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What Makes a Good Helper? Links between Maternal Autonomy Support,
Toddlers' Inhibitory Control, and Early Prosocial Behaviors

by

Erin L. Karahuta

A Dissertation

Presented to the Graduate and Research Committee

of Lehigh University

in Candidacy for the Degree of

Doctor of Philosophy

in

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Abstract

The current study examined the association between maternal autonomy support and 24-month-olds' instrumental helping, empathic helping, and sharing. It was predicted that toddlers' inhibitory control would mediate the relationship between maternal autonomy support and both sharing and empathic helping. Seventy-six mother-toddler dyads participated in lab tasks to measure mothers' provision of autonomy support during a puzzle task, toddlers' instrumental helping, empathic helping, and sharing, and children's inhibitory control during two delay tasks. Mothers also provided reports of children's inhibitory control. Maternal autonomy support was not directly related to instrumental helping, empathic helping, or sharing, but was positively associated with observational measures of toddlers' inhibitory control. Inhibitory control was positively associated with empathic helping and sharing. A mediation model revealed maternal autonomy support was positively associated with toddlers' sharing via toddlers' inhibitory control. Implications for the study of individual differences in early prosocial behavior are discussed.

What Makes a Good Helper? Links between Maternal Autonomy Support, Toddlers' Inhibitory Control, and Early Prosocial Behaviors

By the second year of life, children possess the ability to engage in actions that may provide the foundation for moral behavior across development. The human tendency to care for and help others can be described as prosocial behavior, or “voluntary behavior intended to benefit another” (Eisenberg, Fabes, & Spinrad, 2006, p. 646). Young toddlers enact the earliest forms of these behaviors, as demonstrated in their ability to help, share with, and alleviate others' emotional distress (Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992).

Research demonstrates that multiple, specific types of prosocial behavior emerge in early childhood. These include instrumental helping, characterized as helping another person reach his or her goal in the absence of emotional distress (Warneken & Tomasello, 2006), sharing, defined as sacrificing one's own possessions to benefit another (Brownell, Iesue, Nichols, & Svetlova, 2013), and empathic helping, defined as helping in order to alleviate the emotional distress of another person (Batson, 1987). Each type of prosocial behavior is unique in that each requires different skills and motivation; however, little is known about factors that may facilitate the development of each type of early prosocial behavior. Therefore, I will examine two potential predictors of individual differences in nascent prosocial behavior, namely, parenting and child temperament, and the role each plays in the development of prosocial behavior. Specifically, I will examine maternal autonomy support and its relationship to each type of prosocial behavior, and I predict that this link will be mediated by children's temperamental inhibitory control.

Early Prosocial Behaviors

Instrumental helping. The earliest studies of prosocial behavior, which often took place in the home and relied on mothers' reports of children's behaviors toward family members, found that instrumental helping toward family members can be observed in the first year of life (e.g., Grusec, 1991; Zahn-Waxler, et al. 1992). An example of this observational work examining toddlers' instrumental helping toward their parents, conducted by Rheingold (1982), revealed that children 18 to 30-months-old readily and spontaneously help with chores in the home as well as in lab settings. Furthermore, in this study, all children engaged in instrumental helping behaviors, and the frequency of instrumental helping increased with age.

More recently, researchers have conducted systematic studies on the development of instrumental helping to examine the extent to which children extend this type of behavior to unknown experimenters. At as young as 14 months of age, children possess the ability to retrieve out of reach objects for an experimenter. However, at this age, children help infrequently and lack the ability to help with more complex tasks, such as helping an experimenter by moving an obstacle (Warneken & Tomasello, 2007). By 18 months of age, toddlers' instrumental helping skills become more sophisticated; they possess the ability to help an experimenter with a variety of instrumental tasks, such as removing obstructions or demonstrating an alternate way of obtaining an object, and do so on average in 60 percent of trials, only about 5 seconds after the incident occurs, and in the absence of explicit verbal cues from adults (Newton, Goodman, & Thompson, 2014; Warneken & Tomasello, 2006). Instrumental helping increases with age, with 2-year-olds being about twice as likely to engage in instrumental helping than 18-month-olds (Svetlova, Brownell, & Nichols, 2010).

Importantly, during the lab tasks used to assess instrumental helping, children are more likely to retrieve objects or remove obstructions when an experimenter is experiencing actual need, compared with when an experimenter engages in an intentional action with the same outcome. For example, children do not pick up a pen when an experimenter intentionally throws it on the ground, but children are more likely to pick up a pen when an experimenter mistakenly drops it before writing a letter (Warneken and Tomasello, 2006, 2007). Thus, this research demonstrates that young toddlers base their instrumental prosocial behavior upon their successful representation of others' goals, as well as an understanding of how to assist others by completing the goal.

Sharing. Sharing can be defined as sacrificing one's own possessions to benefit another by alleviating his or her material need (Brownell, Iesue, Nichols, & Svetlova, 2013; Dunfield, 2014). Because sharing requires giving up one's own possessions, it is a costly form of prosocial behavior (Brownell, Svetlova, & Nichols, 2009). Therefore, in order to successfully share, toddlers on average require more input from their environment (such as cues spoken by the person in need) than they do for instrumental helping, which is a non-costly form of prosocial behavior.

Researchers have found evidence that sharing takes place before the age of 2, but that the function of sharing changes as children become toddlers. Hay and colleagues (1991) found that 1 and 2-year-olds were both likely to share toys with peers over a long period of play, sharing on average 3 times per hour. However, 2-year-olds were overall less likely to share than their younger counterparts. In another study examining infants' sharing behaviors, Sommerville, Schmidt, Yun, and Burns (2013) found that 15-month-olds were willing to give one of their three toys to an experimenter who had none.

Despite this evidence of early sharing abilities, when 1-year-olds share, this behavior is thought to primarily occur in order to elicit social interaction from adults and peers, and as children become better able to sustain social interactions by age 2, sharing is less often used as a way to obtain social contact (Hay et al., 1991; Rheingold, Hay, & West, 1976). Furthermore, by age 2, children possess an understanding of ownership, which changes the nature of sharing because children understand that it is costly (Brownell et al., 2013; Fasig, 2000). Therefore, as children approach age 2, the nature of sharing changes in that it becomes more motivated by fulfilling a material need and serves less as a way to establish social interactions.

Primarily, the work on early sharing has been conducted with children 18 months and older and has found the sharing increases in frequency and speed with age. For example, Brownell and colleagues (2013) found that in a study in which 18 and 24-month-olds were given 6 opportunities to share with an experimenter who made her need increasingly explicit, 65 percent of 18-month-olds shared in at least 1 trial, while 96 percent of 24-month-olds shared in at least one trial. Brownell and colleagues found that on average, 18-month-olds required more cues from an experimenter in order to share (i.e., the experimenter repeatedly verbalized her desire for resources while extending an open palm), and only successfully shared after about 45 seconds, after the experimenter explicitly asked the child to share his or her resources. By 24 months of age, most children shared more quickly, doing so before the experimenter explicitly asked for resources (Brownell et al., 2013). Cues seem to be very important in eliciting sharing from toddlers. When children are given very few sharing cues, such as in Dunfield and Kuhlmeier (2013), in which the experimenter was ostensibly sad that she was lacking

resources but did not verbalize her need nor extend her hand toward the items, 24-month-olds have the ability to share but do so infrequently, sharing on average in less than 1 out of 4 trials.

Equitable sharing is a skill that develops slowly over childhood. Brownell and colleagues (2013) found that on average, 18-month-olds share about one sixth of their resources, while 24-month-olds share about one third. However, by 15-months-old, there is some evidence that children understand the expectation that one should share resources equally with others, as indicated by a violation of expectations paradigm (Sommerville et al., 2013), and 3-year-old children explicitly endorse the norm of equitable sharing, but children do not consistently engage in equitable sharing at cost to themselves until age 7 (Smith, Blake, & Harris, 2013).

Empathic helping. By 18 months of age, children also begin to take action to alleviate others' negative affect, for example, by bringing a comforting object or seeking an adult who can intervene, defined as empathic helping. Young toddlers carry out empathic helping less frequently than instrumental helping and sharing because this skill requires a sophisticated understanding of others (Dunfield, 2014). Empathic helping requires children to comprehend another's negative mental state, feel concern on his or her behalf, understand how to alleviate the negative mental state, and be motivated to do so (Batson, 2008; Hoffman, 2008). Children must also move beyond emotion contagion and understand that the emotions they feel are due to the distress of another and not their own need (Hoffman, 2001). Empathic over arousal, also known as personal distress, is negatively related to enacting help (Eisenberg et al., 1993), but children who feel empathy in response to another's need are more likely to engage in prosocial behavior

(Lennon, Eisenberg, & Carroll, 1986; Miller, Eisenberg, Fabes, & Shell, 1996). Because these regulatory abilities are not fully developed, early empathic helping is limited in toddlers (Kochanska, Murray, & Harlan, 2000).

Still, 18 and 24-month-olds can enact simple empathic helping. When provided with cues, 18-month-olds will help an experimenter who is ostensibly experiencing emotional distress by bringing her a comforting object, and this skill increases in frequency and speed when children reach 24 months of age (Svetlova, Nichols, & Brownell, 2010). The same pattern is also seen in the home when children have the opportunity to help family members in emotional distress (Zahn-Waxler, et al., 1992). Children's understanding of others' emotional states supports their ability to engage in empathic helping, even when the person in need does not provide outright cues. Vaish, Carpenter, and Tomasello (2009) found that when 18 and 24-month-olds witnessed an experimenter destroy a target experimenter's possessions, toddlers were more likely to subsequently help the target experimenter with an unrelated task, even though the target experimenter did not provide emotional cues to elicit help. The authors interpreted this behavior as a form of empathic helping because children were able to understand the negative mental state of another, even in the absence of emotional cues, and were able to enact a behavior to alleviate the negative state.

In order for toddlers to engage in empathic helping rather than demonstrating only concern or distress, it is important that it is clear to children how to ameliorate the situation. For example, 2 to 4-year-old children are less likely to engage in empathic helping when an experimenter has ostensibly injured herself than when an experimenter has broken a toy (Dunfield et al., 2011; Dunfield & Kuhlmeier, 2013). In response to an

injury, children are more likely to indicate concern via facial expressions or exhibit personal distress, but are unlikely to engage in comforting behavior, especially if the victim is a previously unknown experimenter (Dunfield et al., 2011). This may be the case because in the instance of a broken toy, there is a clear solution for how to help (i.e., attempt to fix the toy), but it is less clear how to help in response to an injury when there is no apparent solution. However, Svetlova and colleagues (2010) have addressed this methodological issue by using empathic helping tasks in which the child has been previously told of a way to make the experimenter feel better. For example, before the task begins, the child is shown the experimenter's favorite teddy bear that "helps her feel better when she's hurt or sad". Thus, in the subsequent empathic helping task, the child can bring the bear to the experimenter to make her feel better, demonstrating empathic helping. In response to these tasks, children show higher rates of empathic helping compared to tasks in which the appropriate helping behavior is unclear.

What is the relationship between types of prosocial behavior? In recent years, researchers such as Kristen Dunfield (2014) and Marcus Paulus (2014) have proposed that theoretically, early instrumental helping, sharing, and empathic helping should not be correlated. Dunfield (2014) suggests that in order for children to engage in instrumental helping, sharing, and empathic helping, children must first understand that a person is experiencing some kind of need, they must understand the source of that need (or understand why the problem is occurring), and they must be motivated to help the person in need overcome their problem. However, in order to enact these steps, each type of prosocial behavior requires different skills. Instrumental helping requires children to represent another's unmet goal, as well as the solution to that goal, and requires children

to be motivated to assist in completing that goal. Sharing demands that children understand that another is lacking material resources (which in itself may require motivation), and then must be motivated to establish equity, requiring children to overcome the impulse to keep all resources for themselves. Finally, empathic helping requires children to understand another's mental state, understand the cause of the mental state, and possess the motivation to take action to improve the mental state.

Because these three types of early prosocial behavior require distinct skills and motivations, it follows that skill in one type of prosocial behavior may not transfer to skill in another type of prosocial behavior. Few studies have compared types of prosocial behavior in toddlers, and results are somewhat mixed. For example, Dunfield and Kuhlmeier (2013) conducted a study comparing instrumental helping, empathic helping, and sharing in children ages 2, 3 and 4. Children behaved consistently within each type of prosocial task, however, children's behavior across tasks measuring different types of prosocial behavior was not correlated. There are a few examples of additional research to corroborate these findings. Both Eisenberg-Berg and Hand (1979) and Dunfield, Kuhlmeier, O'Connell, and Kelley (2011) found no relationship between instrumental helping and sharing within groups of preschoolers and toddlers, respectively, but in these instances, empathic helping was not examined.

However, other work has found evidence of some associations between types of prosocial behavior. Gross and colleagues (2015) found that in a study of 18, 24, and 30-month-olds, empathic helping was significantly positively associated with both instrumental helping and sharing, but sharing and instrumental helping were not related. In a study of 12 and 15-month-olds, Sommerville and colleagues (2013), found somewhat

contradictory associations to those found by Gross and colleagues, such that they found no relationship between instrumental helping and sharing (and empathic helping was not measured). Complicating this picture further, Pettygrove, Hammond, Karahuta, Waugh, and Brownell (2013) found that instrumental helping and empathic helping were significantly positively correlated in 18-month-olds, but not 30-month-olds, and sharing was not related to either type of helping at either age. The pattern of associations in these studies is not consistent and therefore deserves further investigation to clarify the link between these early prosocial behaviors.

