30 months) maternal warmth/sensitivity and T2 (30 months) maternal structure: Conscientiousness was not significantly correlated with T2 (30 months) maternal warmth/sensitivity and was marginally correlated with T2 (30 months) maternal structure in zero-order correlations.

Researchers have often found associations between Conscientiousness (or related aspects such as competence) and parenting constructs such as warmth/sensitivity and structure (Asscher et al., 2008; Prinzie et al., 2009; Smith et al., 2007). However, across the literature, there are varying ways that researchers have defined measures of parenting. For instance, Prinzie et al. (2009) used a very broad definition of structure (which they called behavioral control) in their meta-analysis, which also included components of sensitivity. Although structure is often conceived as a constellation of different, albeit related, parenting behaviors, it is worth questioning what particular aspects of structure

drive the relation to Conscientiousness. In the current study, the measure of structure was relatively narrowly defined and focused primarily on positive control aspects of structure (e.g., gentle verbal control versus forceful verbal or physical control), as well as reasoning. Perhaps a broader measure of structure would have yielded significant results more in line with the literature. Furthermore, because there was a marginal zero-order correlation between maternal Conscientiousness at T1 (18 months) and maternal structure at T2 (30 months), it could be that the model tested in the current study did not have enough power to detect even marginal prediction from Conscientiousness to structure.

It is also important to consider what characteristics (or facets) of personality dimensions some measures of personality are actually tapping in to. For instance, it was predicted in the current study that competence (a characteristic of Conscientiousness) would be related to maternal sensitivity and structure. Indeed, Asscher et al. (2008) found that mothers' perceived sense of competence as a parent related to their sensitivity toward their child. However, the brief 7-item measure of Conscientiousness used in the current study did not tap into mothers' general sense of competence, and more specifically, did not assess traits as they relate directly to parenting. That is, mothers' were not asked directly about their reliability and consistency in terms of responding to their children, although one would expect that general reliability and consistency would extrapolate to the context of parenting. Interestingly, Smith et al. (2007) did not find relations between maternal Conscientiousness at 18 months and mothers' positive affect at 30 months (although they did find significant relations within time at 18 months). Additionally, Smith et al. (2007) did find a significant direct relation between maternal Conscientiousness at 18 months and mothers' sensitivity at 30 months. Perhaps maternal

Conscientiousness is not related to maternal warmth as measured in the current study (i.e., mostly by positive affect and affection toward the child), but is related to sensitivity; because maternal warmth and sensitivity were combined in the current study, it was not possible to determine whether maternal Conscientiousness differentially predicted these two constructs.

Maternal warmth/sensitivity significantly predicted EC across the first two time points, but not at the third time point. That is, T1 (18 months) and T2 (30 months) maternal warmth/sensitivity significantly predicted EC at T2 (30 months) and T3 (42 months), respectively; however, T3 (42 months) maternal warmth/sensitivity did not significantly predict T4 (54 months) EC. This was in contrast to the assumption that maternal warmth/sensitivity would positively predict EC across all three time points. However, this finding is in line with zero-order correlations, which show that T1 (18 months) and T2 (30 months) maternal warmth/sensitivity was significantly correlated with T2 (30 months) and T3 (42 months) EC, respectively, but that T3 (42 months) maternal warmth/sensitivity was not significantly correlated with T4 (54 months) EC. Additionally, this finding is consistent with similar results (which used the same sample) from Spinrad et al. (2012), in which maternal warmth/sensitivity at 30 months predicted children's EC at 42 months, but did not predict from 42 to 54 months. Spinrad et al.'s (2012) measure of maternal warmth/sensitivity was very similar to the one used in the current study (the same measures were used with the exception of the two positive affect measures used in the current study that were thought to represent maternal warmth).

In the current study, maternal warmth/sensitivity had no significant impact on EC at the later age. This is likely to be due to the immaturity of children's regulatory

abilities, which are just starting to emerge and develop in the first and second years of life, and the rapid development of these abilities that is occurring in the third and fourth years of life (Kochanska et al., 2000; Garon, Bryson, & Smith, 2008; Rothbart & Bates, 2006). Perhaps maternal warmth/sensitivity has a stronger effect on children's EC in the very early years when children's regulatory abilities are just starting to flourish. This is not to say that maternal warmth/sensitivity (or positive parenting more generally) is no longer important to children's EC at later ages, as researchers have found relations between maternal warmth or positive expressivity and elementary-aged children's and early adolescents' EC (e.g., Eisenberg, Zhou, et al., 2005; Valiente et al., 2006), but perhaps other types of parenting have more of an effect than maternal warmth/sensitivity. For instance, Spinrad et al. (2012) suggested that the effect of negative parenting (e.g., controlling, intrusiveness) may have a greater (negative) impact on children's EC at later ages than the positive impact from maternal warmth/sensitivity. In a meta-analysis, Karreman, van Tuijl, van Aken, & Deković (2006) have suggested that the strength of the relation between parenting and children's EC may indeed depend on the aspect of parenting that is assessed; that is, they provided evidence for a stronger relation between controlling parenting and children's EC than was found for supportive parenting and children's EC. As children change and develop over time (especially in terms of their EC), it is likely that parenting styles change as well, and parenting that had a strong impact on children's development of EC in the early years is no longer pertinent.

Maternal warmth/sensitivity at T1 (18 months) and T2 (30 months) did not significantly predict observed sympathy/prosocial behavior at T2 and T3 (30 and 42 months), respectively; however, T3 (42 months) maternal warmth/sensitivity did

significantly predict T4 (54 months) observed sympathy/prosocial behavior. These findings were somewhat in line with zero-order correlations, particularly for the two earlier time points; however, the zero-order correlation between T3 (42 months) maternal warmth/sensitivity and T4 (54 months) observed sympathy/prosocial behavior was marginal. Warmth/sensitivity at T1 and T2 (18 and 30 months) also did not significantly predict reported prosocial behavior at T2 and T3 (30 and 42 months), but T3 (42 months) warmth/sensitivity marginally predicted reported prosocial behavior at T4 (54 months). These findings were also somewhat in line with the zero-order correlations, especially for the two earlier time points; however, the zero-order correlation between T3 (42 months) maternal warmth/sensitivity and T4 (54 months) reported prosocial behavior was not significant. It is possible that 18 and 30 months (Times 1 and 2 in the current study) may be too early to detect relations between maternal warmth/sensitivity and children's sympathy/prosocial behavior. During this time period, children are just beginning to develop other-oriented concern and prosocial behavior and instances of these behaviors and emotions are likely to be quite low as well as fairly rudimentary (Eisenberg, Fabes, et al., 2006). As sympathy and prosocial behavior develop over time, maternal warmth/sensitivity may become a stronger predictor. Additionally, maternal warmth/sensitivity may affect children's sympathy and/or prosocial behavior via the internalization of parental values, which happens over time. Thus, it would be beneficial to expand research on similar constructs by investigating relations over a longer period of time.

Alternatively, other methods of parental socialization may be more important than warmth/sensitivity during the early toddler years, when children's prosocial behavior is

just beginning to develop. Even though prosocial behavior is rudimentary when children are between 18 and 30 months, Brownell, Svetlova, Anderson, Nichols, and Drummond (2013) found that parents' discussion of emotions with their toddlers at these ages predicted their children's prosocial behaviors (helping and sharing with an adult experimenter). Perhaps at these very early ages it is parents' talk about emotions (especially others' emotions), and eliciting their children to label and explain emotions, that prompts children's prosocial behaviors.

It is important to also note that the observed and reported measures of sympathy and/or prosocial behavior are likely to be measuring slightly different aspects of sympathy/prosocial behavior (Edwards et al., 2015). The observed measures are likely to assess children's sympathetic and prosocial responses to an unfamiliar adult, whereas the reported measures, which are based on the perceptions of familiar adults, are likely to assess children's responses toward familiar others. Perhaps the difference in prediction from maternal warmth/sensitivity to observed versus reported sympathy and/or prosocial behavior stems from the aforementioned differences in these two constructs. That is, maternal warmth/sensitivity may be more important in the development of sympathy and prosocial behavior toward *unfamiliar* others than it is for familiar others. In recent work, Padilla-Walker, Dyer, Yorgason, Fraser, and Coyne (2015) were not able to classify adolescents' prosocial behavior toward strangers in their growth mixture model, but they did find that maternal warmth/support distinguished between classes of prosocial behavior toward familiar others (i.e., friends and family). Padilla-Walker et al. (2015) have asserted the usefulness of examining prosocial behavior as a function of different

targets (e.g., friends, family, strangers) and the need for further research on predictors and correlates of prosocial behavior toward different targets.

Maternal structure at T1 and T3 (18 and 42 months) did not significantly predict observed prosocial behavior at T2 and T4 (30 and 54 months), respectively; however, T2 (30 months) maternal structure did significantly predict T3 (42 months) observed sympathy/prosocial behavior. It is possible that maternal warmth/sensitivity begins to have an effect on observed sympathy/prosocial behavior at later ages and the effect of maternal structure drops out. As discussed earlier, other methods of socialization not examined in the current study (such as parental emotional discourse) may be influencing children's burgeoning sympathy/prosocial behavior in the very early toddler years, but maternal structure becomes important as children develop (and has a stronger relation to children's sympathy/prosocial behavior than maternal warmth/sensitivity). As children continue to age, perhaps maternal warmth/sensitivity has a stronger relation with children's sympathy/prosocial behavior and diminishes the effect of maternal structure. Additionally, it is important to consider the reasoning component of maternal structure and its likely effect on children's sympathy/prosocial behavior, as has been demonstrated in much of the literature (see Eisenberg, Fabes, et al., 2006). At T3 (42 months), reported reasoning was not included in the maternal structure construct because it was not significantly correlated with the two observed measures of structure. The current measure of reasoning was based on a single item reported by mothers; it is possible that by including a more extensive measure of reasoning in the construct of maternal structure, especially at later ages, the relation between maternal structure and children's sympathy/prosocial behavior would be stronger. In either case, more investigation is

warranted into the nature of the effect of maternal structure on observed sympathy/prosocial behavior over time in order to see if the results of the current study are replicated.

Additionally, maternal structure did not significantly predict reported prosocial behavior across any time point, which is somewhat inconsistent with the zero-order correlations. In zero-order correlations, T1 (18 months) maternal structure was not significantly correlated with T2 (30 months) reported prosocial behavior, but T2 and T3 (30 and 42 months) maternal structure were significantly correlated with T3 and T4 (42 and 54 months) reported prosocial behavior, respectively (although the correlations were relatively weak at  $r = .17$  and  $.15$ , respectively). It is possible that these weak relations were not able to be detected in the path model due to lack of power. However, the differences in observed versus reported sympathy and/or prosocial behavior described previously are an alternative explanation for this finding. If maternal structure is actually related to reported prosocial behavior as indicated in the correlations (and the lack of relations in the model, particularly at older ages, were due to the low sample size combined with a complex model including multiple predictors), then maternal structure may be influential in the development of children's sympathy/prosocial behavior toward familiar others, particularly as children age.

EC did not significantly predict observed sympathy/prosocial behavior or reported prosocial behavior across any time point, which is consistent with zero-order correlations but not consistent with hypotheses for the current study or previous literature (e.g., Eisenberg et al., 2007; Eisenberg, Fabes, et al., 2006; Eisenberg, Spinrad, et al., 2006; Valiente et al., 2004).

EC is starting to develop and increase over the time period examined in the current study, and when matched with children's very rudimentary abilities regarding other-oriented concern (i.e., sympathy) and prosocial behavior, it is possible that the time points examined were too early to discern relations between EC and sympathy/prosocial behavior. Many researchers have found relations between EC and sympathy and/or prosocial behavior, albeit at older ages (e.g., Eisenberg, Fabes, Karbon, et al., 1996; Eisenberg, Fabes, et al., 1998; Eisenberg et al., 2007; Murphy, Shepard, Eisenberg, Fabes, & Guthrie, 1999; Rothbart et al., 1994). However, relations between EC and sympathy/prosocial behavior should be at least moderate by the later time points examined in the current study, when children's proficiencies in these domains are rapidly increasing. For example, Eisenberg, Fabes, Murphy, et al. (1996) found that children's regulation when children were 43 to 68 months of age was related to their sympathy approximately 2 years later (when children were 6 to 8 years old). Although they examined regulation at a similar age as the current study, relations with sympathy were found over a longer period of time; therefore, it is possible that relations between EC and sympathy and/or prosocial behavior are not evident until children are older and these relations should be examined over a longer period of time than was done in the current study.

Based on modification indices, a path was added from T1 (18 months) Agreeableness to T2 (30 months) reported prosocial behavior, which suggested that maternal Agreeableness directly predicts children's parent-reported prosocial behavior, at least at early ages. Although this direct relation was not hypothesized, it was in line with zero-order correlations. Very few researchers have examined the relations between parent

personality (particularly Agreeableness) and children's prosocial behavior. One such study found that parental Agreeableness was related to older children's sympathy, but not to their prosocial behavior (Michalik, 2005). The measure of prosocial behavior in the current study assessed empathy/sympathy in addition to prosocial behavior, which could explain the prediction from maternal Agreeableness. That is, parental Agreeableness may be related more to children's empathy/sympathy than to their prosocial behavior, especially at early ages. Children's modeling of traits inherent to parents' Agreeableness (such as sympathy and altruism; Costa & McCrae, 1995; Costa et al., 1991) may also contribute to children's empathy/sympathy. Additionally, genetic factors are also likely to be operating, such that children inherit sympathetic or prosocial traits from parents who are higher on Agreeableness. There is also the possibility that maternal Agreeableness and reported sympathy/prosocial behavior were related in the current study as a result of shared method variance due to these constructs both being assessed by parental reports. Alternatively, mothers higher in Agreeableness may place a higher value on concern for others and prosocial behaviors and, in turn, perceive their children as being higher in sympathy/prosocial behavior. In the current study, the parents' reports assessed empathy/sympathy and prosocial behavior, so it is impossible to determine and disentangle how relations differ for reported measures of children's empathy/sympathy versus their prosocial behavior. However, because research on this relation is scarce, more work should be done to determine if this relation is present over time, and if there are possible mediators of this relation. Additionally, future work should also examine the relations between parental Agreeableness and parental reports of children's empathy-related responding by examining empathy/sympathy and prosocial behavior separately.

There were a number of hypotheses regarding mediated effects; however, mediation analyses were only pursued for indirect effects in which *both* of the paths involved were either marginal or significant ( $p < .10$ ). As such, only two mediated effects were examined: the mediated effect of T2 (30 months) maternal warmth/sensitivity on the relation between maternal Agreeableness at T1 (18 months) and EC at T3 (42 months) and the mediated effect of T2 (30 months) maternal structure on the relation between maternal Agreeableness at T1 (18 months) and observed sympathy/prosocial behavior at T3 (42 months). Unfortunately, neither of the mediated effects was significant. It is possible that in both cases there is another explanatory variable that was not examined in the current study. For instance, perhaps instead of maternal warmth/sensitivity, it is actually genetics or children's modeling of maternal characteristics related to Agreeableness which explains the relation between mothers' Agreeableness and children's EC. Agreeableness has been related to EC in children and adults (e.g., Cumberland-Li, Eisenberg, & Reiser, 2004; Jensen-Campbell et al., 2002); therefore, it is possible that children are modeling aspects of their parents' regulatory abilities and this modeling is the mediator of the relation between maternal Agreeableness and children's EC. Or perhaps children with parents who are higher on Agreeableness are genetically predisposed to be both higher in Agreeableness and EC themselves. The same may be true for the mediated effect of maternal structure on the relation between maternal Agreeableness and children's observed sympathy/prosocial behavior, such that children are likely to be predisposed to be higher in prosocial behavior if their parents are high in Agreeableness or they are likely to model their parents' sympathetic and prosocial tendencies.

Based on a modification index, an unpredicted path was also added from T1 (18 months) maternal warmth/sensitivity to T2 (30 months) maternal structure (note that this path was also consistent with the zero-order correlation), which suggests that mothers' warmth/sensitivity when their children were 18 months old (Time 1) predicts their use of structure when their children were 30 months (Time 2). However, modification indices did not indicate that this path should be added at older ages, although in zero-order correlations, T2 (30 months) maternal warmth/sensitivity was significantly correlated with T3 (42 months) maternal structure. The underpinnings of maternal structure include giving clear and consistent guidelines and expectations to the child, as well as being appreciative of the child's maturity level and matching these guidelines and expectations to the child's developmental capabilities. As such, it is likely that mothers who are appropriately attentive to their child and follow their child's signals for stimulation during interactions (i.e., mothers who are high on maternal sensitivity) are also likely to be consistent and developmentally appropriate when they are attempting to gain compliance to rules and expectations from their child (i.e., structure). Being appropriately attentive and responsive to one's child (i.e., sensitivity) could affect one's sensitivity in setting developmentally appropriate limits and expectations for their child (i.e., structure). Perhaps this is more likely to be true at younger ages, when children have not yet internalized parental rules and values. Future research should investigate the nature of the relation between maternal warmth/sensitivity and structure, and whether this relation is present across longer periods of time and at older ages.

Conversely, modification indices suggested that a path be added from T1 (18 months) maternal structure to T3 (42 months) maternal warmth/sensitivity, which

suggests that mothers' use of structure affects their warmth/sensitivity over time. Modification indices did not suggest that this path should be added across adjacent time points, although these measures were significantly correlated across adjacent time points (i.e., T1 [18 months] maternal structure was correlated with T2 [30 months] maternal warmth/sensitivity and T2 [30 months] maternal structure was correlated with T3 [42 months] maternal warmth/sensitivity; based on zero-order correlations). Perhaps when parents interact with children in situations that require limit setting and reminding of rules (i.e., structure), parents become more aware of their children's developmental abilities and are more able to respond appropriately and contingently (i.e., sensitivity). By interacting positively with children in such situations, parents may develop more positive affect toward children and become more sensitive in response to their children's behavior. It would be interesting to examine the likely bidirectional relations between maternal warmth/sensitivity and structure, and also to determine whether these constructs predict each other across adjacent time points, and even whether they might interact to predict children's outcomes.

A path was also added from T1 to T3 (18 to 42 months) warmth/sensitivity, which suggests that this construct shared something across T1 and T3 (18 and 42 months) that was not present at T2 (30 months). Similarly, a path was added from T2 to T4 (30 to 54 months) reported prosocial behavior, which also suggests that this construct shared something across T2 and T4 (30 and 54 months) that was not present at T3 (42 months). Because these paths were guided by model modification indices and were not hypothesized, more investigation needs to be done on the implications of these paths. Although, it is possible that these relations are due to issues with the model and further

analyses should be computed with a larger sample size to determine if the results of the current study are consistent.

In analyses, gender was used as a covariate as needed. Girls were higher in T3 (42 months) EC, which is not surprising as many researchers have found that girls are reported and observed to be higher in regulation than boys in the toddler and preschool years (e.g., Kochanska et al., 2000; Spinrad et al., 2012), although some researchers have found these differences only for one reporter (i.e., teachers) and not in observed measures of regulation in middle childhood (Eisenberg, Sadovsky, et al., 2005). Girls were also marginally higher in reported prosocial behavior at T2. Previous literature suggests that girls tend to be higher in sympathy and prosocial behavior, although results have been varied depending on the index used to measure these constructs (e.g., Eisenberg & Fabes, 1998; Eisenberg, Fabes, et al., 2006; Hastings et al., 2000).

The current study provides some interesting findings, even though many hypotheses, including those pertaining to mediation, were not fully supported. The current findings provide preliminary evidence for the role of mothers' Agreeableness in their positive parenting behaviors (i.e., structure and, to a lesser degree, warmth/sensitivity) and, to some degree, children's prosocial behavior. Positive parenting behaviors may also impact children's sympathy/prosocial behavior, particularly as children age. Maternal warmth/sensitivity seems to impact children's regulation, especially when children are young and regulatory abilities are just beginning to develop; however, children's regulation does not appear to impact their sympathy/prosocial behavior at these young ages. The current results highlight the need to examine positive

parenting and children's outcomes over a longer period of time as children age and gain mastery over abilities such as self-regulation, sympathy, and prosocial behavior.

Future research should generally examine a larger, more diverse sample over a longer period of time in order to further explore the relations between constructs investigated in the current study, and to determine whether findings of the current study remain consistent or change over time. Expanding the longitudinal nature of the current study would be especially important for constructs such as EC and sympathy/prosocial behavior, which are just starting to develop and increase across the time periods examined in the current study. Future researchers examining similar constructs might include both observed and reported measures of each construct, as well as obtain observational measures across multiple contexts. Not only would this provide insight into the pattern of relations among observed and reported measures (e.g., perhaps by examining the factor structure when these measures are included together in CFAs), but it would also provide a stronger index of the constructs examined in the current study (and similar constructs). Additionally, naturalistic observations or observations in familiar environments may be helpful in eliciting responses such as maternal positive affect and could potentially be important contexts for observing other parenting behaviors as well. This is likely to be true for children's prosocial behavior as well; by examining prosocial behavior in multiple contexts and with multiple recipients (e.g., in strange and familiar environments, with strangers, with familiar adults and children), researchers can better elucidate how prosocial behavior is related to and predicted by parents' characteristics and aspects of the child's own temperament (e.g., EC).

Inclusion of fathers in studies examining parent characteristics and parenting behaviors has been relatively lacking across studies. More recently, researchers have taken note of this shortcoming and have begun to include information from fathers in their studies and have recognized the importance of coparenting on children's outcomes (e.g., Karreman, van Tuijl, van Aken, & Deković, 2008b; Scrimgeour, Blandon, Stifter, & Buss, 2013). Future researchers should continue this trend of including valuable information from fathers in order to determine how mothers and fathers differentially respond to their children and how characteristics of each parent predicts children's outcomes. Additionally, because the family is a system, the interaction between parents in raising and coparenting their children is likely to provide relevant clues for relations between parent characteristics and child characteristics and outcomes, perhaps more so than either parent provides independently (McHale, Kuersten-Hogan, Lauretti, & Rasmussen, 2000).

In general, future research might benefit from using broader measures of both maternal structure as well as personality. In the current study, the measure of structure was comprised mainly of gentle verbal control (and a lack of forceful physical/verbal control) and some reasoning (albeit not at all time points). A broader (and potentially more valuable) measure of structure should include a larger component of parental reasoning (i.e., giving children consequences of and feedback about their behavior), as well as an index of whether parents give their children clear, consistent guidelines, expectations, and rules and whether these are sensitive to the child's maturity and developmental level. The latter can be determined via parental report, but could also be gleaned from naturalistic observations in contexts where parents need to set limits for

their children (e.g., at a nature or water park, in a shopping center). By using a broader measure of structure, it may be possible to determine what (if any) aspects of structure are related to different dimensions of personality.

However, as discussed previously, parental structure is a complex construct and researchers have often struggled with how to define structure; as such, it is often difficult to hypothesize how parental structure may influence children's outcomes. Even though researchers have suggested that structure and control should be viewed as distinct and separate parenting dimensions (e.g., Grolnick & Pomerantz, 2009), Conger (2009) argued that structure/guidance still involves parental control. In examining aspects of structure/positive (gentle) control, it may be important for researchers to consider how this type of control might be conveyed to the child in a way that supports the development of competence and successful mastery of other developmental abilities (e.g., by considering the child's perspective when providing structure; Conger, 2009; Maccoby; 2007). For instance, parents could exhibit structure in a psychologically controlling/intrusive manner or in a way that supports the child's autonomy; in addition, structure might involve more or less involvement and/or warmth (Farkas, 2007; Pomerantz & Grolnick, 2009). Such variations suggest that there are different forms of structure that parents actually use when they are socializing their children and the type (i.e., form) of structure that parents use may depend on parental characteristics (e.g., personality) and may also differentially predict children's outcomes.

In addition, future research on personality dimensions should use a more expansive measure of personality that includes the facets of each dimension of personality. The current study assessed personality with a brief, 7-item questionnaire that

did not allow for analysis of facet-level relations. Particular facets of Agreeableness (e.g., altruism) and Conscientiousness (e.g., self-discipline) are likely to be driving relations, both directly and indirectly, to children's sympathetic and prosocial outcomes.

In the future, similar studies might find it useful to include negative parenting in addition to positive aspects of parenting. It would be interesting to determine whether doing so would show results consistent with the current study or if there would be differences, and perhaps even stronger relations, particularly in regard to relations between parenting and children's EC.

The results of this research should also be replicated with a dichotomous observed sympathy/prosocial behavior construct. Due to the low means for variables representing observed sympathy/prosocial behavior, it would be reasonable to create a dichotomous construct that consists of *any* indication of sympathy/prosocial behavior versus *no* indication of sympathy/prosocial behavior.

Future research is warranted on whether maternal warmth and sensitivity should be treated as indistinguishable constructs (as they were in the current study) or whether they should be examined individually. It is possible that by combining warmth and sensitivity the distinct predictive patterns of each are lost. However, there are inconsistencies in the literature, as researchers have examined these constructs both separately and combined (e.g., Davidov, 2003; Eisenberg et al., 2010; Spinrad et al., 2012). Davidov (2003) did find differential prediction from warmth and responsiveness to distress (perhaps a component of sensitivity) when examining these two constructs individually. A more important issue may be how researchers define warmth and sensitivity; warmth can be conceptualized as positive affect and affection expressed

toward the child and positive emotional tone while interacting with the child, whereas sensitivity has been conceptualized in a myriad of ways – as responsiveness to the child’s cues, the appropriateness of responses toward the child’s cues, behavior, and emotions, autonomy support, and general “supportiveness” (although sometimes “support” has been conceptualized as a combination of warmth and sensitivity). It is difficult to determine what aspects of warmth or sensitivity are responsible for relations and there are likely to be inconsistencies across similar studies when these constructs are defined in various ways. Warmth and sensitivity seem to be measuring different aspects of parenting, at least in the way they have been defined and measured across the literature; however, it is likely that these two constructs often co-occur and work in tandem to predict children’s outcomes. It may be difficult to disentangle warmth and sensitivity in order to examine “pure” measures of each and their distinct predictive patterns, particularly in regard to relations with children’s EC and sympathy/prosocial behavior.

As mentioned previously, researchers studying parenting must consider the dynamic interplay that likely occurs among parenting behaviors such as warmth, sensitivity, and structure. Because individual characteristics of parenting behavior do not exist or occur independently of other parenting characteristics, researchers should be aware that different dimensions of parental behavior are likely to interact to predict children’s outcomes. Moreover, although the current study examined the linear effects of maternal parenting behavior on children’s outcomes, some researchers have suggested that non-linear relations may also exist (although whether relations are linear or curvilinear may depend on what aspects of parenting and what types of outcomes are assessed; Gray & Steinberg, 1999). Additionally, it is possible that there are optimal or

maximum levels of parenting behaviors and that these levels differ among dimensions of parental behavior. Indeed, Baumrind (1991b) suggested that the impact of parental acceptance and control may “level off” after reaching these optimal points; that is, there may be some threshold of parenting behaviors after which point researchers no longer see strong effects on children’s outcomes. Although this may be true more generally, Gray and Steinberg (1999) suggested that the most beneficial level of an individual parenting dimension may depend on the specific outcome that is assessed. Therefore, researchers should be mindful of the interplay among parenting behaviors and the ways in which they potentially influence each other and interact to predict diverse outcomes in childhood.

As with many research endeavors, this investigation is not without its limitations. Although multiple time points were examined in the current study, the sample was still relatively young at all time points and the longitudinal nature of the study only covered a period of three years. Parenting is likely to change and develop over time, and children continue to develop cognitively, behaviorally, and emotionally throughout preschool and childhood; therefore, it would be of interest to continue to investigate the stability and change in parenting behaviors, as well as children’s regulatory abilities and sympathy/prosocial behavior, and the nature of the relations among these constructs across a longer developmental period. Additionally, another limitation was the relatively small sample size, especially when considering the complexity of the model that was tested in the current study. As with many longitudinal studies, the sample size decreased over time due to attrition. The sample used in the current study was also not very diverse; families included in this project tended to be Caucasian, middle-class (as reflected by household income), and parents tended to be somewhat educated (i.e., most parents had

college experience). It is likely that the results of the current study may not generalize to samples with more racial/ethnic and socioeconomic diversity.