Predictors of individual differences in early prosocial behavior. More consistently, researchers have found that nascent instrumental helping, sharing, and empathic helping do not share the same predictors. This is in line with the theories put forth by Dunfield (2014) and Paulus (2014), arguing that enacting different types of prosocial behavior requires different skills. Thus, specific individual differences should relate to some types of prosocial behavior, but not to all types. For example, Eisenberg-Berg and Hand (1979) found that instrumental helping and sharing are related differently to diverse types of prosocial moral reasoning in children ages 4 to 5, such that sharing is positively associated with reasoning based upon the needs of others and is negatively related to self focused reasoning, while instrumental helping is not significantly related to any kind of prosocial moral reasoning.

More recently, researchers have begun to examine how individual differences in parenting relate to individual differences in instrumental helping, empathic helping, and sharing. Brownell, Svetlova, Anderson, Nichols, and Drummond (2013) found that maternal use of emotion related talk is not related to all types of prosocial behavior.

Mothers who more often engaged in emotion related talk and elicited emotion talk from their children during a book reading task had children who were more likely to engage in empathic helping, as well as what the authors label “altruistic helping,” which required children to give up their own possessions brought from home in order to help an experimenter. There was no relationship between mothers’ emotion related talk and children’s instrumental helping. In a similar study, Drummond and colleagues (2014), also found a link between parents’ use of emotion and mental state talk and 18 and 30-month-olds’ empathic helping, but again, emotion and mental state talk were not related to toddlers’ instrumental helping, and sharing was not examined. Mother-child emotion related talk may be an important socializer of emotion understanding, and may thus predict empathic helping by encouraging children to attend to others’ mental states and providing children with knowledge of how to respond to others’ emotions (Garner, 2003; Laible, 2004). This type of socialization may not affect instrumental helping because instrumental helping does not occur in the context of emotion, but rather is centered on the completion of a goal (Brownell et al., 2013).

Other facets of individual differences in parenting have also been examined in relationship to early prosocial behaviors. For example, Pettygrove and colleagues (2013) found that mothers’ use of directives and sensitive assistance during a cleanup task when children were 18-months-old was positively related to children’s instrumental helping, whereas at 30 months, sensitive assistance was positively related to children’s empathic helping.

Beyond these examples, research on predictors of individual differences in emergent prosocial behavior is lacking, and there is much work to be done in order to

understand how toddlers learn to engage prosocially with others. The research discussed above suggests that parents engage in behaviors that support their toddlers' prosocial behaviors, however the types of parenting that have been examined are limited to sensitivity and specific types of emotion socialization. Furthermore, researchers know little about how individual differences in children's personalities may relate to their readiness to engage in early prosocial behaviors. Likely, parenting behaviors not only directly relate to toddlers' prosocial behaviors, but parenting may also shape toddlers' personalities and foster skills that facilitate toddlers' ability to engage in prosocial behaviors.

The current study therefore seeks to contribute to work in this area by examining two potential predictors of individual differences in early prosocial behavior, namely, mothers' use of autonomy supportive parenting and toddlers' temperamental inhibitory control. In the current study, I will investigate how these two factors each predict individual differences in instrumental helping, sharing, and empathic helping in 24-month-olds.

Autonomy Supportive Parenting

It has been well established that parenting reflecting sensitivity and responsiveness to children's needs is positively related to prosocial behavior in preschoolers and older children, in that this type of parenting promotes warm emotions toward others and interpersonal connections (see Eisenberg, Fabes, & Spinrad, 2006). The current study will examine one facet of sensitive parenting, maternal autonomy support, which has received less attention in how it relates to the development of social behaviors.

The importance of maternal autonomy support is emphasized in Self-Determination Theory (Deci & Ryan, 1985), which puts forth that individuals, including children, possess the inherent need to feel competent and in control of their own choices and behaviors. To support these needs in children, parents should allow children to solve problems, make choices, and achieve goals independently, but within the context of parental guidelines and support, rather than fully dictate children's behavior via punishment or rewards. This is described as autonomy supportive parenting (Grolnick, Kurowski, & Gurland, 1999; Grolnick & Ryan, 1989; Ryan & Deci, 2000). More specifically, parents can demonstrate autonomy support by validating their children's opinions rather than intrusively imposing their own initiative (Clark & Ladd, 2000), by allowing children to complete tasks at their own pace and select their own activities (Isapa et al., 2015), as well as by serving as a secure base from which children can explore their environment without interference (Bernier, Matte-Gange, Belanger, & Whipple, 2014).

As stated previously, autonomy supportive parenting should foster feelings of competence within children, while also fostering children's perception of their ability to exert control over their environment (Deci & Ryan, 1985; Grolnick & Ryan, 1989; Grolnick, Ryan, & Deci, 1991). Both competence and perceptions of control are important in motivating behavior; under these conditions, children not only feel that they have the ability to achieve a certain goal, but their motivation also becomes intrinsic, rather than a result of external pressure from their environment (Clark & Ladd, 2000; Grolnick et al., 1991; Ryan & Deci, 2000). Children who have grown up in an autonomy supportive context should be less likely to engage in behavior in order to gain rewards or avoid punishment, and more likely to do so because they find the behavior itself inherently

rewarding (Joussement, Koestner, Lekes, & Houliort, 2004). Therefore, children who are intrinsically motivated to engage in certain actions will not require external prompting, and will be more likely to spontaneously engage in socially appropriate behaviors and behaviors desired by parents (Grolnick, et al., 1997; 1999). In other words, children internalize the values that have been emphasized to them; they adopt these values as their own and behave in accordance with them (Grolnick, et al, 1997).

Parents who are autonomy supportive may also use strategies that encourage children to engage with parents, while parents who are interfering and are lacking in autonomy support, often labeled as intrusive parents, may lead children to feel over-aroused and overwhelmed because parents are unable to establish behaviors and routines in sync with their children (Ispe et al., 2004). Intrusive parenting when children are 15 months old is predictive of child negativity towards parents, as well as a lack of child engagement with parents when children are 24 months old (Ispe et al., 2004). Therefore, children of autonomy supportive parents may be more likely to attend to messages from parents encouraging positive social behavior because they feel mutual respect and synchrony within their relationship, laying the groundwork for later internalization of values (Kochanska, 2002).

Much of the work on Self Determination Theory has focused on school-aged children's academic achievement and attitudes related to academics. For example, in a study in which researchers implied to first, third, and fifth graders that they had the choice to complete a boring homework-like task, participants reported enjoying the task more and saw more value in the task, and were still as likely to complete the task as children who were told that task completion was mandatory, or children who were

offered material rewards for completing the task (Joussement et al., 2004). Correlational work also supports the link between autonomy supportive parenting and children's academic achievement. In a study of children ages 7 to 10, mothers who were more controlling of how their children completed a homework-like task had children who became less engaged in the task over time, and in general, the children of autonomy supportive mothers showed higher academic achievement over time compared to children of controlling mothers (Fei-Yin Ng, Kenney-Benson, Pomerantz, 2004). In another study, Grolnick and Ryan (1989) found that parents of third to sixth graders who expressed autonomy supportive approaches to parenting during an interview had children who showed higher school achievement and were rated by teachers as better behaved in the classroom. In a later study, it was found that children's perceptions of control over their own behaviors mediated this link (Grolnick, Ryan, & Deci, 1991). This effect seems to hold into adolescence. For example, college freshmen who were given the choice of whether or not to complete an uninteresting task and were also told why the task was beneficial (thus increasing their perceptions of control) were more likely to show persistence on the task than other groups of freshmen who were not given the same information (Deci et al., 1994).

Similar effects have been found with very young children in correlational studies in which infants' perseverance was measured. Grolnick, Frodi, and Bridges (1984) found that 12-month-olds whose mothers were more autonomy supportive when helping their children explore novel toys were more persistent when learning how to operate a new set of novel toys on their own. Other work using similar methods also demonstrates longitudinal links between autonomy supportive parenting during mother-child play at 12

months and children's persistence in using a novel toy at 20 months, as well as greater competence in using the toy (Frodi, Bridges, & Grolnick, 1985). Therefore, although much of the work on maternal autonomy support has focused on older children, there is some existing evidence to suggest that this is an important aspect of the mother-child relationship in late infancy and the early toddler years and may foster skills relating to attention and regulation, aspects of effortful control.

Autonomy support and prosocial behavior. Maternal autonomy support should also predict other positive social outcomes, and in the current study, I will focus on how autonomy support is theoretically linked to emergent prosocial behavior. I predict that autonomy support should foster the skills necessary to engage prosocially with others, in that it allows children to feel that they can competently influence their environment, giving children the tools to intervene on behalf of others. Furthermore, children with autonomy supportive parents should be intrinsically motivated to help others. A study conducted by Roth (2008) yields evidence consistent with this idea. In this study, young adults' perceptions of parental autonomy support was positively related to participants' tendencies to endorse helping others based on others' needs and feelings, rather than helping others for self-oriented reasons, such as gaining approval from others (Roth, 2008). This is consistent with the main idea of Self Determination Theory; autonomy support fosters intrinsic motivation rather than external. Moving beyond this work, the current study will examine the extent to which a mother-child relationship characterized by maternal autonomy support can predict more specific, spontaneous types of prosocial behavior very early in children's lives.

Instrumental helping. There is evidence to suggest that autonomy supportive parenting is linked to the development of early instrumental prosocial behavior. In an early study examining children's willingness to help parents with everyday household chores, Rheingold (1982) found that when trying to elicit children's help, parents tended to structure tasks in such a way that the tasks became more accessible and engaging to children, such as by doing tasks at the child's pace and narrating their actions. This is evidence that parents structure cooperative interactions so that children are able to understand and complete them, thus using autonomy support to facilitate children's ability to help others reach simple, instrumental goals. There is also evidence that in other contexts, autonomy support is positively related to children's prosocial behavior. Pettygrove and colleagues (2013), found that during a cleanup task, mothers' provision of scaffolding, which is closely related to autonomy support in that it incorporates children's goals, does not interfere with children's behaviors, and does not include mothers completing the task on their own, was positively predictive of instrumental helping in children 18 months old. Other work has also found that age appropriate scaffolding during a clean up task is positively related to prosocial behavior, this time collapsing across both instrumental and empathic helping in children ranging from 18 to 24 months of age (Hammond & Carpendale, 2015). Mothers' use of scaffolding in the context of a clean up task may suggest to toddlers that cooperation is important, as well as teach children cooperative skills, which children can then extend to new contexts which may involve instrumental helping, and maternal autonomy support should function in the same manner.

Empathic helping. Mother's use of autonomy support may also facilitate children's empathic helping, because this kind type of sensitive parenting has the potential to give children the tools and knowledge necessary to help others under challenging conditions. Young children are less likely to enact empathic helping than they are to instrumentally help and share with others (Dunfield & Kuhlmeier, 2013), and young children are less likely than older children and adults to understand how to interpret their own vicarious arousal or even understand how to engage in effective helping behaviors (Eisenberg & Miller, 1987). However, mothers who allow their children to act with minimal interference, but are willing to interject when children need assistance, may raise children who are more confident in their ability to independently help those in distress, and furthermore, these children may have learned helping strategies from mothers' appropriate intervention. For example, after viewing another in distress, an autonomy supportive mother may suggest behaviors that would alleviate the other's discomfort, thus encouraging future helping in new contexts, while mothers who are more dominating and controlling will not encourage children to act on their own, nor will they convey skills for doing so.

Few studies have examined the relationship between maternal autonomy support and empathic helping specifically, but the limited research available suggests there may be an important link between the constructs. The extent to which mothers scaffold a cleanup task is significantly positively predictive of empathic helping in 30-month-olds (Pettygrove et al., 2013), and furthermore, maternal autonomy support has been found to be positively predictive of kindergarteners' concurrent prosocial behavior as rated by teachers, using a measure of prosocial behavior reflecting kindergarteners' empathic

concern and the likelihood they would extend help to someone experiencing emotional distress (Clark & Ladd, 2000). The current study seeks to shed more light onto this relationship.

Sharing. There is also little work directly supporting a link between maternal autonomy support and early sharing. However, I predict that autonomy support may positively relate to early sharing by fostering children's intrinsic motivation to act prosocially. There is evidence that intrinsic motivation is indeed an important component of early sharing. Ulber, Hamann, and Tomasello (2016) found that after receiving a material reward for sharing from a third party onlooker, 3-year-olds were subsequently less likely to share in the absence of a reward compared to children who received only praise or no reward in previous trials. This demonstrates that internal, rather than external pressures, serve as motivation for spontaneous sharing, and thus parents who seek to control children's behavior via rewards and punishments may undermine sharing, but parents who foster children's sense of competence and control may support the development of early sharing.

Mechanism Linking Autonomy Support and Prosocial Behavior

In addition to examining the relationship between maternal autonomy support and these distinct types of prosocial behavior, I plan to examine a potential mechanism that may account for the link between maternal autonomy support and children's prosocial behavior. I propose that children's inhibitory control is a likely mechanism, because autonomy support has been linked to early regulatory abilities, and these regulatory abilities have also been consistently, positively linked to children's prosocial behavior.