Even with the aforementioned limitations, the current study had numerous strengths. The longitudinal nature of this study is one of its greatest strengths. Additionally, using both observed and reported measures for many of the constructs contributed to the strengths of the study. Multiple raters were utilized for the reported measures when they were available; as such, mothers and caregivers both provided information on children's regulation (i.e., EC) and mothers and fathers both provided information on children's prosocial behavior. Although future research in this area should be expanded longitudinally, another strength of the current study was the use of such young children in order to examine the emergence and development of children's regulation, sympathy, and prosocial behavior, while also being mindful of and examining mothers' parenting behaviors amid these burgeoning abilities.

The current study provides some support for the hypothesis that maternal Agreeableness may be related to mothers' positive parenting behaviors (i.e., warmth/sensitivity and structure), and that these positive parenting behaviors may be related in various ways to children's regulation and sympathy/prosocial behavior. Additionally, the results of this study suggest that mothers' Agreeableness may be directly related to their children's prosocial behavior, which provides a platform for future research to investigate possible mediators of this relation and whether the relation exists as children age. This study extends and connects prior research on the relations among parental personality and parenting behaviors, as well as research on parental personality and/or parenting behaviors and children's outcomes. By exploring these

constructs simultaneously, researchers are better able to delineate what processes may be instrumental in children's early development of regulation and sympathy/prosocial behavior. This work has implications for parents and practitioners who are interested in effecting change in children's regulation and sympathy/prosocial behavior. By examining precursors to children's abilities in these domains, researchers can provide parents and practitioners with empirical evidence on how parental behaviors may impact children's development.

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APPENDIX A  
TABLES AND FIGURES

Table 1

## Means and Standard Deviations of Study Variables

	T1	T2	T3	T4
<u>Maternal Personality</u>				
Agreeableness	4.15 (.58)	--	--	--
Conscientiousness	3.89 (.62)	--	--	--
<u>Maternal Warmth</u>				
Teaching – Warmth	3.47 (.52)	3.50 (.47)	2.96 (.33)	--
Teaching – Maternal Positive Affect	1.31 (.21)	1.23 (.20)	1.12 (.15)	--
Free Play – Maternal Positive Affect	2.23 (.61)	1.85 (.54)	1.76 (.50)	--
<u>Maternal Sensitivity</u>				
Teaching	3.59 (.47)	3.77 (.36)	2.91 (.51)	--
Free Play	2.52 (.61)	2.83 (.52)	3.26 (.53)	--
<u>Maternal Structure</u>				
Prohibition Toys	.39 (.27)	.64 (.33)	.41 (.32)	--
Free Play Clean Up	.79 (.30)	.89 (.19)	.72 (.30)	--
Reported Reasoning	4.85 (1.87)	5.31 (1.64)	5.60 (1.52)	--
<u>Effortful Control</u>				
Mother-reported	3.90 (.62)	4.28 (.64)	4.34 (.57)	4.57 (.60)
Caregiver-reported	4.40 (.79)	4.71 (.77)	4.61 (.67)	4.64 (.70)
Dinky Toys – Overall Restraint	--	2.29 (.63)	2.44 (1.05)	3.55 (.80)
Rabbit & Turtle – Mean Curve Score	--	2.55 (3.00)	10.02 (3.53)	10.65 (2.20)
Waiting for Bow – Latency Score	--	1.30 (.59)	1.50 (.50)	1.77 (.29)
<u>Sympathy</u>				
Experimenter Hurt – Hypothesis Testing	1.23 (.32)	1.29 (.38)	1.15 (.26)	1.06 (.17)
<u>Prosocial Behavior</u>				
Mother-reported	1.17 (.59)	1.41 (.49)	1.50 (.489)	1.41 (.50)
Father-reported	1.05 (.58)	1.38 (.53)	1.45 (.54)	1.43 (.53)
Experimenter Hurt – Prosocial Behavior	1.02 (.10)	1.02 (.13)	1.02 (.12)	1.02 (.16)
Experimenter Hurt – Prosocial Verbalizations	--	1.07 (.23)	1.04 (.11)	1.12 (.30)

*Note.* Standard deviations are presented in parentheses

Table 2

## Correlations Among Measures of Maternal Warmth

	T1			T2			T3		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
T1									
1. Free Play positive affect	--	.42**	.32**	.28**	.43**	.22**	.22**	.10	.21**
2. Teaching warmth		--	.53**	.24**	.50**	.29**	.19**	.34**	.22**
3. Teaching positive affect			--	.27**	.24**	.30**	.22**	.16*	.15*
T2									
1. Free Play positive affect	--	--	--	--	.36**	.39**	.42**	.13 <sup>+</sup>	.32**
2. Teaching warmth		--	--	--	--	.55**	.25**	.17*	.17*
3. Teaching positive affect			--	--	--	--	.29**	.01	.12 <sup>+</sup>
T3									
1. Free Play positive affect	--	--	--	--	--	--	--	.17*	.34**
2. Teaching warmth		--	--	--	--	--	--	--	.43**
3. Teaching positive affect			--	--	--	--	--	--	--

Note. \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .10$

Table 3

## Correlations Among Measures of Maternal Sensitivity

	T1		T2		T3	
	(1)	(2)	(1)	(2)	(1)	(2)
T1						
1. Free Play sensitivity	--	.18**	.42**	.17*	.42**	.35**
2. Teaching sensitivity		--	.29**	.47**	.31**	.34**
T2						
1. Free Play sensitivity	--	--	--	.27**	.37**	.36**
2. Teaching sensitivity		--	--	--	.26**	.25**
T3						
1. Free Play sensitivity	--	--	--	--	--	.29**
2. Teaching sensitivity		--	--	--	--	--

Note. \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .10$

Table 4

## Correlations Among Measures of Maternal Structure

	T1			T2			T3		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
T1									
1. Free Play	--	.29**	.20**	.48**	.28**	.27**	.17*	-.04	.13 <sup>+</sup>
2. Prohibition Toys		--	.17**	.19**	.30**	.13 <sup>+</sup>	.12 <sup>+</sup>	.14 <sup>+</sup>	.07
3. Mother-reported reasoning			--	.04	-.03	.49**	-.03	-.06	.37**
T2									
1. Free Play	--	--	--	--	.27**	.15*	.30**	.08	.03
2. Prohibition Toys		--	--	--	--	.13 <sup>+</sup>	.30**	.13 <sup>+</sup>	.08
3. Mother-reported reasoning			--	--	--	--	.09	-.004	.66**
T3									
1. Free Play	--	--	--	--	--	--	--	.29**	.03
2. Prohibition Toys		--	--	--	--	--	--	--	-.03
3. Mother-reported reasoning			--	--	--	--	--	--	--

Notes. \*\*  $p < .01$ ; \*  $p < .05$ ; <sup>+</sup>  $p < .10$

Table 5

## Across-Time/Across-Reporter Correlations Among Measures of Effortful Control

	T3					
	Mother			Caregiver		
	(1)	(2)	(3)	(1)	(2)	(3)
T2 Mother-Reported						
1. Attention Focusing	--	--	--	.10	-.01	.09
2. Attention Shifting	--	--	--	.11	.11	.19*
3. Inhibitory Control	--	--	--	.20*	.17*	.30**
T2 Caregiver-Reported						
1. Attention Focusing	-.05	-.21*	.07	--	--	--
2. Attention Shifting	.08	-.06	.15 <sup>+</sup>	--	--	--
3. Inhibitory Control	.26**	.10	.40**	--	--	--

Notes. \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .10$

Table 6

## Across-Time/Across-Reporter Correlations Among Measures of Effortful Control

	T4					
	Mother			Caregiver		
	(1)	(2)	(3)	(1)	(2)	(3)
T2 Mother-Reported						
1. Attention Focusing	--	--	--	.08	-.06	.08
2. Attention Shifting	--	--	--	.06	.22*	.15 <sup>+</sup>
3. Inhibitory Control	--	--	--	.15 <sup>+</sup>	.25**	.38**
T2 Caregiver-Reported						
1. Attention Focusing	-.10	.001	-.04	--	--	--
2. Attention Shifting	.15 <sup>+</sup>	.08	.18 <sup>+</sup>	--	--	--
3. Inhibitory Control	.27**	.19*	.36**	--	--	--

Notes. \*\*  $p < .01$ ; \*  $p < .05$ ; +  $p < .10$

Table 7

## Across-Time/Across-Reporter Correlations Among Measures of Effortful Control

	T4					
	Mother			Caregiver		
	(1)	(2)	(3)	(1)	(2)	(3)
T3 Mother-Reported						
1. Attention Focusing	--	--	--	.21*	.09	.28**
2. Attention Shifting	--	--	--	-.02	.18*	.16 <sup>+</sup>
3. Inhibitory Control	--	--	--	.14 <sup>+</sup>	.21*	.42**
T3 Caregiver-Reported						
1. Attention Focusing	.19*	.07	.20*	--	--	--
2. Attention Shifting	.06	.17 <sup>+</sup>	.20*	--	--	--
3. Inhibitory Control	.21*	.20*	.39**	--	--	--

Notes. \*\*  $p < .01$ ; \*  $p < .05$ ; <sup>+</sup>  $p < .10$

Table 8

## Correlations Among Measures of Children's Effortful Control

	T2				T3				T4			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
T1												
1. Adult-reported EC	--	.12	.12 <sup>+</sup>	.30 <sup>**</sup>	.63 <sup>**</sup>	.12 <sup>+</sup>	.08	.22 <sup>**</sup>	.55 <sup>**</sup>	.13 <sup>+</sup>	.09	.07
2. Rabbit/Turtle EC	--	--	.12 <sup>+</sup>	.22 <sup>**</sup>	.07	.24 <sup>**</sup>	.11	.06	.11	.09	.05	-.02
3. Dinky Toys EC	--	--	--	.28 <sup>**</sup>	.19 <sup>**</sup>	.13 <sup>+</sup>	.15 <sup>*</sup>	.17 <sup>*</sup>	.09	.15 <sup>+</sup>	-.05	.14 <sup>+</sup>
4. Waiting for Gift Bow EC	--	--	--	--	.31 <sup>**</sup>	.21 <sup>**</sup>	.27 <sup>**</sup>	.42 <sup>**</sup>	.25 <sup>**</sup>	.16 <sup>*</sup>	.15 <sup>*</sup>	.20 <sup>**</sup>
T2												
1. Adult-reported EC	--	--	--	--	--	.16 <sup>*</sup>	.13 <sup>+</sup>	.34 <sup>**</sup>	.66 <sup>**</sup>	.15 <sup>+</sup>	.11	.16 <sup>*</sup>
2. Rabbit/Turtle EC	--	--	--	--	--	--	.32 <sup>**</sup>	.46 <sup>**</sup>	.28 <sup>**</sup>	.21 <sup>**</sup>	.24 <sup>**</sup>	.11
3. Dinky Toys EC	--	--	--	--	--	--	--	.37 <sup>**</sup>	.20 <sup>*</sup>	.10	.26 <sup>**</sup>	.15 <sup>+</sup>
4. Waiting for Gift Bow EC	--	--	--	--	--	--	--	--	.32 <sup>**</sup>	.18 <sup>*</sup>	.23 <sup>**</sup>	.36 <sup>**</sup>
T3												
1. Adult-reported EC	--	--	--	--	--	--	--	--	--	.21 <sup>**</sup>	.26 <sup>**</sup>	.21 <sup>**</sup>
2. Rabbit/Turtle EC	--	--	--	--	--	--	--	--	--	--	.18 <sup>*</sup>	.21 <sup>**</sup>
3. Dinky Toys EC	--	--	--	--	--	--	--	--	--	--	--	.25 <sup>**</sup>
4. Waiting for Gift Bow EC	--	--	--	--	--	--	--	--	--	--	--	--

Note. <sup>\*\*</sup>  $p < .01$ ; <sup>\*</sup>  $p < .05$ ; <sup>+</sup>  $p < .10$ .

Table 9

## Correlations Among Measures of Children's Observed Sympathy/Prosocial Behavior

	T2			T3			T4		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
T2									
1. E Hurt: Hypothesis Testing	--	.004	.27**	.25**	.06	.29**	-.03	.26**	.08
2. E Hurt: Direct Prosocial Behavior		--	.04	-.04	-.03	.12 <sup>+</sup>	-.05	.001	-.05
3. E Hurt: Prosocial Verbalizations			--	.17*	-.03	.37**	-.04	-.01	.14 <sup>+</sup>
T3									
1. E Hurt: Hypothesis Testing	--	--	--	--	.19**	.14 <sup>+</sup>	.12	.17*	.16*
2. E Hurt: Direct Prosocial Behavior		--	--	--	--	.18*	.22**	.30**	.24**
3. E Hurt: Prosocial Verbalizations			--	--	--	--	.03	.11	.20**
T4									
1. E Hurt: Hypothesis Testing	--	--	--	--	--	--	--	-.04	.26**
2. E Hurt: Direct Prosocial Behavior		--	--	--	--	--	--	--	.32**
3. E Hurt: Prosocial Verbalizations			--	--	--	--	--	--	--

Notes. \*\*  $p < .01$ ; \*  $p < .05$ ; <sup>+</sup>  $p < .10$

Table 10

## Correlations Among Measures of Children's Reported Prosocial Behavior

	T2		T3		T4	
	(1)	(2)	(1)	(2)	(1)	(2)
T2						
1. Mother-reported	--	.37**	.51**	.32**	.55**	.20*
2. Father-reported		--	.32**	.46**	.29**	.54**
T3						
1. Mother-reported	--	--	--	.33**	.59**	.34**
2. Father-reported		--	--	--	.17 <sup>+</sup>	.46**
T4						
1. Mother-reported	--	--	--	--	--	.26**
2. Father-reported		--	--	--	--	--

Note. \*\*  $p < .01$ ; \*  $p < .05$ ; <sup>+</sup>  $p < .10$

Table 11

The Relations of Time 1 Maternal Personality Measures

	(1)	(2)
1. Agreeableness	--	.21**
2. Conscientiousness	--	--

*Note.* \*\* $p < .01$

Table 12

Correlations Among T1 Measures of Warmth and Sensitivity

T1	(1)	(2)	(3)	(4)	(5)
1. Free Play: positive affect	--	.42**	.32**	.47**	.07
2. Teaching: warmth	--	--	.53**	.28**	.42**
3. Teaching: positive affect	--	--	--	.06	.17**
4. Free Play: sensitivity	--	--	--	--	.18**
5. Teaching: sensitivity	--	--	--	--	--

Note. \*\*  $p < .01$

Table 13

Correlations Among T2 Measures of Warmth and Sensitivity

T2	(1)	(2)	(3)	(4)	(5)
1. Free Play: positive affect	--	.36**	.39**	.35**	.04
2. Teaching: warmth	--	--	.55**	.35**	.46**
3. Teaching: positive affect	--	--	--	.18**	.14*
4. Free Play: sensitivity	--	--	--	--	.27**
5. Teaching: sensitivity	--	--	--	--	--

Note. \*\*  $p < .01$ ; \*  $p < .05$

Table 14

Correlations Among T3 Measures of Warmth and Sensitivity

T3	(1)	(2)	(3)	(4)	(5)
1. Free Play: positive affect	--	.17*	.34**	.20**	.16*
2. Teaching: warmth	--	--	.43**	.20**	.63**
3. Teaching: positive affect	--	--	--	.08	.29**
4. Free Play: sensitivity	--	--	--	--	.29**
5. Teaching: sensitivity	--	--	--	--	--

Note. \*\*  $p < .01$ ; \*  $p < .05$

Table 15

## Correlations Among Main Composite Measures

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. T1 Agr	.21**	.14*	.13 <sup>+</sup>	-.02	-.09	.03	.01	-.09	.03	.04	.04	.04	.13	.14*	.10	.07
2. T1 Con	--	.17**	.06	.09	.06	.12 <sup>+</sup>	.09	.08	.10	.05	.06	-.07	.01	.14*	.07	.09
3. T1 W/S	--	.56**	.56**	.49**	.29**	.26**	.11	.30**	.27**	.07	.01	.13 <sup>+</sup>	.07	.02	.02	.07
4. T2 W/S	--	--	--	.44**	.20**	.16*	.17*	.18**	.22**	.16*	.01	.07	.01	.06	.06	.08
5. T3 W/S	--	--	--	--	.33**	.29**	.22**	.25**	.27**	.02	.12	.09	.14 <sup>+</sup>	-.03	.01	.10
6. T1 Str	--	--	--	--	--	.49**	.40**	.25**	.02	.02	.05	.11	.15 <sup>+</sup>	.07	.11	.01
7. T2 Str	--	--	--	--	--	--	.71**	.38**	.01	-.02	.01	.07	.02	.17*	.17*	.14 <sup>+</sup>
8. T3 Str	--	--	--	--	--	--	--	.30**	.01	-.08	-.06	.02	-.07	.08	.03	.15*
9. T2 EC	--	--	--	--	--	--	--	--	.27**	.15*	-.03	-.07	-.03	.03	-.03	.11
10. T3 EC	--	--	--	--	--	--	--	--	--	.33**	.02	.02	-.09	-.01	.06	.11
M1. T4 EC	--	--	--	--	--	--	--	--	--	--	-.02	.02	-.03	.06	.15*	.08
O <sub>t</sub> 12. T2 S/PB-O	--	--	--	--	--	--	--	--	--	--	--	.33**	.13 <sup>+</sup>	.11	.23**	.19*
e 13. T3 S/PB-O	--	--	--	--	--	--	--	--	--	--	--	--	.33**	-.02	.12	.13
S 14. T4 S/PB-O	--	--	--	--	--	--	--	--	--	--	--	--	--	.05	.06	.18*
* 15. T2 PB-R	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.56**	.56**
* 16. T3 PB-R	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.56**
* 17. T4 PB-R	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes. \*\* =  $p < .01$ ; \* =  $p < .05$ ; + =  $p < .10$ ; Agr = Agreeableness, Con = Conscientiousness, W/S = Warmth/Sensitivity, Str = Structure, EC = Effortful Control, S/PB-O = Observed Sympathy/Prosocial Behavior, PB-R = Reported Prosocial Behavior.

Table 16

Relations Among Constructs Within Time – Full Hypothesized Path Model

		T1					
		CON	W/S	STR	EC	S/PB-O	PB-R
AGR		<b>.36 (.002)</b>	<b>.26 (.047)</b>	.20 (.05)			
		<b>.14 (.04)</b>	.08 (.13)	.15 (.11)			
CON			<b>.28 (.01)</b>	<b>.26 (.003)</b>			
			<b>.09 (.04)</b>	<b>.21 (.01)</b>			
W/S				<b>.40 (&lt; .001)</b>			
				<b>.26 (&lt; .001)</b>			
		T2					
W/S				<b>.15 (.046)</b>	.11 (.11)	.03 (.64)	.10 (.14)
				<i>.06 (.06)</i>	.08 (.13)	.002 (.64)	.02 (.15)
STR					<b>.18 (.01)</b>	.05 (.46)	.09 (.26)
					<b>.31 (.01)</b>	.01 (.47)	.03 (.26)
EC						-.02 (.74)	.06 (.43)
						-.01 (.74)	.04 (.43)
S/PB-O							<b>.17 (.01)</b>
							<b>.01 (.02)</b>

	T3		
W/S	.02 (.78)	<b>.26 (&lt; .001)</b>	.17 (.17)
	.001 (.78)	<b>.13 (.002)</b>	.01 (.25)
STR		<i>.15 (.06)</i>	-.09 (.22)
		<i>.08 (.07)</i>	-.003 (.25)
EC			.03 (.68)
			.01 (.68)
S/PB-O			.08 (.28)
			.003 (.28)
	T4		
EC			.08 (.39)
			.02 (.39)
S/PB-O			.11 (.14)
			.004 (.14)

*Note.* Fully standardized estimates (correlations) are presented first, unstandardized estimates (covariances) are presented underneath; *p*-values for estimates are presented in parentheses. Estimates reflect the standardized correlations or unstandardized covariances among the *disturbances* of the constructs. Significant estimates are presented in bold; marginal estimates are presented in italics. AGR = Agreeableness; CON = Conscientiousness; W/S = Warmth/Sensitivity; STR = Structure; EC = Effortful Control; S/PB-O = Observed Sympathy/Prosocial Behavior; PB-R = Reported Prosocial Behavior.

Table 17

## Estimates for Paths Across Time – Full Hypothesized Path Model

	T2					T3				
	W/S	STR	EC	S/PB-O	PB-R					
T1										
AGR →	.12 (.07)	<b>.16 (.02)</b>			<b>.25 (.02)</b>					
CON →	-.07 (.25)	-.04 (.95)			<b>.17 (.01)</b>					
W/S →	<b>.57 (&lt;.001)</b>	<b>.22 (.004)</b>	<b>.40 (&lt;.001)</b>	.07 (.46)	.05 (.62)					
STR →	<b>.53 (&lt;.001)</b>	<b>.49 (.004)</b>	<b>1.45 (&lt;.001)</b>	.02 (.45)	.04 (.62)					
		<b>.37 (&lt;.001)</b>		.06 (.38)	.02 (.78)					
		<b>.34 (&lt;.001)</b>		.01 (.39)	.01 (.79)					
T1										
W/S →	<b>.29 (&lt;.001)</b>									
	<b>.17 (&lt;.001)</b>									
STR →	<b>.31 (&lt;.001)</b>									
	<b>.08 (&lt;.001)</b>									
T2										
W/S →	<b>.23 (.01)</b>		<b>.20 (.02)</b>	.15 (.17)	.04 (.55)					
	<b>.15 (.02)</b>		<b>.99 (.01)</b>	.04 (.21)	.03 (.55)					
STR →		<b>.25 (&lt;.001)</b>		<b>.18 (.01)</b>	.05 (.47)					
		<b>.05 (.001)</b>		<b>.02 (.03)</b>	.02 (.47)					
EC →			<b>.38 (&lt;.001)</b>	-.06 (.48)	.03 (.61)					
			<b>.49 (&lt;.001)</b>	-.004 (.47)	.01 (.61)					



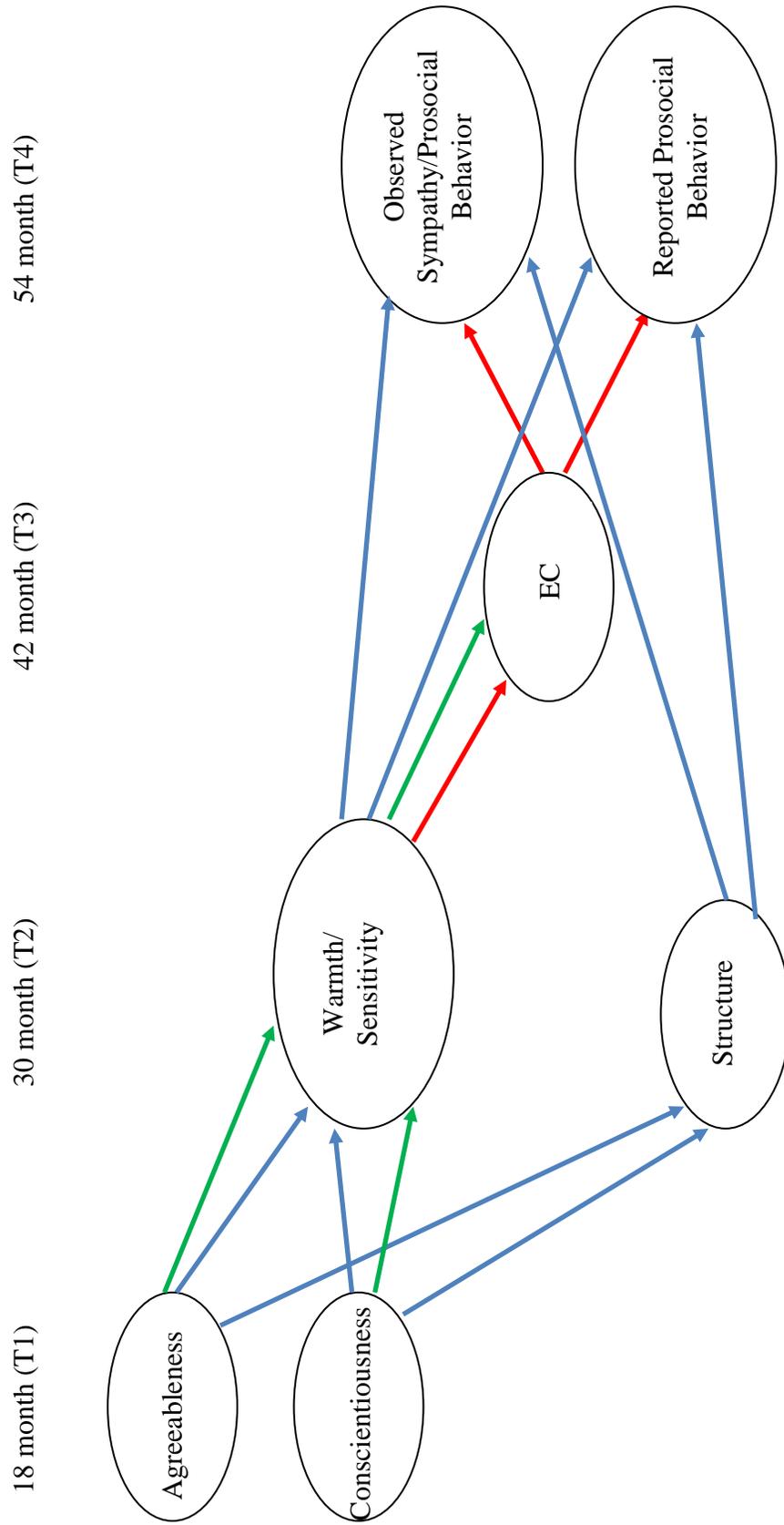


Figure 1. Hypothesized model of relations among constructs (without autoregressive paths). All paths are hypothesized to be positive. Blue lines represent the hypothesized mediation by parenting behaviors of the relation between personality and children's outcomes. Red lines represent the hypothesized mediation by EC of the relation between parenting behaviors and sympathy and/or prosocial behavior. Green lines represent the hypothesized mediation by warmth/sensitivity of the relation between personality and EC.