Inhibitory Control. Researchers view inhibitory control as an aspect of temperament that allows an individual to inhibit or modify inappropriate behaviors in order to engage in more appropriate behaviors for a given context (Kochanska, Murray, Jacques, Koenig, & Vandergast 1996; Rothbart, 2007). This facet of temperament is typically categorized under the broader temperamental dimension of effortful control, defined by Rothbart and Bates (2006) as the aspect of temperament allowing children to make adaptive choices under conflict, facilitating the ability “to inhibit a dominant response and/or to activate a subdominant response, to plan, and to detect errors” (p. 129). The current study will focus only on inhibitory control rather than effortful control more broadly in order to isolate this construct as a specific mechanism that may result from autonomy supportive parenting, and that may facilitate specific types of early prosocial behavior.

Socialization of inhibitory control. Although temperament is thought to have biological underpinnings, researchers have theorized that temperament also develops in relation to many contextual factors (Bates & Pettit, 2007). Indeed, there is evidence that the phenotypic expression of individuals’ temperament is influenced by their environment, including the type of parenting an individual is exposed to (Belsky and Pluess, 2009; 2013; Rothbart, Ahadi, & Evans, 2000). Belsky and Pluess (2009) put forth that positive and negative parenting can re-shape and determine the temperament of children whose predispositions put them at risk. In other words, children who are negatively reactive may be more positively impacted by positive environments and more negatively impacted by negative environments compared to other children. Various pieces of evidence support the idea that parenting can shape temperamental outcomes.

For example, in a study by Kim and Kochanska (2012), children who were high in negative emotionality at 7 months showed high levels of effortful control and self-regulation at 25 months if they were exposed to sensitive, responsive parenting at 15 months (Kim & Kochanska, 2012). The authors propose that sensitive, responsive mother-child relationships are important for promoting self-regulation at this young age. Additional research supports this idea, showing that preschoolers who are poorly regulated, as indicated by low vagal tone suppression, display improved regulation in the face of a challenge if they have parents who are supportive and are not over-controlling. Furthermore, these children reach positive behavioral outcomes that match or even surpass the outcomes of well-regulated preschoolers (Hastings, Sullivan, McShane, Coplan, Utendale, & Vyncke, 2008).

The current study focuses on maternal autonomy support as a socialization strategy for shaping children's inhibitory control. According to Self Determination Theory, autonomy support should foster regulation by supporting children's sense of control, such that children of autonomy supportive parents feel as though they can determine their own behavior, rather than having their behavior controlled by external pressures (Grolnick et al., 1997; 1999, Grolnick & Ryan, 1991). In other words, self-regulation becomes "integrated" with one's sense of self (Deci, et al., 1994).

Furthermore, researchers argue that mothers who use autonomy support during problem solving tasks may demonstrate skills that help children to guide and regulate their own behavior, such as talking through a difficult task. Children can then internalize these skills and use them to regulate their behaviors in novel contexts (Hammond, Müller,

Carpendale, Bibok, & Lieberman-Feinstone, 2012; Hughes & Ensor, 2009; Landry, Miller-Loncar, Smith, & Swank, 2002).

There is empirical evidence to support the hypotheses put forth by Self Determination theorists. In a study of children 18 and 26 months old, maternal autonomy support positively predicted children's ability to suppress a dominant response, even when controlling for general maternal sensitivity (Bernier, Carlson, & Whipple, 2010). Other work has found longitudinal links between autonomy support and self-regulation, with maternal autonomy support at 15 months positively predicting children's inhibitory control, attentional control, and cognitive flexibility at age 3 (Matte-Gange, Bernier, & Lalonde, 2015). Studies of 12-month-olds also offer evidence that maternal autonomy support during infancy predicts persistence in executing novel tasks in toddlerhood, reflecting toddlers' ability to inhibit their desire to abandon a difficult task (Frodi et al., 1985; Grolnick et al., 1984). Additionally, maternal autonomy support in the context of completing a difficult task at ages 2 and 3 predicts aspects of self-regulation related to inhibitory control at age 5, namely attentional control and cognitive flexibility (Hammond, et al., 2012). Researchers have also found that parental autonomy support and scaffolding when children are 2 years old predicts effortful control at age 4 above and beyond other measures of cognitive development and previous scores in effortful control, suggesting that parenting is shaping temperament (Hughes & Ensor, 2009). Furthermore, there is evidence from maternal and teacher reports that maternal autonomy support predicts regulation in adolescence (Grolnick & Ryan, 1989). Thus, it appears that this type of parenting makes important, causal contributions to the socialization of

children's effortful control, offering good evidence that effortful control may serve as a mediator between maternal autonomy support and prosocial behavior.

Early individual differences in effortful control and prosocial behavior.

Researchers have observed individual differences in inhibitory control early in children's lives (Kochanska, et al., 2000) and these individual differences are often related to individual differences in children's social behaviors (Eisenberg et al., 2007). Inhibitory control should allow individuals, including children, to control their reactions and behaviors so that they are able to enact behaviors appropriate for a given situation, as well as refrain from engaging in behaviors or impulses that are inappropriate (Eisenberg et al., 2007; Rothbart, 2007; Rothbart & Bates, 2006). Research has well established that inhibitory control relates to prosocial and moral development, and this research has particularly focused on preschool and school-aged children. For example, Scrimgeour, David, and Buss (2016) found that children who were better able to regulate their reactions during a disappointing gift task at 3.5 years of age were rated by parents as more prosocial on a measure of combined instrumental helping, sharing, and comforting at age 4. Furthermore, Laible, Carlo, Davis, and Karahuta (2016) found evidence that effortful control is longitudinally related to prosocial behavior, demonstrating that effortful control at 54 months is predictive of prosocial behavior at 15 years old, and is negatively related to aggressive behavior in grade school. Williams, Moore, Crossman, and Talwar (2016) also found evidence of the role inhibitory control in predicting positive social behavior in middle childhood and early adolescence; children ages 6 to 12 who scored higher in inhibitory control were more likely to respond to an experimenter prosocially by claiming they liked a disappointing gift given by the experimenter. These

examples illustrate that inhibitory control facilitates prosocial behavior across childhood. Inhibitory control is likely essential to the development of children's internalized conscience because it allows children to refrain from engaging in impulsive behaviors in favor of behaviors which children recognize as being socially appropriate or morally acceptable (Kochanska et al., 1996; Kochanska et al., 2000).

One novel contribution of the current study is the investigation of how inhibitory control relates to distinct types of emerging prosocial behavior in toddlers. I predict that that the relationship between inhibitory control and prosocial behavior will differ based on the type of prosocial behavior examined.

Instrumental helping. Instrumental helping is perhaps the least complex form of prosocial behavior examined as part of the current study, in that it involves recognizing a concrete rather than an emotional need that can be alleviated at no cost to the helper (Dunfield, 2014). Researchers have noted that toddlers 18 through 30 months old spontaneously and enthusiastically enact instrumental help on behalf of adults (Rheingold, 1982). Furthermore, researchers have demonstrated that children carry out instrumental helping because they are intrinsically motivated to do so. For example, there is evidence that giving 20-month-old children material rewards for helping leads to subsequent decreases in helping, undermining children's inclination to help others (Warneken & Tomasello, 2008). Therefore, for toddlers, instrumental helping may itself be a dominant response rather than a subdominant response, and it is predicted to share no association with toddler's inhibitory control. If toddlers fail to engage in instrumental help, it may be because they fail to attend to the person in need, rather than fail to exhibit inhibitory control.

Empathic helping. Enacting empathic helping requires one to regulate their desire to avoid or retreat from a negatively evocative scenario, which would prevent the individual from engaging in prosocial behavior (Batson, 1987; 2008). Because inhibitory control allows children to inhibit or adapt a dominant action, theorists have suggested that this component of temperament should be related to the regulation of emotion and the activation of socially appropriate behaviors (Rothbart, 2007). For example, young children who perform better on a battery of effortful control tasks, including tasks measuring inhibitory control, are better able to display positive emotion after being given an unappealing gift (Kieras, Tobin, Graziano, & Rothbart, 2006), as well as regulate their expressions of frustration and happiness during lab tasks designed to elicit these emotions (Kochanska, Harlan, & Murray, 2000). The ability to inhibit behavior as well as activate behaviors, especially behaviors that are not automatic, is also thought to relate to the ability to regulate distress in response to an emotional scenario (Eisenberg et al., 2007; Rothbart, 2007; Valiente et al., 2004). Therefore, children with good regulatory abilities should be more likely to enact empathic help, in that they will be able to refrain from engaging in behaviors motivated by a negative emotional response to someone who is experiencing a negative mental state themselves. Instead of becoming overwhelmed by their own negative emotions, children with good regulatory skills should be able to control their own emotional responses and engage in empathic helping to alleviate the person's negative state (Batson, 1987; 2008; Eisenberg, Hofer, & Vaughn, 2007; Rothbart, 2007).

There is evidence that behavioral measures of inhibitory control are related to children's prosocial and moral behaviors toward individuals in distress. Children ages 4

to 8 years old who are low in effortful control (including measures of inhibitory control) show higher personal distress in response to witnessing a peer in need (Valiente et al., 2004). Additionally, Kochanska, Murry, and Coy (1997) found that inhibitory control in toddlers and preschoolers is longitudinally related to children's moral development at school age; children who show greater inhibitory control as toddlers and preschoolers are more likely to self-report that they would help those in emotional distress at personal cost to themselves, and they report higher levels of moral emotions years later. Scrimgeour and colleagues (2016) have also found that physiological indicators of regulation at 3.5 years of age are related to an overall measure of prosocial behavior including empathic helping at age 4. Similarly, Eisenberg et al. (1996) found that children ages 3 to 7 who are better regulated, as indicated by physiological measures, are more likely to express sympathy toward others in need two years later. This research conducted with older children provides good reason to hypothesize that the roots of early empathic helping may be supported by children's inhibitory control.

Sharing. Children's ability to control their impulses may also serve them well in the context of sharing. Sharing is a costly type of prosocial behavior in that it requires children to sacrifice their own valued resources, and inhibitory control may allow children to override their desire to retain all resources for themselves and instead engage in prosocial behavior by giving their resources to someone in need. There is indeed evidence to suggest that in younger children, inhibitory control is related to children's ability to engage in tasks that children may not enjoy, but are socially appropriate. For example, children's inhibitory control at 22 months is positively related to their ability to follow a novel rule, such as being told they cannot touch engaging toys on a toy shelf

(Kochanska et al., 2000). This type of self-restraint may relate to children's ability to engage in costly sharing, because both skills require children to inhibit what is likely their dominant response in order to give up their access to appealing items. Other work directly links inhibitory control to prosocial behavior in preschoolers and elementary school aged children. Paulus and colleagues (2014) found that children's inhibitory control at 24 months and 30 months, as indicated by behavioral measures and parental report, was positively correlated with children's sharing at age 5. Furthermore, in another study of children ages 4 to 6, costly sharing during a dictator game was positively predicted by children's inhibitory control (Aguiliar-Pardo, Martinez-Arias, & Colmenares, 2013). There is also evidence that inhibitory control is related to the sophistication of children's sharing abilities in elementary school. Blake, Piovesan, Montinari, Warneken, and Gino (2015) found that while elementary school children ages 6 to 12 endorse norms of equitable sharing, children who are low in inhibitory control are less likely than other children to act in accordance with these norms when given the opportunity to share their own resources. Furthermore, sharing may also be difficult for children to enact because young children have a poor understanding of numerical properties, as suggested by research demonstrating that preschoolers' ability to distribute resources fairly improves as their understanding of numerical properties becomes more sophisticated (Chernayk, Sandham, Harris, & Cordes, 2016). Thus, children who are higher in inhibitory control may be better able to keep in mind numerical properties and norms of fairness and thus suppress the desire to keep most resources for themselves when faced with the opportunity to share.

The Current Study: Proposed Models Predicting Early Prosocial Behaviors

Although researchers have established that toddlers possess the ability to engage in a variety of prosocial behaviors, little is known about how these skills develop. This is a question deserving of attention, because it is important to understand how the foundation for kindness and moral behavior is shaped in its earliest forms. Prior research has suggested that limited aspects of parenting, such as parents' emotion related talk, may foster early prosocial behaviors, but other aspects of parenting should also be examined. Autonomy supportive parenting is known to positively relate to children's academic achievement and perseverance (Grolnick & Ryan, 1989), as well as young adults' prosocial behavior (Roth, 2008), but researchers have yet to examine if this type of parenting facilitates early prosocial behaviors in toddlers. Furthermore, researchers have yet to identify how toddlers' own individual differences relate to their emerging prosocial behavior. Prior research has established that inhibitory control is positively related to older children's ability to engage in challenging social behaviors (Kochanska et al., 2000), and Self Determination Theory suggests that maternal autonomy support should foster children's self-control (Deci & Ryan, 1985).

The current study expanded upon this work by investigating predictors of early prosocial behavior in 24-month-olds. This age group was selected to participate in the study for a few reasons. First, there is evidence that autonomy support early in life is particularly important in shaping development. Although autonomy support is relatively stable from infancy into the preschool years, on average, autonomy support decreases over time (Matte-Gagné, Bernier, & Gagné, 2013). Furthermore, early autonomy support may be particularly important to the development of social behaviors, with one recent study finding that children of parents who are autonomy supportive early in life tend to

show the most rapid decrease in aggressive behavior from preschool to elementary school (Rajendran, Kruszewski, & Halperin, 2016). Second, as stated previously, researchers have found that toddlers first begin to enact diverse types of prosocial behavior by 18 and 24 months of age (e.g., Warneken & Tomasello, 2006; Svetlova et al., 2010). However, while most children are able to enact instrumental helping at 18 months, sharing and empathic helping, which are thought to be the later developing of these three types of prosocial behavior, occur infrequently at 18 months but increases thereafter (Dunfield & Kuhlmeier, 2013; Svetlova et al., 2010). Thus, studying 24-month-olds increased the likelihood of observing the prosocial behaviors of interest. Finally, there are few reliable measures of inhibitory control for children younger than 24 months old, and behavioral measures of inhibitory control are rarely (if ever) administered to children under 24 months old. Studying this age group therefore allowed the use of available measures of inhibitory control.