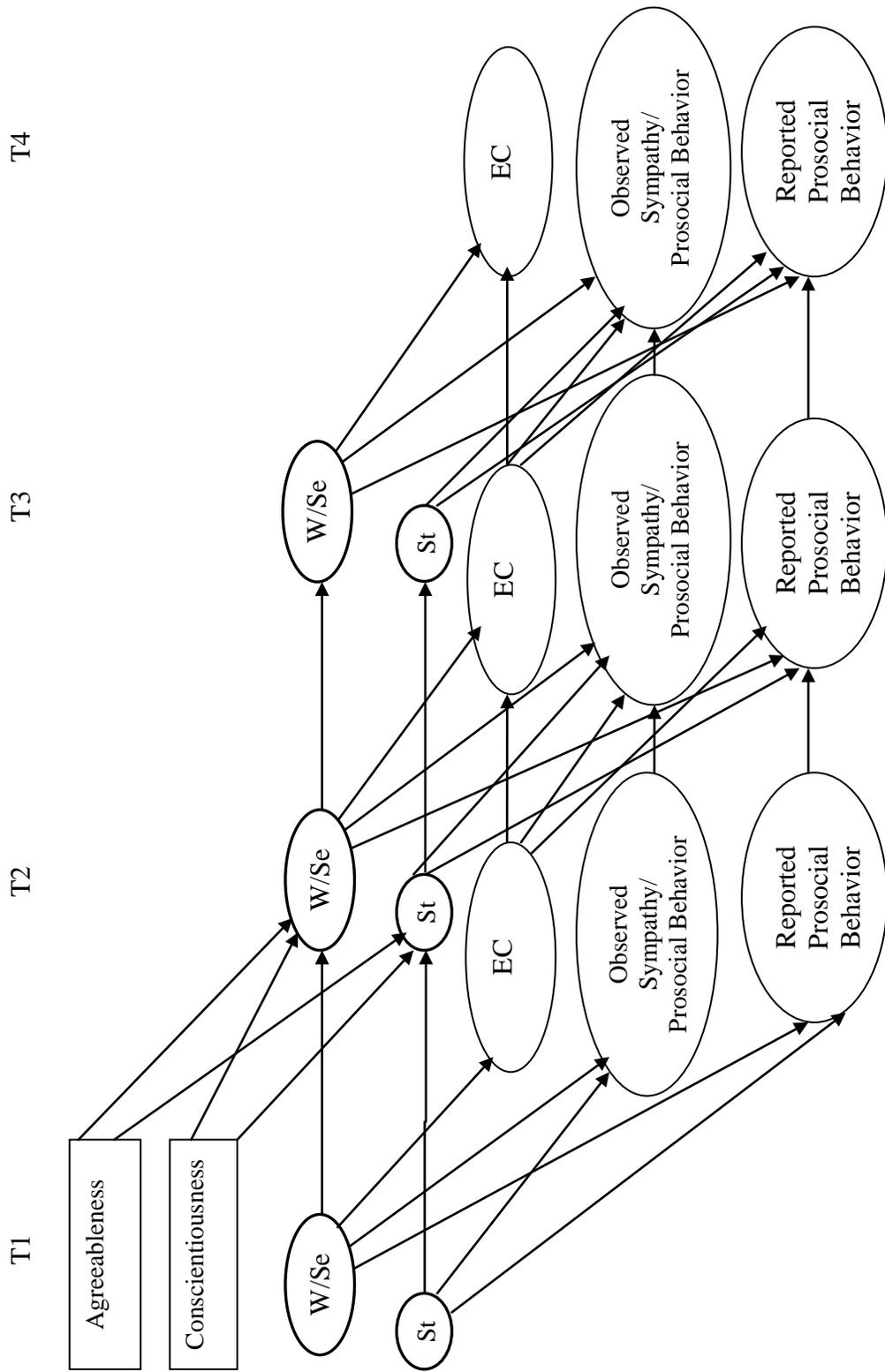


Figure 2. Hypothesized model of relations among constructs (with autoregressive paths). W = warmth, Se = sensitivity, and St = Structure. Rectangles indicate measured/manifest variables, ovals represent latent constructs. All constructs will be correlated within time.

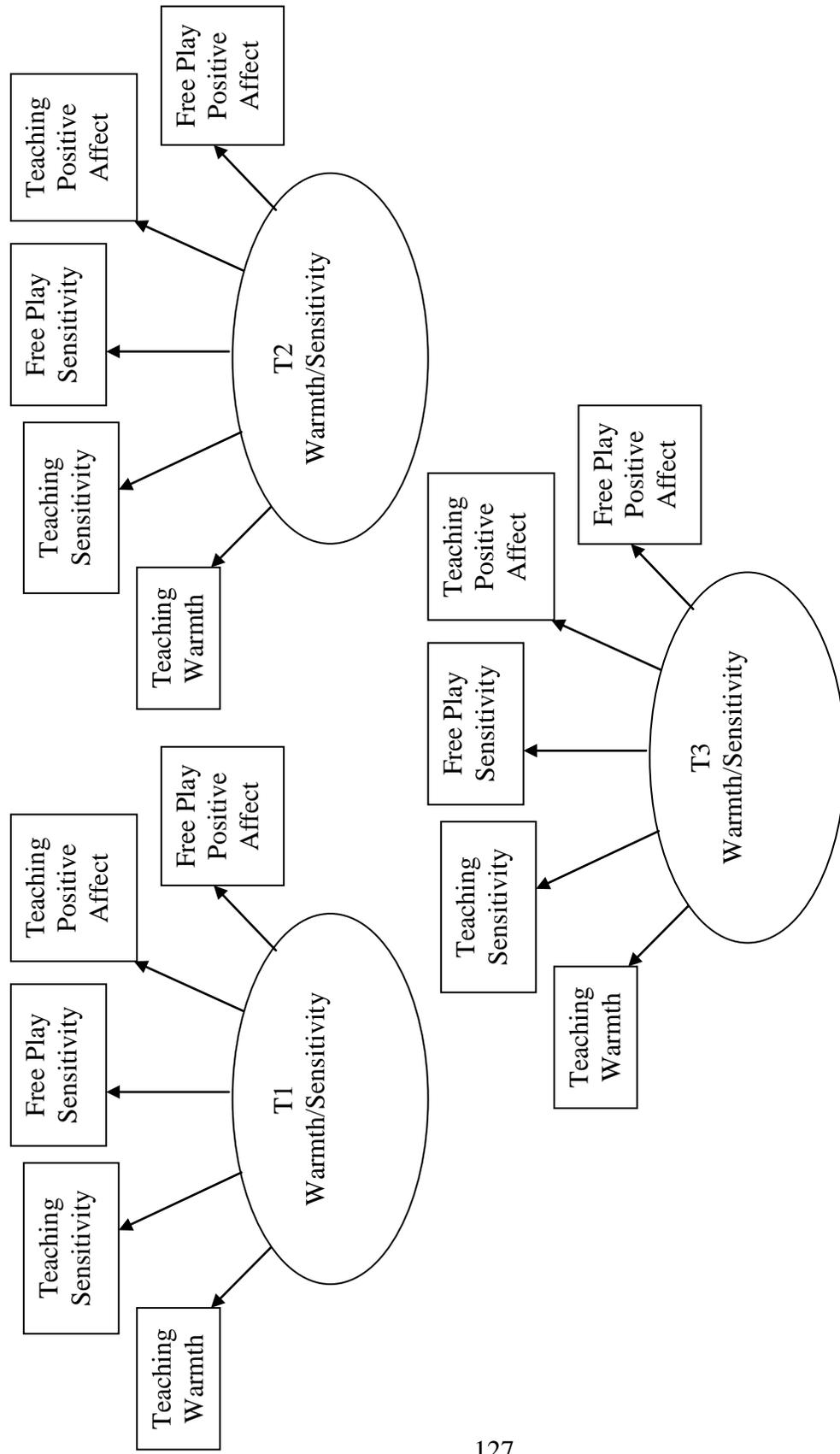


Figure 3. Indicators of T1, T2, and T3 Warmth.

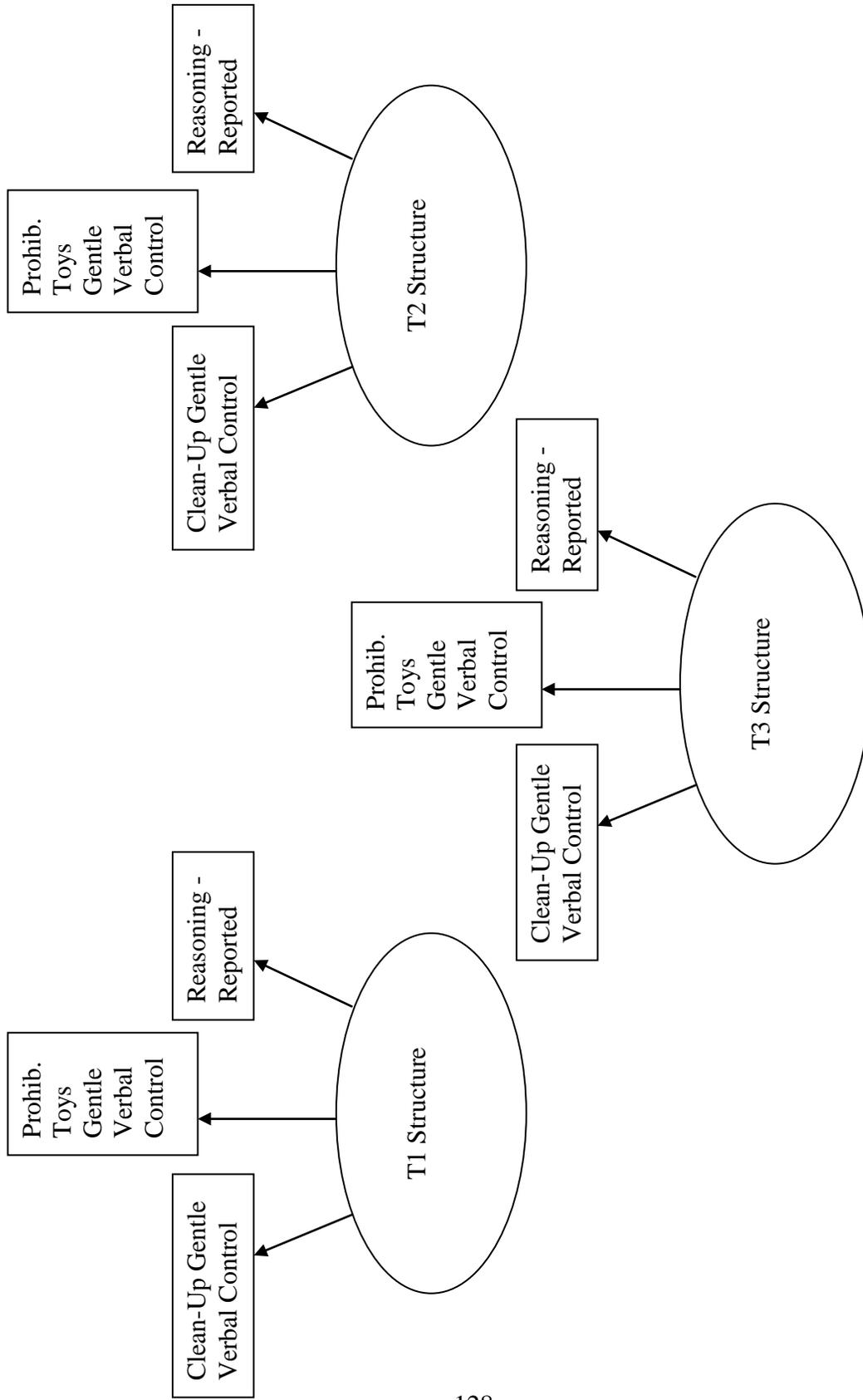


Figure 4. Indicators of T1, T2, and T3 Structure.

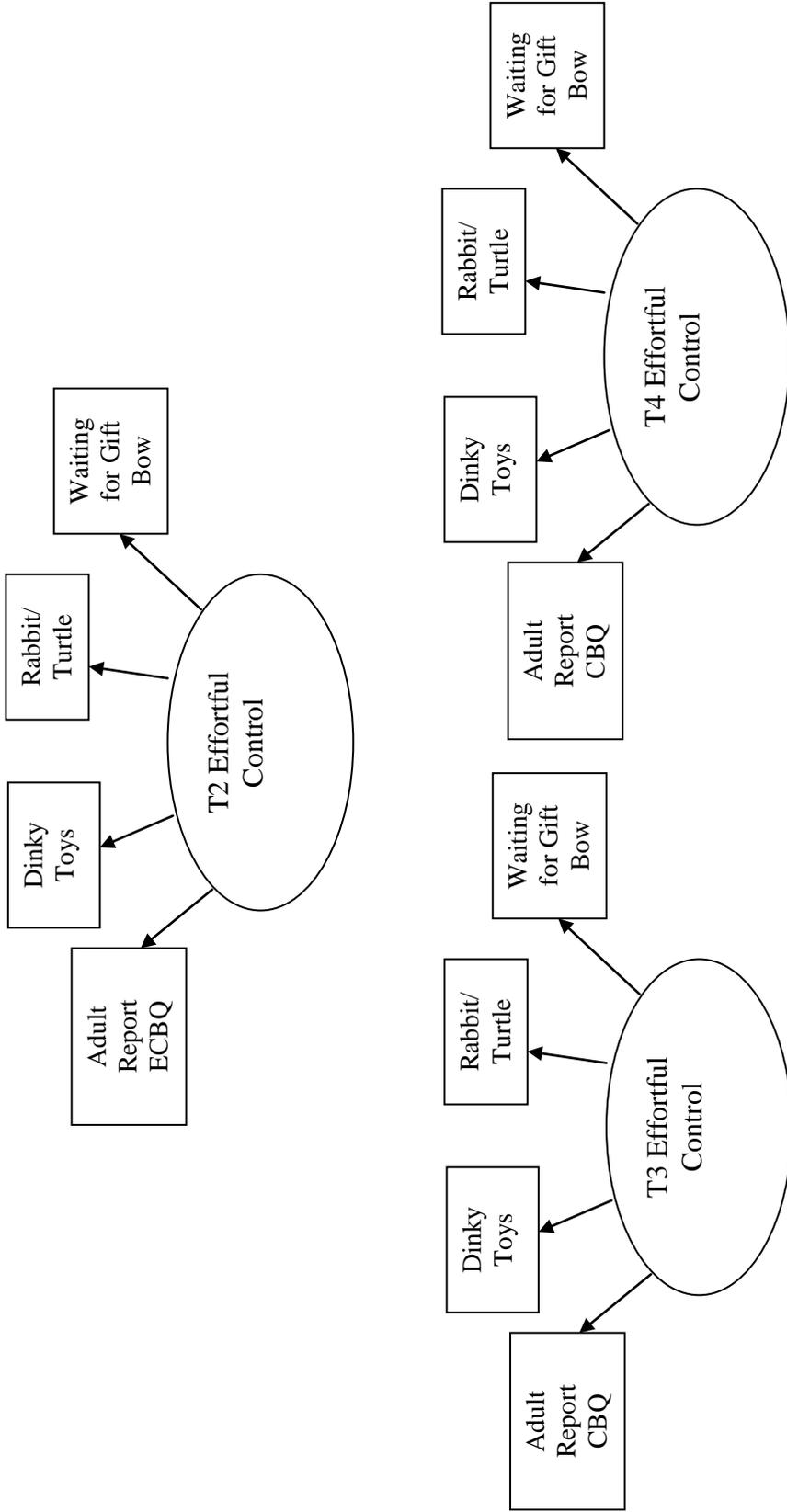


Figure 5. Indicators of T2, T3, and T4 EC.

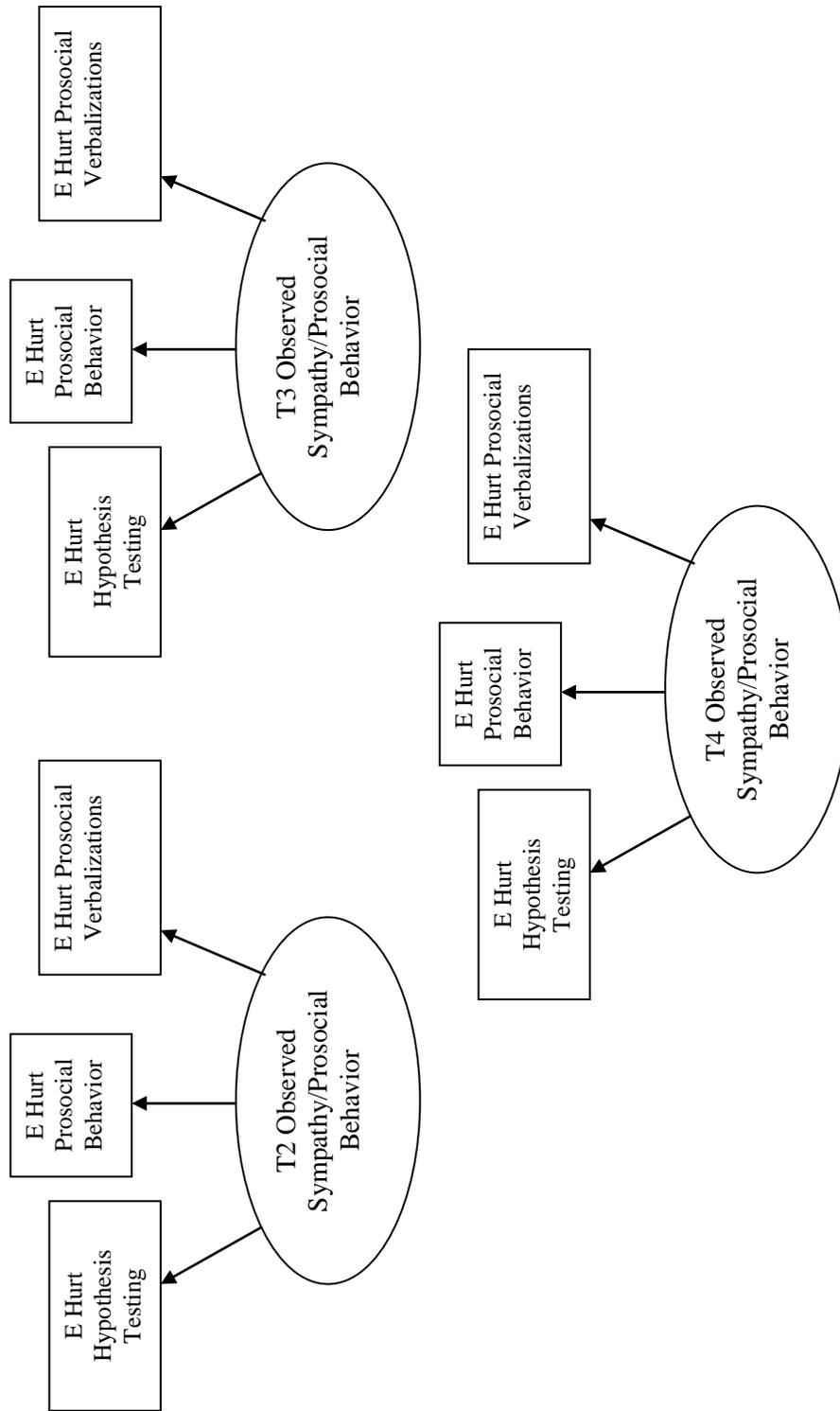


Figure 6. Indicators of T2, T3, and T4 Observed Sympathy/Prosocial Behavior.

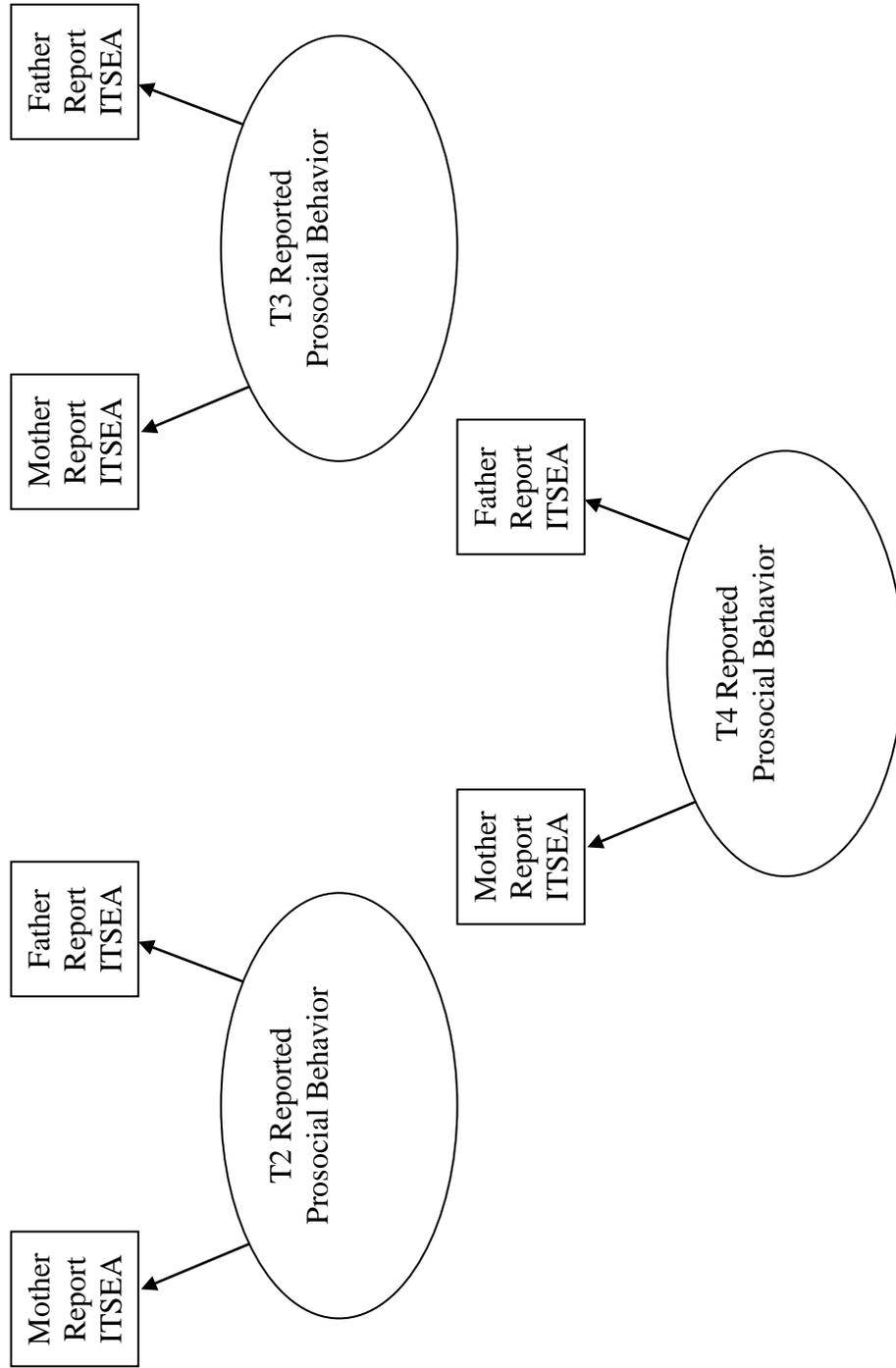


Figure 7. Indicators of T2, T3, and T4 Reported Prosocial Behavior.

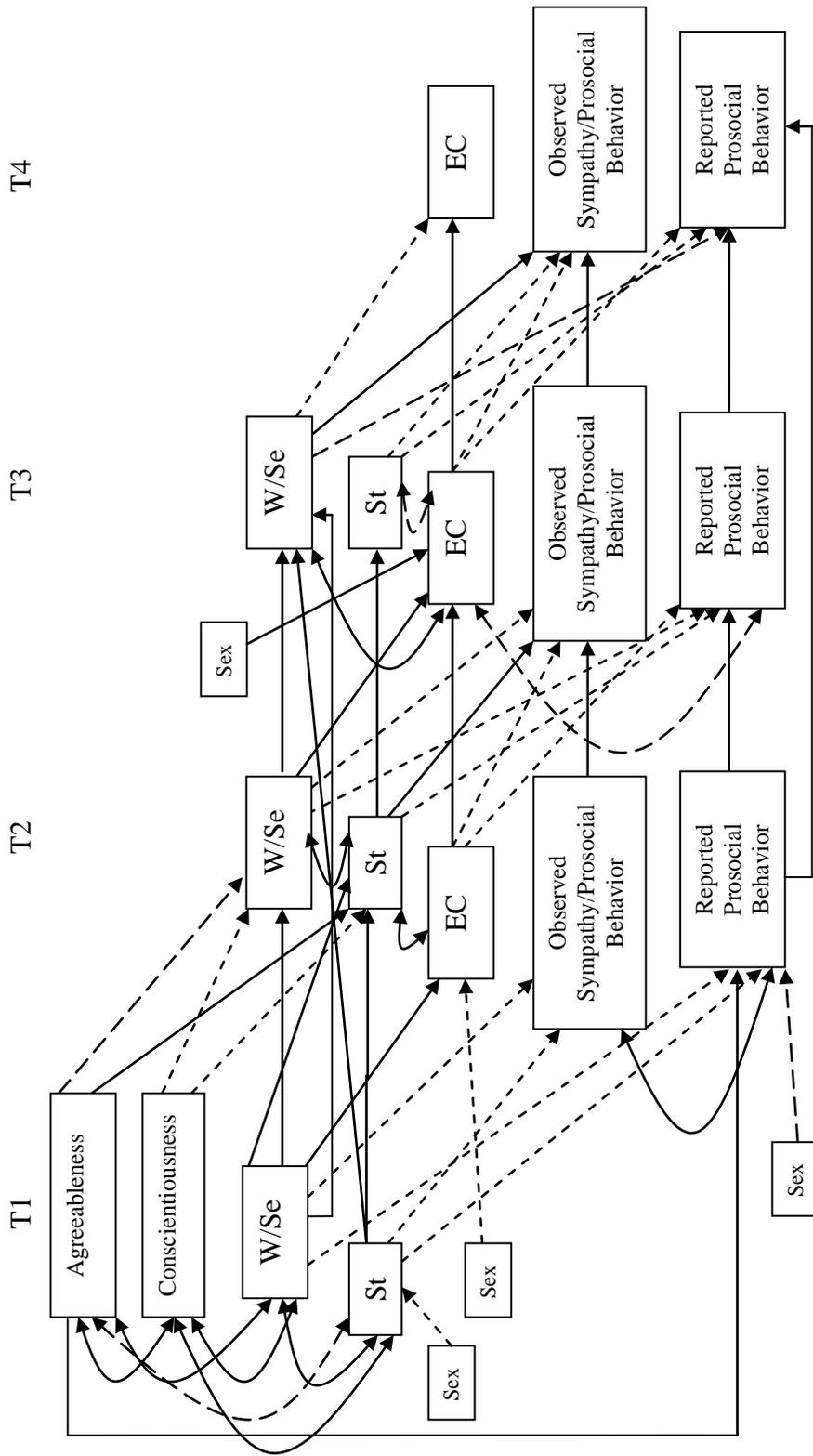


Figure 8. Full hypothesized model with manifest variables. W/Se = warmth/sensitivity and St = Structure. Solid lines represent significant paths, long dashed lines represent marginal paths, and short dashed lines represent non-significant paths. Curved lines represent correlations among constructs; only significant and marginal correlations between constructs are presented. Estimates and  $p$ -values used for the paths and correlations are based on fully standardized results.

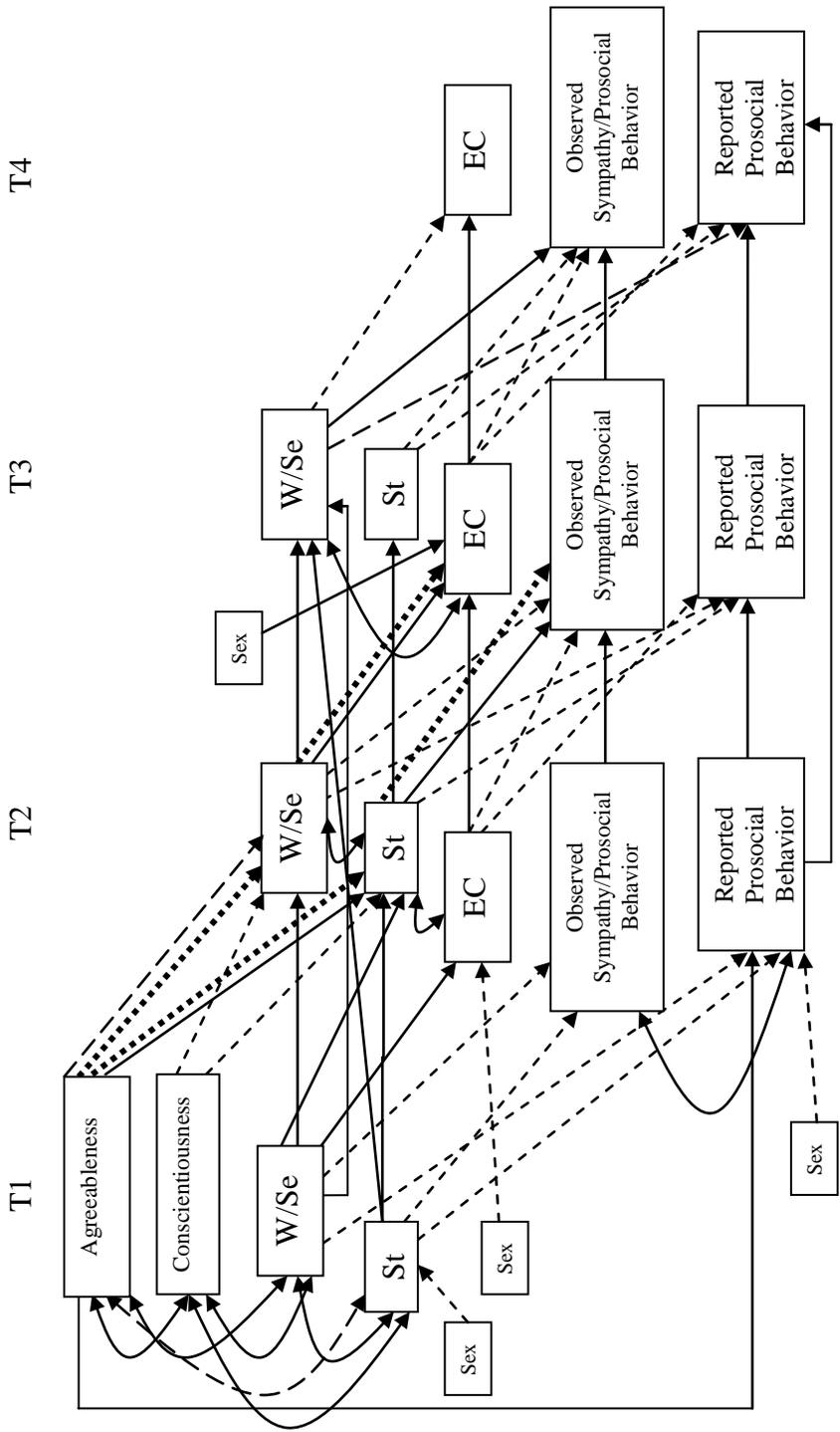


Figure 9. Full hypothesized model with mediation. W/Se = warmth/sensitivity and St = Structure. Solid lines represent significant paths, long dashed lines represent marginal paths, and short dashed lines represent non-significant paths. Bold, dotted lines represent the non-significant indirect mediated effects. Curved lines represent correlations among constructs; only significant and marginal correlations between constructs are presented. Estimates and *p*-values used for the paths and correlations are based on fully standardized results.