Children and mothers visited a lab playroom and took part in behavioral tasks measuring autonomy support, prosocial behavior, and inhibitory control. Mothers also provided additional reports of children's inhibitory control. Specifically, I examined the relationship between maternal autonomy support and instrumental helping, sharing, and empathic helping. I proposed that children's inhibitory control would mediate the positive link between maternal autonomy support and distinct types of prosocial behavior. However, because each type of prosocial behavior requires different skills, I did not predict that inhibitory control would predict each type of prosocial behavior. Specifically, I hypothesized that inhibitory control would not mediate the positive link between maternal autonomy support and instrumental helping, but that inhibitory control would

mediate the positive link between maternal autonomy support and empathic helping, and that inhibitory control will mediate the positive link between maternal autonomy support and sharing (see Figure 1).

Method

Participants

Children were recruited to participate in the study as close to turning 2 as possible, and their ages ranged from 23 to 25 months old ($m = 24.26$ months).

Participants were recruited through a database of families who had previously expressed interest in participating in research studies, and additional participants were recruited through online advertisements.

Eighty-three parent-child dyads participated in the study, and 7 families were excluded for the following criteria: 3 families took part when children were not within 2 months of turning 2, 1 parent did not follow instructions and coached the child throughout the session, and 3 fathers took part with their child. Father-child dyads were excluded from the study because there is evidence to suggest that there are stronger links between mothers' autonomy support and children's outcomes. For example, mothers' use of autonomy supportive parenting is linked to academic achievement in elementary school, but fathers' use of autonomy support is not linked to these outcomes (Grolnick & Ryan, 1989), and mothers are rated as more autonomy supportive and involved than fathers (Grolnick et al., 1991). Fathers were not examined separately due to the small sample size. A sample of 76 mother-child remained.

Demographics. Of the 76 participants included in the final sample, 40 were female and 36 were male. The sample largely consisted of White families: 57 families were White, 2 were Black, 7 were Hispanic/Latino, 1 was Asian, 5 were of mixed

race/ethnicity, and 4 classified themselves as “other” or did not wish to report. Mothers’ ages ranged from 19 to 45 years old ($m = 33$ years old). Mothers were highly educated, with 82% holding a college or post-college degree. Fifty-seven percent of children attended daycare or preschool.

Procedure Overview

Mothers and children visited an on-campus lab playroom. The entire lab session was video recorded. First, mothers and children engaged in 5 minutes of free play with a variety of toys. This allowed children to feel comfortable in the lab environment. Next, two experimenters joined the dyad and played with the mother and child for 5 minutes so that the child could become comfortable interacting with each experimenter. The child then engaged in the tasks used to assess inhibitory control, prosocial behavior, and parenting. The tasks were presented in two orders.

The child took part in 4 instrumental helping tasks, 2 sharing tasks, and 2 empathic helping tasks. The child also took part in two tasks to assess inhibitory control. While the child engaged in behavioral tasks with the experimenters, the child’s mother completed a series of questionnaires, providing additional measures of the child’s temperament. Mothers and children also participated in a challenging dyadic puzzle task to measure maternal autonomy support. At the end of the study, the child was given a small prize for participation.

Observational Measures

Prosocial behavior. Two European American, female experimenters administered the prosocial tasks. One experimenter, hereafter known as E1, set up each task and provided the child and mother with instructions. The second experimenter,

hereafter know as E2, played a more passive role in that she was always the person in need during the prosocial tasks. During the lab session, she did not give the child any instructions or make any demands in order to reduce the chance that the child felt that he or she must help out of compliance toward E2.

Instrumental helping tasks. Children took part in 4 instrumental helping tasks, replicating those used by Warneken and Tomasello (2006). Each task gave the child the opportunity to spontaneously help the experimenter. The tasks included the following:

Crayon task. While drawing a picture, E2 dropped her crayon on the opposite side of the table, near the child, and reached for it.

Stacking task. The child stood at the end of a table, opposite E2. E1 placed a small stack of DVD cases in front of the child, and a small stack of DVD cases in front of E2. E2 reached across the table to place her cases on top of the child's stack, one by one. When E2 attempted to place the last case on the child's stack, the case missed the stack, and E2 reached for it.

Cabinet task. E1 introduced the child to the cabinet, encouraging the child to open the doors to retrieve a toy. E1 left the room, and E2 entered. She opened the cabinet doors and walked across the room to retrieve a small stack of books, which she placed in the cabinet. E2 shut the cabinet doors. E2 then picked up a larger stack of heavy textbooks and repeatedly bumped into the cabinet doors, demonstrating that she needed help opening the doors because her hands were full.

Flap task. E1 introduced the child to a box that had a flap on the side through which the child could retrieve a toy. E1 showed the child how to open the flap to get the toy, ensuring that the child could open the flap by his/herself, and then left. E2 entered

with a teacup and spoon. She set the teacup on top of the box and dropped the spoon through a small hole in the top of the box. E2 unsuccessfully tried to reach through the hole to retrieve the spoon.

Cues. For each instrumental helping task, the child was given 30 seconds to help E2. E2 acted out 3 cues, each lasting 10 seconds:

1. E2 focused only on the target object (e.g., gazing only at her dropped crayon).
2. E2 shifted her gaze from the target object to the child (e.g., alternating her gaze between the child and the crayon approximately 5 times).
3. E2 named the target object (e.g., “Oh, my crayon!”) and continued to alternate her gaze between the object and the child. If the child helped, the experimenter responded by saying “Ah” in a neutral manner. If the child did not help, the experimenter retrieved the object herself.

Coding. For each of the instrumental helping tasks, children were given a helping score of 0 if they failed to help, and a score of 1 if they helped E2. Helping was coded when children completed the target behavior or handed the experimenter the target object. Coders also recorded at what cue the child enacted the help. Children received a Helping Cue score from 3 to 0 (3 = child helps during the first cue, 0 = child does not help). Three raters scored the tasks, and 25 percent of the video recordings were coded in common. Raters showed good reliability, with interclass correlations ranging from .94 to 1.00 for each type of helping task.

Scoring. Children were given a proportion score, representing how many instances they helped E2 out of 4 trials. A mean helping cue score was also calculated, representing the average cue at which the children helped E2 during the 4 trials.

Empathic helping tasks.

Each empathic helping task required the child to understand E2's mental state in order to enact help. Two empathic helping tasks were administered, both modeled after tasks used in Sveltova et al. (2010) with children 18 to 30 months old.

Teddy bear task. Before the task began, E2 showed the child a teddy bear, and told the child that it is her favorite toy and it makes her feel better when she is sad or hurt. She then placed the teddy bear on the opposite side of the room, out of reach. Afterward, she began to play with a hammer and peg toy and ostensibly hit her finger. E2 then feigned intense distress by whimpering, rubbing her finger, and showing facial distress.

Blanket task. Before the task began, E2 showed the child a blanket and told the child that the blanket makes her warm. She placed the blanket across the room, out of reach. Next, E2 began to play with a shape-sorting toy with the child. After playing for about 10 seconds, E2 acted as if she became very cold by chattering her teeth, shivering, and rubbing her arms.

Cues. E2 provided increasingly explicit cues to indicate her need, each lasting 7 seconds.

1. Indicated her internal state behaviorally by signaling that she is in pain or is cold (e.g., by rubbing her finger or shivering)
2. Labeled her internal state ("My finger hurts" or "I'm cold").
3. Made her need known ("I need something to make me feel better" or "I need something to make me warm")
4. Named the object that would alleviate her distress ("The teddy bear!" or "The blanket!")

5. Alternated her gaze between the child and the target object.
6. Made a general request for help, (“Can you help me?”)
7. Explicitly requested the target object (“Can you give me my teddy bear/blanket?”)

Coding. For each of the empathic helping tasks, children were scored for if they completed the target helping behavior (0 = child did not help, 1= child helped). Empathic helping was coded if children retrieved the target item and either handed it to the experimenter or placed it within her reach. If children helped, they were scored for at what cue they helped. Children received an empathic helping cue score from 7 through 0 (7 = child helps during the first cue; 0 = child does not help). Three coders scored the tasks, and 25 percent of each task was scored for reliability. Raters showed excellent consistency (interclass correlations = 1.00 for both tasks).

Scoring. Children were given a proportion score representing the proportion of instances they helped E2 during the 2 trials. Children were also given a cue score, representing the average cue at which children helped the experimenter during the 2 trials.

Sharing tasks. Children participated in two sharing tasks that were modeled closely after those used by Brownell et al., (2013) with children 18 to 30 months old. The procedure for each task was nearly identical, with one task involving sharing toys, and the other task involving sharing food.

Toy sharing. The child and E2 sat side by side at a child-sized table. E1 distributed 6 toys to the child and 6 toys to E2. They were given 30 seconds to play with

the toys. E1 then gathered all of E2's toys and placed them in front of the child. E1 exited, and E2 shifted to the far end of the table so that the toys were out of reach.

Food Sharing. The procedure for the food sharing task was nearly identical to the procedure of the toy sharing task, but with the removal of the initial 30 seconds of play before the task began. E1 placed small plates in front of the child and E2. E1 emptied a small container of food onto the child's plate, and then attempted to distribute food from the empty container to E2, turning the container upside down, shaking it, and saying, "No more".

Cues. During both sharing tasks, E2 provided 4 increasingly explicit cues to indicate her need, each lasting 10 seconds. The cues were the same for both tasks.

1. E2 sighed loudly and frowned slightly, alternating her gaze between the child's toys or snacks and the empty space in front of her.
2. E2 verbalized her need by saying, "I don't have any toys (snacks). I need some toys (snacks) so I can play (eat) too," made eye contact with the child once, and alternated her gaze between the toys and the space in front of her.
3. E2 unsuccessfully attempted to retrieve a toy by reaching across the table and saying, "I can't reach the toys (snacks)," while alternating her gaze between the child and the toys.
4. E2 explicitly asked the child for a toy by holding out her arm, palm up, and making eye contact with the child and saying, "Could I have a toy (snack)?"

Coding. For each of the sharing tasks children were coded for if they shared (0 = child did not share, 1 = child shared). Sharing was coded only when the child handed the experimenter the target item or pushed it toward the experimenter. If the child shared, the

coders recorded at what cue the sharing took place. For each task, children were assigned a sharing cue score ranging from 4 through 0 (4 = child shared during the first cue; 0 = child did not share). Three coders scored the tasks, and 25 percent of recordings were scored in common. Interclass correlations for the tasks ranged from .98 to 1.00.

Scoring. Children were given a sharing proportion score, indicating the number of trials in which they helped out of 2. Children were also given a mean sharing cue score, indicating the average cue at which they helped E2 on both trials.

Maternal autonomy support. Maternal autonomy support was coded from a mother-child puzzle task. The dyad was asked to complete a puzzle that was slightly too difficult for 24-month-olds to complete alone in order to elicit help from mothers. Mothers were told that they should put the puzzle together with their child like they would at home, and that they would have 3 minutes to complete as much of the puzzle as they could.

The interaction was coded based off a coding scheme used by Whipple, Bernier, and Mageau, (2011), that has also been used in other studies (for other examples, see Bernier et al., 2010; Bernier et al., 2014). Autonomy support was coded from videos of the interaction using a scale capturing the extent to which mothers provided appropriate help, encouragement, and supported the child's volition by allowing the child to make his/her own choices and complete the puzzle at his/her own pace. Autonomy support was coded from 1 to 5 (with 5 indicating extremely autonomy supportive parenting) (see Appendix A). Two coders scored 23% of the puzzle tasks in common and had adequate reliability with an interclass correlation of .88.

Inhibitory control. Measures of children's inhibitory control included snack and gift delay tasks. These tasks replicated those used by Kochanska et al., (2000), which were used with children 22 and 33 months of age. Bernier and colleagues (2010) also successfully used each of these tasks with 26-month-olds, and Spinrad et al., (2007) successfully used snack delay tasks with 18 and 30-month-olds, suggesting that these are age-appropriate tasks to use for the current sample.

Snack delay. Children were instructed to wait for up to 30 seconds (indicated when E1 rang a bell) before eating a cookie that was placed underneath a transparent cup. Halfway through the trial, E1 picked up her bell, but did not ring it until the end of the trial. Four trials took place, with children waiting 10, 15, 20, and 30 seconds. Trials were coded for how long the child waited before eating the cookie or completely abandoning the task (i.e., leaving the table to do something else). If the child waited until E1 rang her bell at the end of the trial, the child was coded as waiting the maximum length of the trial. The total amount of seconds each child waited during the four trials was summed, for a maximum score of 75 seconds. Two coders recorded the amount of time waited during each trial, scoring 20% of the videos in common. The coders had good reliability, with an interclass correlation of .99.

Gift delay. E1 entered the playroom with gift-wrapping supplies and told the child that she had a surprise for the child, but she did not want the child to see the surprise until she finished wrapping it. She asked the child to sit in a chair, with his or her back to E1, while E1 wrapped the present. E1 emphasized to the child that he/she should not peek while she wrapped the present, and she proceeded to wrap the present for 60 seconds. Then, E1 told the child that he/she could get up from the chair, but that she had

to clean up her gift-wrapping supplies. The child was told that he/she could not touch the gift until E1 was finished cleaning up. E1 cleaned up for 60 seconds.

This task was coded in 5-second increments, on the following dimensions, meant to capture the extent to which the child followed E1's instructions. During the gift-wrapping portion of the task, during each 5-second increment, coders recorded the following behaviors, assigning a score of 0 if the behavior was not present, or a score of 1 if the behavior was present:

No peeking: The child does not face/look at E1

Sitting in chair: The child is seated in the chair E1 instructed him/her to sit in

Disengagement: The child is engaging in an activity that is completely unrelated to the gift task (e.g., climbing on mother or running around the room)

A proportion score was created for all codes by dividing the sum total of each score by the total number of 5-second increments for the task.

During the cleanup portion of the task, during each 5-second increment, coders recorded if the child refrained from touching the gift, assigning a score of 1 if the child did not touch the gift (following E1's instructions), or a score of 0 if the child did not touch the gift. A proportion score was calculated, indicating the proportion of 5-second segments during which the child did not touch the gift.

Two coders scored both phases of the task, coding 20% of videos in common, and showing adequate reliability (interclass correlation for not peeking = .83, for sitting in chair = .88, for disengagement = .93, for not touching the gift = 1.00).

Early Childhood Behavior Questionnaire

Mothers provided a report of their child's temperament by filling out the Early Child Behavior Questionnaire Short Form, including a scale measuring children's inhibitory control, which will be used in the current study (Putnam, Garstein, & Rothbart, 2006). This scale consists of 6 items that are rated on a scale from 1 (low) to 7 (high) (see Appendix B). This scale showed acceptable internal consistency ($\alpha = .75$).

Covariates

Demographic information, including children's gender, mothers' level of education (scored as 1 = some high school, 2 = high school degree/GED, 3 = some college, 4 = college degree, 5 = post college degree), mothers' age, children's race/ethnicity (scored dichotomously as European American or racial or ethnic minority), and children's daycare attendance (scored dichotomously as attends daycare or does not attend daycare), was provided by mothers to be analyzed as potential covariates.

Results

Overview

Means and standard deviations can be found for all variables in Table 1. Bivariate correlations were run on all measures and covariates to determine relationships between variables (see Table 2). On the basis of these correlations, mediation models were tested using PROCESS 2.11 for SPSS (Hayes, 2013).

Children's proportion scores on measures of instrumental helping, empathic helping, and sharing were used in all subsequent analyses rather than cue scores because cue scores showed largely showed no relationship with other variables of interest (see Table 3). All observational measures of inhibitory control (total time waited during snack delay, sitting during gift task, not peeking during gift task, disengagement during gift task

reverse scored, and not touching gift post gift task) were standardized into Z-scores and averaged, creating a composite score of observed inhibitory control. Mothers' report of children's inhibitory control on the Early Childhood Behavior Questionnaire Short Form was analyzed separately from observational measures. Correlations between the composite observed inhibitory control variable and covariates, maternal autonomy support, and toddler's prosocial behavior proportion scores can be found in Table 4.

Correlations

Contrary to predictions, there was no association between maternal autonomy support and any type of prosocial behavior. There was, however, a positive correlation between maternal autonomy support and children's observed inhibitory control ($r = .34, p < .05$). Maternal autonomy support and maternal reports of children's inhibitory control on the ECBQ were not related. Consistent with hypotheses, observed inhibitory control was positively correlated with sharing ($r = .26, p < .05$) and empathic helping, ($r = .26, p < .05$) but was not related to instrumental helping. Observations of prosocial behavior were positively correlated. Toddlers' instrumental helping proportion scores were positively associated with empathic helping scores ($r = .51, p < .001$), and sharing scores ($r = .43, p < .001$). Empathic helping scores and sharing scores were also positively correlated ($r = .42, p < .001$). Therefore, toddlers' performance on one type of prosocial task was positively related to prosocial behavior in all other tasks.

There was no relationship between children's gender and any variables of interest. Race/ethnicity was associated with maternal autonomy support ($r = .27, p < .05$), such that European American mothers showed higher levels of autonomy support. There was a positive association of attending daycare and instrumental helping ($r = .28, p < .05$) and

sharing ($r = .34, p < .001$); children who attended daycare were more likely to engage in instrumental helping and sharing. There was a marginally negative correlation between mothers' age and children's sharing ($r = -.23, p = .51$), such that children with older mothers were less likely to share. Mothers who were more highly educated showed higher levels of autonomy support ($r = .24, p < .05$), and had children who shared more frequently ($r = .26, p < .05$). There was also a marginally significant association between mothers' education and children's observed inhibitory control ($r = .20, p < .1$). Thus, on the basis of these relationships, mothers' level of education, mothers' age, race/ethnicity, and children's daycare or preschool status were selected as covariates for mediation models.

Main Analyses

Although it was predicted that maternal autonomy support and toddler's instrumental helping would be positively related, no regression models examining the relationship between these two variables were built because there was no correlation between maternal autonomy support and toddlers' instrumental helping. Also, contrary to hypotheses, there was no relationship between maternal autonomy support and empathic helping or sharing. However, two mediation models were constructed to test the indirect effect of autonomy support through toddlers' observed inhibitory control on these two types of prosocial behavior. The positive correlation between autonomy support and observed inhibitory control, as well as the positive association between observed inhibitory control and empathic helping and sharing, gave reason to test these indirect effects (see Agler & De Boeck, 2017; Hayes, 2009; Zhao, Lynn, & Chen, 2010). No

mediation models were tested using mothers' reports of toddlers' inhibitory control because this measure showed no significant association with maternal autonomy support.

Two mediation models (see Figure 1) were tested¹. Mothers' level of education, mothers' age, children's ethnicity, and children's daycare status were entered as covariates for both models. The first model tested the indirect effect of maternal autonomy support on toddlers' empathic helping through toddlers' inhibitory control. This model yielded no evidence of an indirect effect (see Figure 2). The path from inhibitory control to empathic helping was non-significant, and bias corrected bootstrapping indicated the link between autonomy support and empathic helping was not substantially reduced upon the inclusion of the mediator. Therefore, contrary to hypotheses, it cannot be concluded that there is an indirect effect of maternal autonomy support on toddlers' empathic helping through toddlers' inhibitory control.

¹ Analyses were also conducted using a variable produced by a factor analysis of all measures of inhibitory control, including all observational scores (total time waited during the snack delay, peeking during the gift task, sitting during the gift task, touching the gift during the gift task, and disengagement during the gift task) and the maternal report of inhibitory control using the ECBQ. Measures of peeking and disengagement during the gift task were removed from the analysis because preliminary analyses indicated Kaiser-Maier-Olkin measures for each of these measures were below the threshold of 0.5 (Field, 2013). One measure, touching the gift during the gift task, was removed from the factor due to its low loading. This left one factor consisting of time children spent sitting during the gift task (loading at .72), time children waited during snack delay (loading at .59), and maternal report of inhibitory control (loading at .54). This factor was significantly, positively correlated with maternal autonomy support ($r = .24, p < .05$), toddlers' empathic helping, ($r = .24, p < .05$), and toddler's sharing ($r = .38, p < .01$). However, a test of mediation revealed that the model was not significant in predicting toddlers' sharing, or toddlers' empathy. This is likely driven by the ECBQ's weak relationship with observed maternal autonomy support and prosocial behavior.

The second mediation model tested the indirect effect of maternal autonomy support on toddlers' sharing through toddlers' inhibitory control. This model indicated that an indirect effect was present (see Figure 3). There were significant paths from autonomy support to inhibitory control, and from inhibitory control to toddlers' sharing. Furthermore, bias corrected bootstrapping indicated the association between maternal autonomy support and sharing was substantially reduced upon the inclusion of inhibitory control in the model. Therefore, these results support the hypothesized model in part, demonstrating that although there is no direct effect of maternal autonomy support on sharing, there is an indirect effect, such that autonomy support is positively associated with children's inhibitory control, and in turn inhibitory control is positively associated with empathic helping.

Exploratory Analyses

Exploring Overall Prosocial Behavior. Instrumental helping, empathic helping, and sharing were each positively correlated, and to investigate possible links between predictor variables and overall prosocial behavior, each type of prosocial behavior was combined into a score representing toddlers' proportion of prosocial actions across the 8 prosocial tasks. This overall prosocial behavior score was positively correlated with inhibitory control ($r = .36, p < .01$). Overall prosocial behavior was not correlated with autonomy support ($r = .11, p > .05$). A mediation analysis revealed that there was no indirect effect of autonomy support on overall prosocial behavior through inhibitory control (see Figure 4).

Interaction of Autonomy Support and Inhibitory Control. Because there was no main effect of autonomy support on any type of prosocial behavior, exploratory

interaction analyses were conducted to test if an interaction of autonomy support and inhibitory control was suppressing a main effect of autonomy support on toddlers' instrumental helping, empathic helping, and sharing. These analyses revealed no such interactions; when controlling for mothers' age, mothers' education, children's daycare attendance, and children's race/ethnicity, maternal autonomy support did not interact with toddlers' inhibitory control to predict toddlers' instrumental helping, ($b = .12, t(70) = .91, p = .37$), empathic helping, ($b = -.09, t(70) = -.72, p = .47$), or sharing, ($b = -.12, t(70) = -1.02, p = .31$).

Discussion

The broad goal of this study was to examine two predictors of individual differences in nascent prosocial behavior. First, the current study examined if maternal autonomy support directly and positively predicts three types of prosocial behavior in 24-month-olds: instrumental helping, empathic helping, and sharing. This study also examined if autonomy support fosters a component of children's temperament, inhibitory control, which in turn was predicted to positively relate to toddlers' empathic helping and sharing, but not to instrumental helping. In other words, it was hypothesized that inhibitory control would mediate the direct link between autonomy support and sharing, and that inhibitory control would mediate the direct link between autonomy support and empathic helping. I predicted that autonomy support alone would be associated with instrumental helping. Contrary to hypotheses, there were no associations between maternal autonomy support and instrumental helping, empathic helping, or sharing. However, in line with hypotheses, there was a positive association between maternal autonomy support and children's observed inhibitory control. Observed inhibitory control

was also positively related to empathic helping and sharing, but only the model testing the indirect effect of autonomy support on sharing through inhibitory control was supported. This finding supports the hypothesized model in part, demonstrating that maternal autonomy support is linked with toddlers' inhibitory control, which is in turn is positively associated with toddlers' sharing.

Maternal Autonomy Support as a Predictor of Children's Behaviors

As stated above, there was no evidence of a direct relationship between maternal autonomy support and any type of toddlers' prosocial behavior. However, maternal autonomy support was directly and positively associated with children's observed inhibitory control. The lack of relationship between autonomy support and prosocial behavior could be due to the context in which autonomy support was measured. The puzzle task used to measure maternal autonomy support may not have elicited the type of autonomy support that teaches toddlers the skills they must master in order to help others. However, as evidenced by autonomy support's direct, positive link with inhibitory control in the current study, maternal autonomy support during a puzzle task may socialize skills such as regulation, as well as other cognitive skills not measured in this study, such as problem solving. Other researchers have also found positive links between maternal autonomy support and constructs similar to inhibitory control in toddlers, especially executive function. For example, Bernier and colleagues (2010) found that maternal autonomy support measured in the context of a puzzle task when children were 15 months old was related to many dimensions of executive function, such as working memory, impulse control, and attentional shifting when children were both 18 and 26 months old. Hammond and colleagues (2012) have also found that mothers' autonomy

support during a puzzle task when children were ages 2 and 3 was positively related to children's executive function (consisting of measures of working memory, selective inhibition, and attentional control) and independent problem solving when children were 4 years old. The current study's finding that autonomy support is positively associated with inhibitory control is consistent with this work, and is unique in that it focuses on a specific component of temperament rather than broader cognitive or regulatory skills.

In order for parents to provide autonomy support that directly promotes prosocial behavior, it may be more important for parents to help and encourage their children to think about others' needs and emotions rather than to provide supportive assistance during a puzzle task. There are examples of research that point toward this idea; in a study conducted with mothers and children 18 and 30 months old, Drummond and colleagues (2014) found that when mothers more often discussed emotion with their children during a lab task, as well as made attempts to elicit emotion-related talk from their children, children were more likely to help an experimenter in emotional distress. There is a larger amount of evidence to support the idea that high-quality emotion related discourse is important for moral outcomes and conscience development in slightly older children. For example, Laible (2004) found that mothers who more often discuss emotion during conversations with children at 2.5 years of age have children who show more advanced conscience development at 3 years old. Laible and Thompson (2000) also found that mothers' references to emotions during conversations with 4-year-olds are positively related to children's internalization of rules. Furthermore, other researchers who have measured autonomy support using measures relating to discourse between parents and older children, as well as young adults, have found positive links between

maternal autonomy support and young adults' social development. Joussement and colleagues (2005) found that mothers who provided 5-year-olds with more rationale when discussing rules, took their child's perspective, and supported their child's initiative, had children who were rated as more socially adjusted by their teachers at grade 3. Roth (2008) also found that college students who perceived their parents as more autonomy supportive, in that they reported their parents explained rules and tried to understand their point of view, were more likely to engage in prosocial behavior, especially prosocial behavior that was aimed to help others rather than to gain approval.