APPENDIX B  
REPORTED MEASURES

***Maternal Personality: Big Five Personality Inventory***

Disagree strongly	Disagree a little	Neither agree or disagree	Agree a little	Agree strongly
1	2	3	4	5

---

Do you feel that you are someone who:

**Agreeableness**

1. tends to find fault with others. REVERSED
2. is considerate and kind to almost everyone.
3. can be cold and aloof. REVERSED
4. likes to cooperate with others.
5. is sometimes rude to others. REVERSED
6. is generally trusting
7. has a forgiving nature

**Conscientiousness**

1. is a reliable worker.
2. can be somewhat careless. REVERSED
3. does things efficiently.
4. tends to be disorganized. REVERSED
5. does a thorough job.
6. is lazy at times. REVERSED
7. is easily distracted. REVERSED

*Maternal Warmth: Parental Attitudes toward Childrearing*

Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
1	2	3	4	5	6

---

**Warmth**

1. I feel a child should be given comfort and understanding when s/he is scared or upset.
2. I express affection by hugging, kissing, and holding my child.
3. I find some of my greatest satisfaction in my child.
4. I am easy-going and relaxed with my child.
5. I joke and play with my child.
6. I feel that my child and I have warm, intimate times together.
7. I believe in praising a child when s/he is good and think it gets better results than punishing when s/he is bad.
8. I make sure my child knows that I appreciate what s/he tries or accomplishes.
9. I make sure I know where my child is and what s/he is doing.

*Maternal Structure: Parental Responses to Child Misbehavior*

Never	Less than once/week	1-2 times/week	3-4 times/week	5-6 times/week	7-8 times/week	9+ times/ week
1	2	3	4	5	6	7

We are interested in learning the types of responses parents use in reaction to common child misbehaviors. Please indicate how frequently you use each of the following responses **in an average week**.

1. Reason—such as explain about rules or consequences of misbehavior

**Children’s EC: ECBQ Attentional Focusing**

As you read each description of your child’s behavior below, please indicate how often your child did this during the **LAST WEEK** (the past seven days) by filling in the corresponding bubble to the right of the statement. The “Does Not Apply” column is used when you did not see your child in the situation described during the last week. For example, if the situation mentions your child playing outdoors and there was no time during the last week when your child played outdoors, mark the bubble in the last column.

Never	Very Rarely	Less than Half the Time	About Half the Time	More Than Half the Time	Almost Always	Always	Does Not Apply
1	2	3	4	5	6	7	NA

When engaged in play with his/her favorite toy, how often did your child:

1. play for 5 minutes or less? REVERSED
2. play for more than 10 minutes?

When engaged in an activity requiring attention, such as building with blocks, how often did your child:

3. move quickly to another activity? REVERSED
4. stay involved for 10 minutes or more?
5. tire of the activity relatively quickly? REVERSED

When playing alone, how often did your child:

6. become easily distracted? REVERSED
7. play with a set of objects for 5 minutes or longer at a time?
8. move from one task or activity to another without completing any?  
REVERSED
9. have trouble focusing on a task without help? REVERSED

While looking at picture books on his/her own, how often did your child:

10. stay interested in the book for 5 minutes or less? REVERSED
11. stay interested in the book for more than 10 minutes at a time?
12. become easily distracted? REVERSED

**Children’s EC: ECBQ Attentional Shifting**

As you read each description of your child’s behavior below, please indicate how often your child did this during the **LAST WEEK** (the past seven days) by filling in the corresponding bubble to the right of the statement. The “Does Not Apply” column is used when you did not see your child in the situation described during the last week. For example, if the situation mentions your child playing outdoors and there was no time during the last week when your child played outdoors, mark the bubble in the last column.

Never	Very Rarely	Less than Half the Time	About Half the Time	More Than Half the Time	Almost Always	Always	Does Not Apply
1	2	3	4	5	6	7	NA

When playing outdoors, how often did your child:

1. look immediately when you pointed at something?

When engaged in play with his/her favorite toy, how often did your child:

2. continue to play while at the same time responding to your remarks or questions?

After having been interrupted, how often did your child

3. return to a previous activity?
4. have difficulty returning to the previous activity? REVERSED

During everyday activities, how often did your child:

5. pay attention to you right away when you called to him/her?
6. stop going after a forbidden object (such as a VCR) when you used a toy to distract him/her?

During everyday activities, how often did your child seem able to:

7. easily shift attention from one activity to another?
8. do more than one thing at a time (such as playing with a toy while watching TV)?

When interrupted during a favorite TV show, how often did your child:

9. immediately return to watching the TV program?
10. not finish watching the program?

While you were talking with someone else, how often did your child:

11. easily switch attention from speaker to speaker?

When you were busy, how often did your child:

12. find another activity to do when asked?

**Children's EC: ECBQ Inhibitory Control**

As you read each description of your child's behavior below, please indicate how often your child did this during the **LAST WEEK** (the past seven days) by filling in the corresponding bubble to the right of the statement. The "Does Not Apply" column is used when you did not see your child in the situation described during the last week. For example, if the situation mentions your child playing outdoors and there was no time during the last week when your child played outdoors, mark the bubble in the last column.

Never	Very Rarely	Less than Half the Time	About Half the Time	More Than Half the Time	Almost Always	Always	Does Not Apply
1	2	3	4	5	6	7	NA

When asked NOT to, how often did your child:

1. run around your house or apartment anyway? REVERSED
2. touch an attractive item (such as an ornament) anyway? REVERSED
3. play with something anyway? REVERSED

When told "no", how often did your child:

4. stop an activity quickly?
5. stop the forbidden activity?
6. ignore your warning? REVERSED

When asked to wait for a desirable item (such as ice cream), how often did your child:

7. seem unable to wait for as long as 1 minute? REVERSED
8. go after it anyway? REVERSED
9. wait patiently?

When asked to do so, how often was your child able to:

10. stop an ongoing activity?
11. lower his or her voice?
12. be careful with something breakable?

***Children's EC: CBQ Attentional Focusing***

On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction within the past six months.

Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
1	2	3	4	5	6	7

My (This) child:

1. When picking up toys or doing other tasks, usually keeps at the task until it's done.
2. When working on an activity, has a hard time keeping her/his mind on it.  
REVERSED
3. Will move from one task to another without completing any of them.  
REVERSED
4. When drawing or coloring in a book, shows strong concentration.
5. When building or putting something together, becomes very involved in what s/he s doing, and works for long periods.
6. Has difficulty leaving a project s/he has begun.
7. Is easily distracted when listening to a story. REVERSED
8. Sometimes becomes absorbed in a picture book and looks at it for a long time.
9. Has a hard time concentrating on an activity when there are distracting noises.  
REVERSED
10. Has trouble concentrating when listening to a story. REVERSED
11. When watching TV, is easily distracted by other noises or movements.  
REVERSED
12. Is distracted from her/his projects when you enter the room. REVERSED
13. Often shifts rapidly from one activity to another. REVERSED
14. Will ignore others when playing with an interesting toy.

*Children's EC: CBQ Attentional Shifting*

On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction within the past six months.

Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
1	2	3	4	5	6	7

My (This) child:

1. Is hard to get her/his attention when s/he is concentrating on something.  
REVERSED
2. Can easily shift from one activity to another.
3. Has a lot of trouble stopping an activity when called to do something else.  
REVERSED
4. Has an easy time leaving play do another activity.
5. Sometimes doesn't seem to hear me when I talk to her/him. REVERSED
6. Has a hard time shifting from one activity to another. REVERSED
7. Is good at games with rules, such as card games.
8. Can easily leave off working on a project if asked.
9. Often doesn't seem to hear me when s/he is working on something. REVERSED
10. Sometimes has a "dreamy" quality when others talk to her/him, as if s/he were somewhere else. REVERSED
11. Needs to complete one activity before being asked to start on another one.  
REVERSED
12. Seems to follow her/his own direction, even when asked to do something different. REVERSED

*Children's EC: CBQ Inhibitory Control*

On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction within the past six months.

Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
1	2	3	4	5	6	7

My (This) child:

1. Can lower his/her voice when asked to do so.
2. Is good at games like "Simon Says," "Mother, May I?" and "Red Light, Green Light."
3. Has a hard time following instructions. **REVERSED**
4. Prepares for trips and outings by planning things s/he will need.
5. Can wait before entering into new activities if s/he is asked to.
6. Has difficulty waiting in line for something. **REVERSED**
7. Has trouble sitting still when s/he is told to (at movies, church, etc.). **REVERSED**
8. Is able to resist laughing or smiling when it isn't appropriate.
9. Is good at following instructions.
10. Approaches places s/he has been told are dangerous slowly and cautiously.
11. Is not very careful and cautious in crossing streets. **REVERSED**
12. Can easily stop an activity when s/he is told "no."
13. Is usually able to resist temptation when told s/he is not supposed to do something.

*Children's Prosocial Behavior: ITSEA*

Not true

Somewhat true (or  
sometimes)

Very true (or often true)

---

1

2

3

1. Tries to make you feel better when you are upset.
2. Tries to help when someone is hurt. For example, gives a toy.

APPENDIX C  
OBSERVED MEASURES

*Maternal Warmth: Free Play*

**Positive Affect**

How much does mother smile or laugh during the 15-second epoch?

1 = No positive emotion

2 = Low intensity positive. Slight or very brief smile, uses positive tone.

3 = Moderate positive. Clear smile or prolonged slight smiles. Uses more prolonged positive tone.

4 = Intense positive. Intense smile or laugh, or smiling for more prolonged period. May use positive tone.

## ***Maternal Warmth: Teaching task***

### **Warmth**

Epoch: 30 seconds

*General warmth between the child and parent. Focus on the parents' actions and displays of warmth. Included are displays of closeness, friendliness, encouragement, positive affect. Physical affection and quality of the tone/conversation is also important.*

1. None. Parent ignores the child most of the time or displays primarily negative affect.
2. Minimal. Parent generally does not initiate contact (verbal or physical), little positive affect is displayed – but mom is not negative or ignoring the child.
3. Parent is responsive to the child and initiates contact. A little positive affect is displayed.
4. Parent is engaged with the child for much of the time. The parent is warm and touches the child in an affectionate way.
5. Parent is engaged with the child for most of the time. Affect toward the child is positive (frequent smiles and laughter). Positive affect is predominant. Mother is physically affectionate.

### **Positive Affect**

Epoch: 10 seconds

1. No evidence of positive emotion
2. Low intensity positive--*slight/very brief smile OR uses positive tone*
3. Moderate positive --*clear smile or prolonged slight smiles; uses more prolonged positive tone*
4. Intense positive--*intense smile or laugh, or smiling for more prolonged period; may use positive tone*

### *Maternal Sensitivity: Free Play*

Mother's sensitivity to the infant is based upon behavioral evidence of her being appropriately attentive to the baby as well as appropriately and contingently responsive to his/her affect, current level of arousal, interests, and abilities. Sensitivity is evident when both the pace and the level of interaction are contingent upon the baby's actions and responses. Essentially, a sensitive mother follows the baby's signals rather than imposing her own agenda on him/her--behavior which allows the infant to experience contingent responses from people and objects to his/her actions and affect. These experiences theoretically lead to feelings of self-efficacy and trust in relationships.

Lack of maternal sensitivity may be observed in two distinct, but not necessarily mutually exclusive, patterns of behavior which share the common element of not responding to the baby's signals. Some mothers evidence insensitivity by ignoring (missing) the infant's bids for interaction, not responding to the infant's affective signals, and by failing to provide an appropriate-level or amount of stimulation. These mothers are under-responsive in terms of their contingent responsiveness and provision of developmentally appropriate stimulation to the baby. In the context of the laboratory, when we have instructed mother to play with the baby, truly unresponsive behavior, in the sense of ignoring infant bids for attention, is not likely to occur. The type of under-responsive, not "tuned in" mother behavior seen in the free play situation is not codable as unresponsive in the sense that what is seen is more the omission of sensitive behavior rather than the commission of an unresponsive act. Under-responsive mothers "miss" the infant's looks to them or reaches for a toy, and their timing is out of synchrony with the baby's affect and responses. They may also do things like expressing expectations that the baby will do something which is obviously developmentally beyond his/her capabilities or positioning the baby so that he/she cannot reach or manipulate a toy. Such behavior results in low sensitivity scores, because even though mother is doing something, she isn't tuned in to the baby. (Truly unresponsive behavior, seen for example in ignoring crying or bids for attention, is more likely to occur in the naturalistic setting of the home or when we give mother a competing task in the lab setting. Therefore, in our laboratory assessments, the taped ICQ interviews will be coded for unresponsive behavior to infants. Also, mother's response to infant fuss/cry behavior during free play will be noted because "performance oriented" moms may show low sensitivity to infant negative affect in this situation.)