The idea that autonomy support during parent-child conversations may be particularly important for fostering moral outcomes can be viewed in light of Hoffman's theory of induction. Hoffman (1975) suggested that it is critical for parents to socialize concern for the needs of others by supporting children's understanding of others' feeling and perspectives. He believed that parents could do this by talking to children about how their behaviors impact others, especially in the context of discipline. Therefore, the context following a transgression may be a potentially fruitful time for parents to use autonomy support to facilitate children's understanding of others' thoughts and feelings. Parents could use this context to engage in autonomy supportive discourse by acknowledging their child's perspective and desires, while also using reasoning to point out the perspective of others, and perhaps by providing children with options and support for making reparations for their wrong-doing. This is also consistent with Self-Determination Theory, which suggests that children will be more receptive of parents and will be more likely to internalize parents' messages when parents are not power assertive and do not make choices or demands on behalf of their child, but rather recognize their

child's own needs and help their child make their own choices (Grolnick & Ryan, 1985). The definition of autonomy support need not be operationalized in a way that autonomy supportive parenting is restricted to parenting that supports children's abilities to complete cognitive or academic tasks, which have been previously examined in the literature. Rather, parents can also support children's autonomy in social contexts by giving them suggestions or facilitating ways of thinking that will help their children understand how to respond to challenging social situations in positive ways. Although supportive parenting in the face of an emotionally arousing situation may also require parenting sensitivity, there is reason to examine autonomy support and sensitivity separately. Bernier, Matte-Gagné, Bélanger, and Whipple (2014) have examined the relationship between parental sensitivity and parental autonomy support and found that although sensitivity and autonomy support were positively correlated, each type of parenting made independent contributions to children's outcomes. Thus, perhaps it is important for autonomy support to take place in the context of discourse, especially discourse surrounding emotions or moral issues, in order for this type of parenting to foster prosocial behavior and sociomoral competence. Research has not directly examined how the context of autonomy support may relate differentially to specific prosocial outcomes, and this is an area of research that deserves future attention.

Inhibitory Control – Links with Prosocial Behaviors

Consistent with predictions, children's inhibitory control was positively correlated with both empathic helping and sharing, but was unrelated to instrumental helping. However, models testing the indirect effect of autonomy support on empathic helping and sharing through inhibitory control revealed that there was only a significant indirect

effect on sharing. There was no indirect effect on empathic helping, with the path between inhibitory control and empathic helping becoming non-significant in the context of the model. Control and regulation may make contributions to early empathic helping; however, a different type of regulation may be more essential for carrying out this type of helping. Even at the young age of 24 months, the ability to regulate emotions may be particularly important for enacting empathic help. Enacting empathic help requires the regulation of personal distress, which does not motivate prosocial behavior, but rather motivates an individual to flee a distressing stimulus, i.e., the person in need (Batson, 1987; 2008). Emotion regulation should also allow children to experience empathic concern on behalf of a victim, motivating empathic helping rather than motivating avoidance of the situation (Batson, 1987; 2008). Supporting this idea, Scrimgeour and colleagues (2016) found that physiological indicators of emotion regulation at 3.5 years of age were related to an overall measure of prosocial behavior including empathic helping at age 4. Other researchers, such as Eisenberg and colleagues (1995) have found that school-aged children who use constructive regulation strategies and show greater markers of physiological regulation are more likely to be rated by teachers as more prosocial 1 and 2 years later. Fabes, Eisenberg, Karbon, Troyer, and Switzer (1994) also found that kindergarteners who showed better physiological regulation (as indicated by heart rate) were more likely to comfort an ostensibly crying baby. However, the question of if emotion regulation is predictive of the earliest forms of empathic helping in young toddlers has yet to be addressed and is an area for future research.

There was partial support for the prediction that inhibitory control would mediate the link between autonomy support and toddler's sharing. Rather than full mediation,

there was an indirect effect of autonomy support on sharing via inhibitory control. This finding illustrates the ability to inhibit impulses (e.g., the impulse to keep all toys for oneself), may allow a child to respond prosocially to someone in need of a resource the child possesses. This is consistent with the work of Paulus and colleagues (2014), who found that inhibitory control at 24 and 30 months was positively related to children's willingness to share with a friend at 5 years of age, and is also consistent with a study conducted by Smith, Blake, and Harris (2013) who found that inhibitory control in 3 to 8 years olds is positively related to sharing. The current study is the first to demonstrate this connection in toddlers who are just learning to share.

Finally, as predicted, there was no relationship between toddlers' inhibitory control and their instrumental helping. We theorized that instrumental helping would not relate to inhibitory control because this type of helping is not costly, nor is it negatively evocative such that it would require toddlers to suppress a dominant response in order to perform instrumental help. Furthermore, the lab was set up such that there were as few distractions as possible during instrumental helping tasks. There were no appealing alternative activities for the child to engage in while these tasks were preformed. Mothers were in the room with their children, but were distracted by a questionnaire and were asked to interact with their child as little as possible. Thus, the experimenter in need of help was likely an appealing target on which children could focus their attention and behavior. The children may have also helped the experimenter because they found it inherently rewarding to engage with her. Evidence from other work suggests that 18 and 24-month-olds are very willing to engage in cooperative activities with an adult experimenter, and they will make attempts to reengage an experimenter who is distracted

before they play on their own (Warneken, Chen, & Tomasello, 2006). Thus, children may have engaged in instrumental helping as a way to interact with the experimenter, and perhaps to encourage the experimenter to reengage in play with the child after her mishap was resolved. However, if the instrumental helping tasks took place outside of a minimally distracting lab environment, it may be that inhibitory control would in fact relate to children's instrumental helping. For example, if an experimenter was in need of help while the child was playing with a peer, or while the child played with an attractive item such as an iPad, children would likely need to inhibit their dominant response (continuing their enjoyable activity), in order to carry out instrumental helping. Thus, context could change the costliness and the demands involved in instrumental helping. Researchers know very little about how context affects specific types of prosocial behavior apart from work that compares targets in need of prosocial behavior (e.g., Blandon & Scrimgeour, 2015; Rheingold, Hay, & West, 1976) or helping that takes place in the home as compared to the lab (e.g., Zahn-Waxler et al., 1992). These studies did not systematically examine the amount of distractions the children faced when they were given the opportunity to enact help. Future work should examine how variations in context affect different types of prosocial behavior in toddlers, as well as older children.

Notably, observational measures of children's inhibitory control, but not maternal reports of inhibitory control, were consistently related to autonomy support and prosocial behavior. Longitudinal research indicates that inhibitory control abilities fluctuate before children reach preschool age, and thereafter become more consistent across time (Kochanska et al., 2000). In the current study, mothers reported their children's inhibitory control over the previous two weeks in various contexts. Children's inhibitory control

may have fluctuated across these contexts, and therefore it may be that the inhibitory control children exhibited in the context of the lab environment was most predictive of the prosocial behaviors they also exhibited in the lab environment. Furthermore, the items in the inhibitory control scale of the Early Childhood Behavior Questionnaire mainly pertain to stopping enjoyable activities during daily life. In contrast, during the snack and gift delay tasks administered in the lab, children were not asked to disengage from an activity they enjoyed, but were rather asked to follow novel rules in a setting with minimal distractions. It may be that the type of inhibitory control measured by the Early Childhood Behavior Questionnaire requires broader skills, such as attentional control in order to distract oneself from appealing activities, which were not fostered by maternal autonomy support. There is work that corroborates these findings; Spinrad and colleagues (2007) found that observations of 16 to 20-month-olds' inhibitory control were more strongly related to observations of children's social competence than mothers' ratings. Furthermore, Gross and colleagues (2015) found no relationship between scales in the ECBQ and observational measures in 18 to 30-month-olds.

Relationships between Prosocial Behaviors

The current study found that the three types of prosocial behavior examined were positively correlated. Previous findings in this area of research are extremely mixed in the degree to which relationships between types of early prosocial behaviors are found. Despite this, the evidence from the current study is consistent with the work of Newton, Thompson, and Goodman (2016) who found three consistent classes of prosocial behavior in toddlers: toddlers who were frequently prosocial, toddlers who were moderately prosocial, and toddlers who were not prosocial. Similarly to the current study,

Newton and colleagues allowed children 30 to 60 seconds to enact help and provided cues to alert children to the fact that help was needed. This methodology is in contrast with methods used by Dunfield (see Dunfield et al., 2011; Dunfield & Kuhlmeier, 2013), for example, who found that when children were given 10 seconds and only one cue to enact instrumental helping, empathic helping, and sharing, there was no relationship between these types of prosocial behaviors. Thus, these inconsistent findings regarding correlations across types of prosocial behavior may come down to the context in which help is carried out. When children have little time to enact help, prosocial behavior may look very different across types of tasks because types of prosocial behavior vary in difficulty for toddlers (Svetlova et al. 2010). However, when children are allowed ample time to process the situation, and are given cues to improve their understanding of the situation, types of prosocial behavior seem to be more related than suggested by Dunfield and others who suggest that types of early prosocial behaviors share no relationship (e.g., Paulus, 2014; 2018).

Covariates: Gender, Daycare Attendance, and Race

There were no effects of gender in the current study, which is consistent with the work of other researchers who typically do not find links between early maternal autonomy support and gender (see Whipple et al., 2011), or links between gender and early prosocial behaviors (Brownell et al., 2013; Drummond et al., 2014; Newton et al., 2016). Rather, gender differences in prosocial behavior seem to emerge as children get older, perhaps due to socialization (Eisenberg, Spinrad, Knafo-Noam, 2015). Somewhat surprisingly, there was no effect of gender on children's inhibitory control, which is inconsistent with work finding that girls perform better on snack and gift delay tasks at

ages 2 and 3 (Kochanska et al., 1996; Kochanska et al., 2000). However, Kochanska and colleagues (2000) find that inhibitory control becomes more stable as children approach age 3. Therefore, it may be that a gender difference in inhibitory control was not present in the current study because of participants' young age.

There was also a positive relationship between attending daycare and children's sharing. Other researchers have also found a positive effect of daycare attendance on toddlers' prosocial behavior, arguing that daycare can allow toddlers to learn to offer sophisticated prosocial behavior via rich social experiences with peers (Schuhmacher, Collard, Kärtner, 2015).

It is also important to consider the relationship between race/ethnicity and maternal autonomy support. There was a positive correlation between these two variables; mothers who were White showed higher levels of autonomy support than parents who were not White, but it is imperative to consider this finding in the context of families' cultural norms, values, and beliefs. Cultural norms likely play a large role in predicting the impact of maternal autonomy support, and there is reason to believe that maternal autonomy support is not an equally effective method of socialization for all families. For example, Ispa and colleagues (2004) find that although African American mothers and Mexican American mothers showed higher levels of intrusiveness when interacting with their toddlers than White mothers, the effect of intrusiveness depended upon families' race/ethnicity. In African American families, maternal intrusiveness did not affect mother-child relationship quality, and was only linked to negative outcomes when mothers were also low in warmth. However, in White families, maternal intrusiveness was related to poor mother-child relationship quality, including children's

unwillingness to engage with mothers. Ispa and colleagues also found that acculturation played a large role for Mexican American families; in families who were less acculturated, intrusiveness was not related to negative parent-child outcomes, but intrusiveness was related to poorer mother-child relationship quality in families who were more acculturated. Ispa and colleagues argue that these findings illustrate the importance of the norms surrounding this type of parenting. In African American and less acculturated Mexican American families, intrusiveness may communicate love and concern to children, whereas White children may construe this type of parenting as overly controlling, restrictive, and negative. Higher levels of intrusiveness in families who are of racial and ethnic minorities may also be rooted in mothers' desire to convey important cultural values such as respect for family and community (Carlson & Harwood, 2003). Therefore, while autonomy support was positively associated with toddlers' regulatory skills in the current study's predominantly White sample, this may not be an effective parenting strategy within families of other backgrounds, who may convey their support by different means.

Contributions and Implications

This study makes a few unique contributions to the study of parenting, temperament, and early prosocial behavior. First, this study joins a small group of studies to investigate predictors of individual differences in the earliest forms of prosocial behavior. This study found that a specific type of prosocial behavior, sharing, is indirectly related to parenting through temperament. This is a novel finding in the study of early prosocial behaviors. The current study also stands out in its examination of children's inhibitory control as an independent construct, whereas in previous research inhibitory

control is often combined with other measures of regulation, giving a more vague idea of the components of temperament that relate to children's behaviors (e.g., Aguiar-Pardo, Martinez, Colmenare, 2013; Blake et al., 2015; Kochanska et al., 2000). Measuring a specific component of temperament, as well as separate forms of prosocial behavior, gives a sharper understanding of the specific skills related to different types of prosocial action. Future models explaining the development of prosocial behavior should differ based upon the specific prosocial behavior of interest.

Importantly, because this study points to predictors of individual differences in toddler's willingness to share, it contributes to our understanding of the foundations to prosocial behaviors. Although, as Warneken and Tomasello (2006; 2009) suggest, the root of helping and sharing is likely biological, the biological impulse to engage in these types of behaviors is impacted, at least indirectly, by factors in children's environment, as well as factors specific to children themselves (which can in turn be shaped by their environment). The current study suggests that it may be vital to examine indirect effects in order to understand how the complex interplay between parenting and children's characteristics relate to individual differences in specific types of prosocial behavior.

Furthermore, the association between maternal autonomy support and children's inhibitory control adds to the existing literature emphasizing that temperament and behaviors linked to temperament are not fixed but rather can change in response to the environment (Goldsmith, Buss, & Lemery, 1997; Hastings et al., 2008; Hughes & Ensor, 2009; Landry et al., 2002). These types of findings could have practical implications for parents, caregivers, and teachers. The findings of the current study suggest that adopting child-rearing strategies that are low in control, but high in support, responsiveness, and

flexibility may contribute to children's sense of control over their own behavior, and may then lead children to inhibit their own automatic responses when these responses are inappropriate. Thus, the idea that children's characteristics can be shaped by their environment and in turn lead to more positive social behaviors could be impactful for children and those who care for them.

Limitations

There are a few important limitations to keep in mind when interpreting the results of the current study. First, the study consisted of a small sample of mother-child dyads that were largely European American. On average, mothers were highly educated. Therefore, care must be taken not to overgeneralize these results to populations that are more ethnically, racially, and economically diverse.

Furthermore, given that the data are cross-sectional rather than longitudinal, it is important to acknowledge that the direction of effects in these findings cannot be determined. Although autonomy support and inhibitory control are positively related, one must consider that children's inhibitory control may elicit autonomy support from parents, rather than parenting facilitating this temperamental trait in children. The coding scheme used to capture autonomy support attempted to account for the effect of children's behavior on mothers by giving mothers credit for supportive behavior, regardless of their child's behavior. In other words, a mother could receive the top score for autonomy support even if her child was unfocused the entire task. She could do things such as reflect back the child's feelings, move the puzzle to a place the child was more comfortable, or attempt different strategies for reengaging her child. Thus, mothers' autonomy support scores were not necessarily penalized if her child was off task and did

not complete the puzzle. Furthermore, there was no association between maternal autonomy support and mothers reports of children's inhibitory control, suggesting that mothers' explicit ideas about their children's regulatory skills were not impacting their behaviors. Despite this, it could still be the case that children's behavior plays a role in the response they receive from parents. Rather than this being a unidirectional relationship in either direction, I would argue that the relationship between maternal autonomy support and children's inhibitory control could be bidirectional. In other words, mothers' behavior likely influences children's behavior and visa versa. Bell (1968) suggested that parenting behaviors are not always consistent but rather change in reaction to their child's characteristics and behaviors. Belsky (1984) also argued that parenting behaviors are influenced by many factors including parents' own personalities, their own well being, and their child's own characteristics, such as their temperament. Researchers who have examined this theory empirically have focused largely on the relationship between children's negative behaviors and harsh parenting (e.g. Burke, Pardini, Loeber, 2008; Del Vecchio & Rhodes, 2010). Limited work has examined how children's positive behaviors influence parenting and visa versa (see Newton, Laible, Carlo, & Steele, 2014 for an exception), and the work examining the relationship between children's inhibitory control and parenting reveals that this relationship may be complex. For example, Eisenberg and colleagues (2005) found that children's effortful control, measured when children were ages 7 to 12, was not predictive of subsequent parenting sensitivity 2 or 4 years later. However, Eisenberg, Taylor, Widaman, and Spinrad (2015) found that children's effortful control at 30 and 42 months is predictive of lower levels of subsequent negative parenting, specifically, maternal intrusiveness. Therefore, it may be

that children's inhibitory control is linked to the absence of negative parenting rather than the presence of positive parenting in bidirectional models. This is an area of research that needs further attention, especially in younger age groups including toddlers.

Future Directions

There are many avenues for future research based off the findings of this study. First, future research could identify the variety of contexts in which maternal autonomy support could take place and determine if the skills children learn through maternal autonomy support are dependent upon the context in which autonomy support is offered. Researchers should also examine the extent to which mothers' autonomy supportive behavior is stable across contexts. For example, a mother who offers high levels of support during a puzzle task may offer less support during a discussion about emotions if the mother has negative attitudes toward emotional expressivity, and this types of context-dependent support may relate differently to a variety of positive and negative social outcomes for children (such as good problem solving abilities but poorer regulation strategies). Alternatively, to eliminate variability in mothers' autonomy support for specific tasks, research could be conducted using experimental, rather than correlational designs. Mothers could be trained to provide their children with autonomy supportive instruction on a task that is closely related to an outcome measure. Afterward, children could perform the task independently, and researchers could compare their performance to children who did not receive autonomy supportive instruction. Along these same lines, it would also be important to investigate the effect of the person who provides autonomy support to children. It is likely that a close, warm relationship is important for socializing positive outcomes (Grusec & Goodnow 1994), but individuals such as teachers or

caregivers may be able to provide effective autonomy support to children if a warm relationship is present.

The study of autonomy support could also be extended by studying ways in which mothers fail to provide support to their children and how these aspects of parenting relate to children's outcomes. Whipple and colleagues (2011) have described failures to engage in autonomy supportive parenting as either "controlling" (parents complete tasks for their children, making children feel incapable of completing tasks on their own) or "hands-off" (parents fail to intervene or help their children even when their children expresses need). Whipple and colleagues collapsed these measures into an overall measure of parenting. However, there is reason to predict that both controlling and hands-off styles would be differentially related to outcomes in children. Controlling and intrusive parenting does not give children the opportunity to develop their own skills, and may be over-arousing for children, impeding the development of effective self-regulation strategies. Previous research illustrates these links; for example, parental intrusive control at age 4 is related to poorer physiological regulation at age 6 and internalizing issues, such as behavior withdrawal or depression, at age 8 (Rudd, Alkon, & Yates, 2017). A similar pattern can be observed in toddlers, in that intrusive parenting at 18 and 30 months is also related to poorer effortful control as children approach age 4 (Taylor, Eisenberg, Spinrad, & Widaman, 2013). Future work could thus examine if controlling parenting negatively predicts children's prosocial behavior through poorer regulatory abilities.

Alternatively, parenting that is hands-off, or low in support, may be directly and negatively related to prosocial behavior in children. Parental support plays an important role in socializing prosocial behavior. Parents reinforce positive behaviors, and children

perceive their interactions with their parents as positive, leading children to develop adaptive social orientations (Pettit, Harrist, Bates, & Dodge, 1991). Researchers have found that mothers who interact with their 4-year-old children in a supportive manner have children who demonstrate more prosocial behavior and less aggressive behavior at grade 3 (Laible et al., 2016). During adolescence, low maternal support is associated with aggression, while high support is associated with prosocial behavior (Carlo, Roesch, & Melby, 1998). Limited research has studied this relationship in toddlers, but in two notable exceptions, mothers who responded contingently to their toddlers during free play had children more likely to express concern toward a person in need (Spinrad & Stifter, 2006). In another study, mothers received instruction in providing supportive guidance to 2 and 3-year-olds, and researchers found that increases in mothers' support after the intervention were associated with decreases in toddler's aggressive behavior toward peers, but were not associated with prosocial behavior toward peers (Christopher, Saunders, Jacobwitz, Burton, & Hazen, 2013). It may be that over a longer intervention, prosocial behavior would have also increased, and more research is needed to understand the link between low maternal support and toddlers' social behaviors.

Future research should also examine how other aspects of parenting interact with autonomy support. The emotion and warmth that parents express in the context of providing autonomy support may be an important factor to consider. Parental warmth can be described as expressions of positive affect and affection toward the child, as well as indications that the parent enjoys interacting with the child (Davidov & Grusec, 2006). This type of parenting is thought to set a positive example of emotion regulation for children, as well as elicit positive emotions in children, thus facilitating willingness in

children to comply with their parents' expectations (Davidov & Grusec, 2006). Maternal warmth has been linked to both children's regulatory abilities (Von Suchodoletz, Trommsdorff, & Heikamp, 2011) and prosocial behaviors (Carlo, Mestre, Samper, Tur, & Armenta, 2010; Newton et al., 2014). Ispa and colleagues (2004) have found evidence that maternal intrusiveness and warmth interact, such that high levels of parental intrusiveness and low levels of parental warmth relate to greater subsequent child negativity toward parents, but this pattern was not observed when both intrusiveness and warmth were high. Thus, parental warmth may buffer against the effects of parental intrusiveness, such that children with intrusive, yet warm parents may still show positive social outcomes. Warmth may also increase the effectiveness of maternal autonomy support because the positive affect that characterizes the parent-child dyad may lead children to readily internalize parental values.

Furthermore, there are likely aspects of children's behavior that interact with maternal autonomy support. Although the current study examined children's inhibitory control, other components of toddlers' temperament may also relate to early prosocial behaviors, such as aspects of negative emotionality, including fear. Fear is described as the tendency to respond negatively to stimuli that are perceived as threatening or overly arousing, leading to behavioral inhibition (Rothbart & Bates, 2006). Thus, fearful children may be more likely to experience high levels of distress when faced with a person in need, and may therefore be less likely to engage in prosocial behavior (Liew et al., 2011). The work that has examined the relationship between fear and prosocial behavior has been mixed. Gross and colleagues (2015) found no relationship between fear and prosocial behavior at 18 to 30-month-olds, nor did Spinrad and Stifter (2006). In

contrast, Liew and colleagues (2011) found that fearfulness at 18 months is negatively related to helping a person in emotional distress at 30 months old. There is evidence, however, that the interaction of parenting and children's fearfulness may better predict aspects of social development. Rubin, Burgess, and Hastings (2002) found that only when mothers were highly controlling and children showed high levels of behavioral inhibition at age 2, were children likely to be socially withdrawn from peers at age 4. This type of controlling parenting likely does not allow children to feel that they can act competently in social situations and may even deprive children of practicing and improving their own social skills (Rubin, et al., 2002). Similar patterns have been found in studies of attachment security and children's fearfulness; toddlers who had insecure attachment styles and were highly fearful at 16 months were less likely to demonstrate empathic concern for a person in need at 22 months (van der Mark, van Ilzendoorn, & Bakersmans-Kranenburg, 2002). Future research could extend this research by examining the relationship between autonomy supportive parenting and children's fearfulness. It may be that autonomy supportive parenting fosters regulatory skills in children who are highly fearful, leading fearful children to act just as prosocially as children low in fearfulness. If parents are low in autonomy support, fearful children may be less likely to learn regulation strategies, and their developing social skills, including prosocial behavior, may suffer.

Conclusions

The current study adds to the wealth of recent literature demonstrating that by their second birthday, toddlers engage in prosocial behavior on behalf of individuals they only recently met. However, this study is also novel in that it seeks to capture the process

by which prosocial behavior develops. The current study finds a positive relationship between observations of maternal autonomy support and children's inhibitory control. In turn, children's inhibitory control is positively associated with two distinct types of prosocial behavior: empathic helping and sharing. Furthermore, inhibitory control accounts for the indirect link between maternal autonomy support and toddlers' sharing. These results are the first to demonstrate a link between inhibitory control and nascent prosocial behaviors.

These results also suggest that via children's temperament, toddlers' drive to help others can be shaped by their environment. Parents can engage in behaviors to help their children foster the skills they need to engage prosocially with others, and perhaps put children on a path to grow into more prosocial adolescents and adults. The current study also emphasizes that researchers must be careful to consider how parenting and temperament impact specific types of prosocial behavior. Because each type of prosocial behavior likely requires different skills and motivations, understanding what makes some children very prosocial, while others are not, is a complex puzzle that developmental psychologists have only begun to solve.

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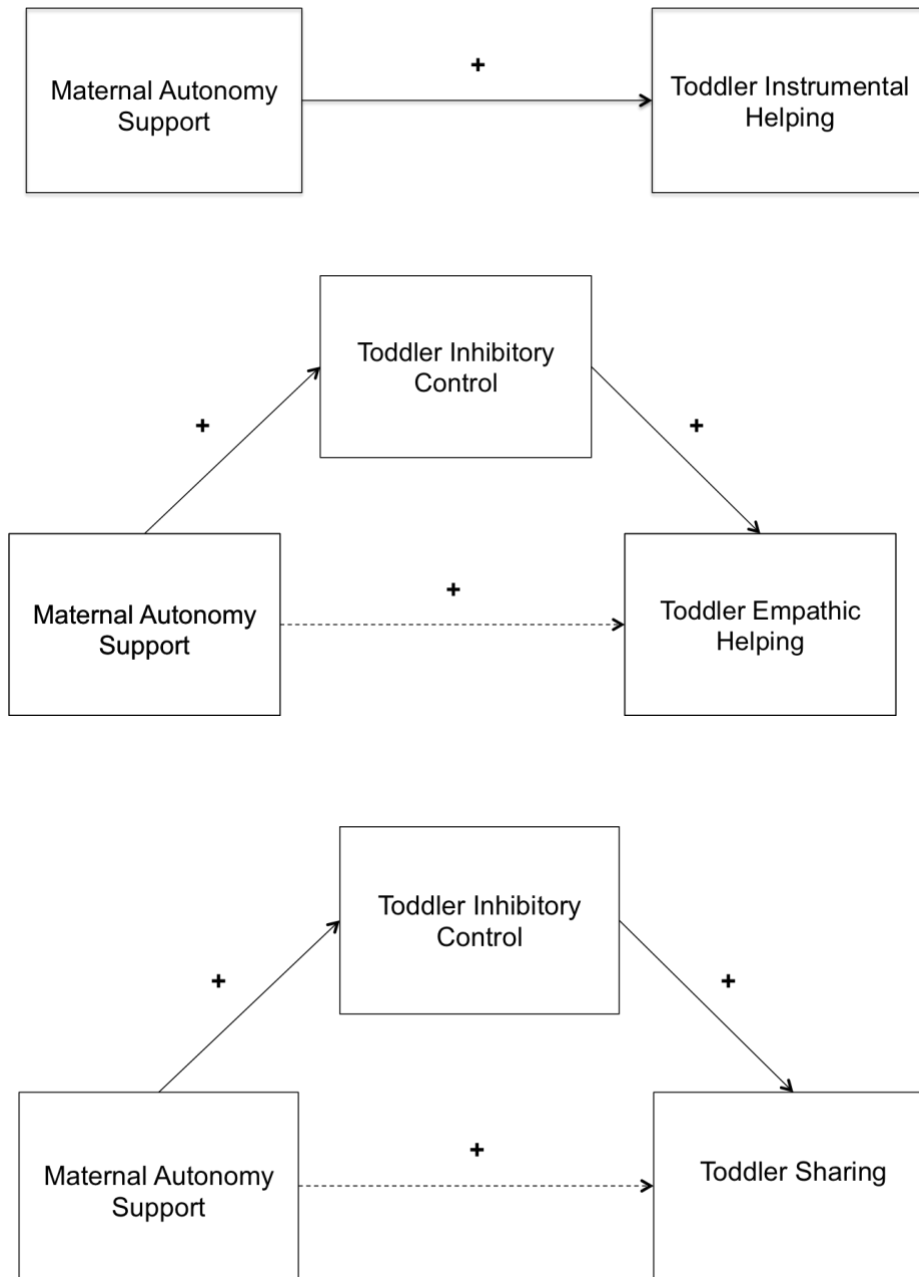
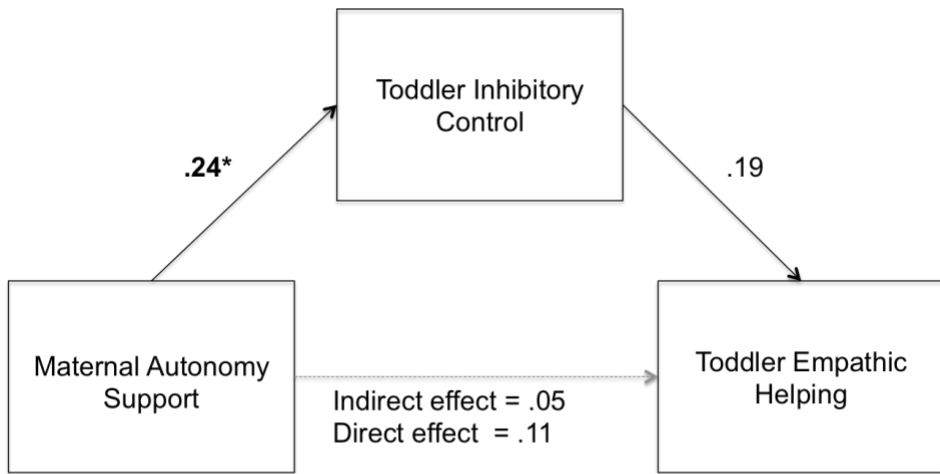