#### **Behavioral Evidence of Sensitive Interaction**

The key defining characteristic of sensitive interaction is that it is baby centered. The sensitive mother is tuned in to her baby and manifests awareness of his/her mood, interests, and capabilities and allows this awareness to guide her interaction (rather than, as is sometimes the case, the perceived demands of the task or the presence of the camera). If the baby is upset or uninterested, mother takes time to soothe, calm, or reengage the infant in a manner that demonstrates sensitivity to the infant's mood before attempting to proceed with the free play or teaching task. In free play the sensitive mother provides one toy or game at a time and bases continuation on the infant's response. How and what they play is geared to whether or not the baby seems to be enjoying the activity.

Mother doesn't persist with an activity or toy in which the infant clearly is not interested nor does she terminate an activity abruptly which the baby obviously is enjoying. A sensitive mother provides stimulation that is developmentally appropriate and facilitates exploration and actions which the infant is capable of achieving. She may encourage the baby to reach for or manipulate an object but not evidence expectations that he/she will do something clearly beyond developmental capabilities. She provides him/her with contingent vocal stimulation, acknowledging the baby's interest, efforts, affect, and accomplishments.

Sensitive interaction is well timed and paced to the baby's responses, a function of its infant centered nature. Mother paces games or toy presentation to keep the infant engaged and interested, but also allows him/her to disengage if highly aroused to calm down and reorganize his/her behavior. Sensitivity involves judging what is a pleasurable level of arousal for the baby and helping the infant to regulate arousal and affect. When the baby loses interest, the sensitive mother switches to a new tactic or toy and observes the baby's reaction. Sensitive mothers are responsive to fussing and crying in an - accepting and soothing manner.

**Specific behaviors characterizing sensitive interaction:**

- providing an appropriate level of stimulation when needed
- acknowledging and responding to baby's affect
- contingent vocalization about what the baby is doing
- facilitating the manipulation of an object or infant movement
- appropriate soothing and attention focusing
- evidence of good timing paced to infant's interest and arousal level
- picking up on the baby's interest in toys or games
- shared positive affect
- encouragement of the infant's efforts
- giving the baby time to explore a toy he is interested in and is managing competently on his own
- maintaining a connection to the infant by vocalizing
- recognizing when the infant is bored with or doesn't like something and making an appropriate change

**Levels of Coding Sensitivity and Intrusiveness**

As indicated on the coding form, the 4-point scale reflects both frequency and intensity of the specific behaviors observed during a coding period. A zero is coded when there is no evidence of the behavior. One indicates one occurrence or a low level of the behavior. Two reflects more than one occurrence, a moderate level, or a more prolonged example of the behavior than would be coded for a one. A three is coded when the behavior occurs at a very high level, is quite intense or prolonged, or occurs repeatedly (three times or more in the coding period). In practice, the range of behavior encompassed by a two tends to be broader than by one or three.

To what extent does mother display sensitive interaction as described above? (To what extent does mother appear to be tuned into and facilitating the baby's agenda versus her own?) Specific behavioral evidence of sensitivity includes:

- providing an appropriate level of stimulation when needed
- acknowledging and responding to baby's affect
- contingent vocalization about what the baby is doing
- facilitating the manipulation of an object or infant movement, **at this age, sensitivity is higher when mom does only what is necessary to assist, thereby allowing the baby to succeed at what he/she is trying to do, indicating mom is tuned in to what the infant can do him/herself**
- appropriate soothing and attention focusing
- evidence of good timing paced to infant's interest and arousal level
- picking up on the baby's interest in toys or games
- shared positive affect
- encouragement of the infant's efforts
- giving the baby time to explore a toy he is interested in and is managing competently on his own (Mothers who do this should be given credit for sensitivity to the infant's interest and capability and not be scored 0 for just watching.)
- maintaining a connection to the infant by vocalizing
- recognizing when an infant is bored with or doesn't like something and making an appropriate change
- Be sure to include mother's responses to child's distress cues, which include crying, gaze aversion, saying "no," physically removing themselves, back arching, etc.

Note 1: The difference between 2 and 3 is often mom's pacing and how well-timed her interactions are, which reflects how much she is paying attention to the baby. At the other end of the scale, a minimally sensitive mother may be interacting with (not ignoring) the baby, but in the service of her own agenda, rather than attending to the baby's interests and signals. Every episode without speaking to the baby is not automatically a "1" if mother is closely watching the baby, who is functioning competently on his/her own, and mother has been maintaining verbal contact before.

1 = None observed during the 15-second epoch

2 = Low, minimal sensitivity

3 = Moderate, more than one instance of the behaviors above or one prolonged or intense instance, clear evidence that mother is more than minimally tuned into the baby

4 = High, mother is very aware of the infant and contingently responsive to his interests, affect, etc.; good timing is evident

(A 3 should not be scored in an epoch with any intrusive behavior scored.)

### *Maternal Sensitivity: Teaching task*

The key defining characteristic of sensitive interaction is that it is baby centered. The sensitive mother is tuned in to her baby and manifests awareness of his/her mood, interests, and capabilities and allows this awareness to guide her interaction (rather than, as is sometimes the case, the perceived demands of the task or the presence of the camera). If the baby is upset or uninterested, mother takes time to soothe, calm, or reengage the infant in a manner that demonstrates sensitivity to the infant's mood before attempting to proceed with the teaching task. Mother doesn't persist with an activity or toy in which the infant clearly is not interested nor does she terminate an activity abruptly which the baby obviously is enjoying. A sensitive mother provides stimulation that is developmentally appropriate and facilitates exploration and actions which the infant is capable of achieving. She may encourage the baby to reach for or manipulate an object but not evidence expectations that he/she will do something clearly beyond developmental capabilities. She provides him/her with contingent vocal stimulation, acknowledging the baby's interest, efforts, affect, and accomplishments.

When the baby loses interest, the sensitive mother switches to a new tactic or toy and observes the baby's reaction. Sensitive mothers are responsive to fussing and crying in an -accepting and soothing manner. Specific behaviors include: providing an appropriate level of stimulation when needed, acknowledging and responding to baby's affect, contingent vocalization about what the baby is doing, facilitating the manipulation of an object or infant movement, appropriate soothing and attention focusing, evidence of good timing paced to infant's interest and arousal level, picking up on the baby's interest in toys or games, shared positive affect, encouragement of the infant's efforts, giving the baby time to explore a toy he is interested in and is managing competently on his own, maintaining a connection to the infant by vocalizing, recognizing when the infant is bored with or doesn't like something and making an appropriate change,

1. None
2. Low, minimal sensitivity
3. Moderate, more than one instance of the behaviors above or one prolonged or intense instance, clear evidence that mother is more than minimally tuned into the baby
4. High, mother is very aware of the infant and contingently responsive to his interests, affect, etc.; good timing is evident.

### *Maternal Structure: Free Play Clean-Up*

All parental codes are coded every 15 seconds and are coded as 0=absent/not observed or 1=present/observed unless otherwise noted.

#### **Gentle Verbal Control/Guidance**

Mother directs child behavior (regarding the cleanup) in a gentle, subtle, or playful manner. No forceful verbal or physical control is present. She tries to get the child to clean up using polite suggestions, hints, playful comments, reasons. She turns the cleanup into a game, for example, sings, claps, throws toys playfully into basket, suggests loading and dumping the truck. Tries to elicit the child's interest and challenge child, e.g., "Can you do this?" Often uses positive incentives, e.g., "Good boy/helper", "Good!", "Great job", "What a throw!", "Yeah!" Mother demeanor is playful, encouraging, affectively positive, affectionate; control is understated and "veiled" in play-like and interactive quality. Mother may be monitoring the progress of the cleanup with proximity and/or body posture but may not be giving directives; she may hold the basket to help/prompt child, in the hope that this will be a sufficient hint for the child to continue to clean up. Code also if mother does not pretend that she is playing, but speaks very softly and thus, the pressure is low (unless, of course, she uses threats).

### *Maternal Structure: Prohibition Toys*

All parental codes are coded every 15 seconds and are coded as 0=absent/not observed or 1=present/observed unless otherwise noted.

#### **Gentle Verbal Control/Guidance**

Mother directs child behavior (regarding the prohibition) in a gentle, subtle, or playful manner. No forceful verbal or physical control present. She tries to get the child to comply with the prohibition using polite suggestions, hints, playful comments. She distracts child, for example, offers the legal toys, sings, claps, suggests alternative activities, e.g., "These are the pretties", "Remember, Jimmy, we cannot touch them", "How about we solve this puzzle" said as the child is moving towards the table or is already playing with the toys. Include also positives when the child complies. Mother demeanor is gentle, playful, affectively positive, affectionate; control is understated and "veiled" in play-like and interactive quality. Code also if mother does not pretend that she is playing, but speaks very softly and thus, the pressure is low (unless, of course, she uses threats). Mother may be monitoring the child with proximity and/or body posture, for example, sits near the TT to be ready with a distraction when needed. The mother could also make implicit references to the prohibition by showing empathy with the child, e.g. "I understand that you don't think it's fair that all the fun toys are on the other table."

*Children's EC: Dinky Toys*

**Child's Level of Self- Restraint (effortful control):**

- 1= toddler exhibits no attempt at self-restraint, goes for the toy immediately each time
- 2= toddler exhibits minimal attempt at self-restraint
- 3= toddler exhibits moderate attempt at self-restraint
- 4= toddler exhibits extreme attempt at self-restraint, pulls back each time

*Children's EC: Rabbit and Turtle*

The child is given a baseline score of **1 point** for each trial. To that score, the child is given credit for each curve of the path that they negotiate with the figure.

For each large curve the child must negotiate with the figure, score as follows:

Child keeps the figure on the mat and stays within the lines of the path – **2 points**

Child has the figure above the mat or follows general curvature of path – **1 point**

Child ignores this particular curve – **0 points**

*Children's EC: Snack Delay – Bell and Cup (T2)*

**Child's level of self-restraint (effortful control):**

- 1 = exhibits no attempt at self-restraint, eats/goes for the cracker immediately each time
- 2 = exhibits minimal attempt at self-restraint
- 3 = exhibits moderate attempt at self-restraint
- 4 = exhibits extreme attempt at self-restraint, pulls back during each trial

*Children's EC: Snack Delay – Candy on Tongue (T3)*

**Child's Level of Self- Restraint (effortful control):**

- 1= Child exhibits no attempt at self-restraint, eats the candy immediately each time
- 2= Child exhibits minimal attempt at self-restraint
- 3= Child exhibits moderate attempt at self-restraint
- 4= Child exhibits extreme attempt at self-restraint, tries to beat out the experimenter during each trial

## *Children's Sympathy: E Hurt*

### **Concerned attention “Concern”**

*Eyebrows down and forward over nose, head forward, lower face relaxed (mouth can be open), eyes may squint, very strong (intense) interest. Also coding for empathic concern/sadness – emotional arousal that appears to reflect sympathetic concern for E. Includes all sadness (sad face) except when crying. Arousal is manifested in facial or vocal expressions (sad looks or gestures). Should look at E for at least 3 seconds (unless extremely clear). If it's conceivable to have concern (focused on E for 3+ sec) but can't see face, code as 9. Again, we may not see a lot of this.*

- 1= None.
- 2= Low or vague indication (look for eye squinting or vague sad face).
- 3= Moderate – quick flash or brief indication of concerned attention.
- 4= Intense – seeing concerned attention the majority of the time.
- 999= Uncodable if can't see face for at least 3 seconds (unless Watch E = 0, then Concern = 0).

### **Hypothesis testing “Hypoth”**

*Any attempt to label or understand the problem. Ex – statements/inquiries (“hurt foot”, saying “ow?” in questioning tone). Looks from E's injured foot to the basket that had fallen on it or from E to E's foot. Includes actively looking, bending over, approaching E to look closely at foot.*

- 1= None.
- 2= Low – looking from E to E's foot (no/mild body movement).
- 3= More sustained or a clear act (bending over, approaching foot; or 3+ looks from E to foot).
- 999= Uncodable/can't see face/body.

### *Children's Prosocial Behavior: E Hurt*

#### **Prosocial behavior "Prosocial"**

*Children's spontaneous behavioral efforts to intervene on behalf of the victim, to change the situation, or to alleviate the 'pain' of the E. Includes only direct (kid – E only) behaviors towards E. ex – physically comforting E (hugs, kisses, pats), giving E a toy.*

- 1= none.
- 2= one or a vague indication.
- 3= two times or a clear act.
- 4= three times or more prolonged, intense, and/or sustained.
- 999= Uncodable/can't see face/body.

#### **Prosocial verbalizations (30+ months)**

*Children's spontaneous verbally engaging the experimenter in a helpful way (e.g., "need bandaide?") or verbally comforting of experimenter (e.g., "I'm sorry"; "you'll be OK").*

- 1= none.
- 2= one or a vague indication.
- 3= two times.
- 4= three times or more prolonged, intense, and/or sustained.
- 999= Uncodable/can't hear.

#### **Indirect Helping "Indir Help"**

*Children's spontaneous behavioral efforts to intervene on behalf of the Victim. Includes only indirect helping (vs. direct helping – that would be coded as prosocial). Mainly getting mom's help or mom's attention in order to help (hitting M for attn only, pointing, vocalizations). Getting mom to attend to E.*

- 1= none.
- 2= mild – one quick attempt (pointing at a distance).
- 3= persistent – two or more times or a clear attempt (insistent behavior to get mom's attention – co-occurrence of pointing, vocalization, etc).
- 999= Uncodable/can't see face/body.