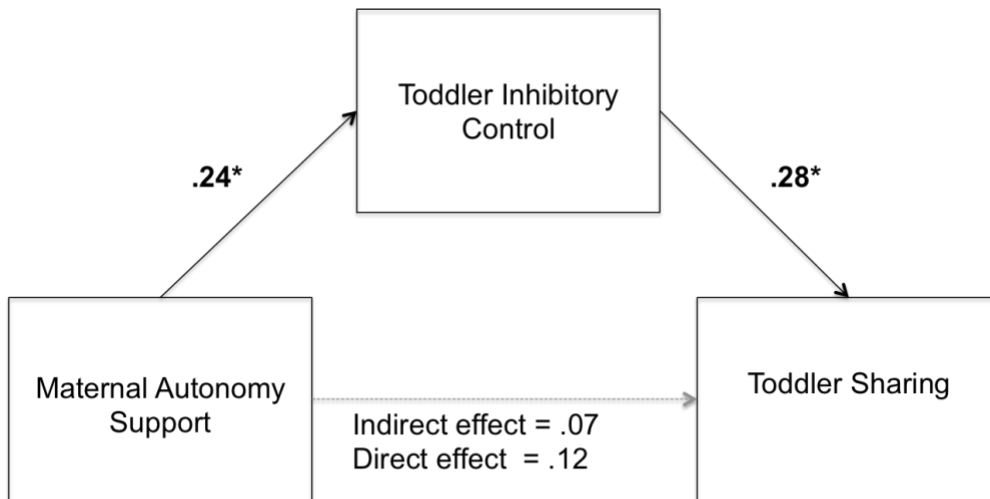
Figure 1. Models depict the predicted relationships between maternal autonomy support, children’s inhibitory control, and children’s prosocial behaviors. Only autonomy support is predicted to relate to instrumental helping, while inhibitory control is predicted to mediate the positive association between autonomy support and empathic helping, as well as sharing.



Bias-corrected bootstrap (n=5,000): 95% CI (-.01, .06)

Figure 2. Mediation model demonstrating there is no indirect effect of autonomy support on toddlers' empathic helping.

*p < .05



Bias-corrected bootstrap (n=5,000): 95% CI (.0003, .07)

Figure 3. Mediation model depicting the indirect effect of maternal autonomy support on toddlers' sharing through toddlers' inhibitory control.

*p < .05

Table 1.
Descriptive Statistics

Variable	Mean	Standard Deviation	Possible Range
Maternal Autonomy Support	2.86	.93	1 to 5
GT No Peeking	.62	.30	0 to 1
GT Disengagement	.09	.29	0 to 1
GT Sitting	.54	.44	0 to 1
GT No Touch	.95	.12	.5 to 1
SD Total Seconds Waited	61.86	18.71	15 to 75
ECBQ Inhibitory Control	4.08	.90	2 to 6
Instrumental Help Proportion	.56	.33	0 to 1
Empathic Help Proportion	.56	.41	0 to 1
Sharing Proportion	.73	.33	0 to 1
Instrumental Help Mean Cue	1.41	.93	0 to 3
Empathic Help Mean Cue	1.40	1.40	0 to 5
Sharing Mean Cue	1.77	1.05	0 to 4

Note. GT = Gift Task, SD = Snack Delay

Table 2.
Bivariate Correlations, Including Proportion Scores for Prosocial Tasks

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Child Gender	-	-.10	.12	.02	-.13	-.15	-.09	-.23*	.10	.10	-.05	.18	.14	.17	.04
2. Child Ethnicity		-	-.01	.03	.18	.27*	.11	-.09	.13	.32**	.22+	.04	-.09	.15	-.05
3. Child Attends Daycare			-	.03	.28*	.02	-.02	-.07	.17	-.02	.16	.05	.28*	.15	.34**
4. Mother Age				-	.27*	.16	.34**	.14	.05	.26*	.08	-.16	-.14	-.04	-.23*
5. Mother Education					-	.24*	.25*	.09	.15	.21+	.12	.12	-.06	.22+	.26*
6. Autonomy Support						-	.30**	-.13	.20+	.16	.30*	.12	-.03	.20+	.09
7. GT No Peeking							-	.20+	.45**	.25*	.31*	.22+	-.23+	.05	-.09
8. GT Disengagement								-	-.41**	-.09	-.01	-.32**	.06	-.18	-.23*
9. GT Sitting									-	.21+	.43**	.41**	.07	.25*	.29*
10. GT No Touch										-	.20+	.03	-.13	.08	-.07
11. SD Total Seconds Waited											-	.32**	.03	.17	.25*
12. ECBQ Inhibitory Control												-	.09	.16	.36**
13. Instrumental Help Proportion													-	.51**	.45**
14. Empathic Help Proportion														-	.37**
15. Sharing Proportion															-

Note. GT = Gift Task, SD = Snack Delay. + $p < .1$, * $p < .05$, ** $p < .01$

Table 3.
Bivariate Correlations, Including Mean Cue Scores for Prosocial Tasks

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Child Gender	-	-.10	.12	.02	-.13	-.15	-.09	-.23*	.10	.10	-.05	.18	.13	.16	.18
2. Child Ethnicity		-	-.01	.03	.18	.27*	.11	-.09	.13	.32**	.22 ⁺	.04	-.08	.14	-.12
3. Child Attends Daycare			-	.03	.28*	.02	-.02	-.07	.17	-.02	.16	.05	.26*	.18	.32**
4. Mother Age				-	.27*	.16	.34**	.14	.05	.26*	.08	-.16	-.21 ⁺	-.08	-.10
5. Mother Education					-	.24*	.25*	.09	.15	.21 ⁺	.12	.12	-.05	.22 ⁺	.20 ⁺
6. Autonomy Support						-	.30**	-.13	.20 ⁺	.16	.30*	.12	-.03	.19 ⁺	.08
7. GT No Peeking							-	.20 ⁺	.45**	.25*	.31*	.22 ⁺	-.24*	.02	-.05
8. GT Disengagement								-	-.41**	-.09	-.01	-.32**	.04	-.18	-.11
9. GT Sitting									-	.21 ⁺	.43**	.41**	.05	.26*	.20 ⁺
10. GT No Touch										-	.20 ⁺	.03	-.12	.01	.07
11. SD Total Seconds Waited											-	.32**	.05	.15	.11
12. ECBQ Inhibitory Control												-	.13	.18	.15
13. Instrumental Help Cue Score													-	.55**	.51**
14. Empathic Help Cue Score														-	.42**
15. Sharing Cue Score															-

Note. GT = Gift Task, SD = Snack Delay, ⁺ $p < .1$, * $p < .05$, ** $p < .01$

Table 4.
Bivariate Correlations with Composite Observed Inhibitory Control Variable

	1	2	3	4	5	6	7	8	9	10
1. Observed Inhibitory Control	-	.13	.27*	.12	.10	.20 ⁺	.34*	-.06	.26*	.26*
2. Child Gender	-	-	-.10	.12	.02	-.13	-.15	.15	.17	.04
3. Child Ethnicity			-	-.01	.03	.18	.27*	-.09	.15	-.05
4. Child Attends Daycare				-	.03	.28*	.02	.28*	.15	.34**
5. Mother Age					-	.27*	.16	-.14	-.04	-.23 ⁺
6. Mother Education						-	.24*	-.06	.23	.26*
7. Maternal Autonomy Support							-	-.03	.20 ⁺	.09
8. Instrumental Help Proportion								-	.51**	.43**
9. Empathic Help Proportion									-	.42**
10. Sharing Proportion										-

Appendix A

Autonomy Support Coding Scheme (Whipple, Bernier, & Mageau, 2011)

5 – Highly Autonomy Supportive

- Mother intervenes when her child struggles with the puzzle and does so promptly. Mother does not intervene before the child starts to struggle.
 - Mother intervenes by organizing and adapting the puzzle so that it presents an optimal challenge for the child. In other words, the mother organizes the puzzle to fit the child's skill level.
 - Mother provides the child with the opportunity to make choices (for example, she lets the child pick which piece to do first). She structures the task in a way that allows the child to play an active role in completing the puzzle. The mother does not complete the task for the child.
- Mother respects the pace at which the child can complete the task (i.e., the mother does not intervene just to speed up the process).

4 – Almost always autonomy supportive

- There are instances in which the mother fails to be autonomy supportive. However, these instances are the exception in an otherwise highly autonomy supportive interaction. Examples of failures to be autonomy supportive include:
 - Mother may intervene when the child does not need help or mother fails to intervene when the child struggles
 - Mother may complete parts of the task for the child without allowing the child choices or allowing the child to play an active role in the action
 - Mother may appear that she is “rushing” the child

3 – Moderately Autonomy Supportive

- Mother intervenes when her child needs help and does so at the appropriate time, but fails to adapt the task for the child so that it becomes optimally challenging. OR the mother adapts the task so that it becomes optimally challenging for the child, but does so before the child needs help or does so after the child has been struggling for some time.
- About half the time, the mother fails to do at least one of the following:
 - Respect child's pace
 - Intervene when the child needs help or structure
 - Allow the child to make choices
 - Allow the child to act on his or her own
 - OR the mother fails to do a combination of these things intermittently (i.e., there is a significant portion of the interaction in which the child is not the actor)

2 – Little Autonomy Support

- Mother engages in a few actions that support the child's autonomy, however, the majority of the interaction can be classified as not autonomy supportive.

- During the majority of the clip, the mother fails to:
 - Respect child's pace
 - Intervene when the child needs help or structure
 - Allow the child to make choices
 - Allows the child to act on his or her own

1 – Not Autonomy Supportive

- Mother does not intervene when her child needs help, or she intervenes before her child needs help
- Mother does not adapt the task to make it more optimally challenging for the child.
- Mother does not respect child's pace and/or does not allow the child to make choices when she intervenes
- A score of 1 reflects a mother who completes the entire puzzle herself OR a mother who never helps the child

Note: intervening or adapting the task includes verbalizations, such as providing the child with hints, suggestions, or instructions.

Appendix B

Early Childhood Behavior Questionnaire Short Form Inhibitory Control Scale (Putnam, Jacobs, Garstein, & Rothbart, 2010)

As you read each description of behavior below, please indicate how often your child did this during the last two weeks by circling one of the numbers in the right column. These numbers indicate how often you observed the behavior described during the last two weeks.

1	2	3	4	5	6	7	NA
Never	Very Rarely	Less than half the time	About half the time	More than half the time	Almost Always	Always	Does not apply

The “Does Not Apply” column (NA) is used when you did not see the child in the situation described during the last two weeks.

1. When asked NOT to, how often did your child touch an attractive item (such as an ornament) anyway?
2. When told “no”, how often did your child stop the forbidden activity?
3. When asked to wait for a desirable item (such as ice cream), how often did your child go after it anyway?
4. When asked to wait for a desirable item (such as ice cream), how often did your child wait patiently?
5. When asked to do so, how often was your child able to stop an ongoing activity?
6. When asked to do so, how often was your child able to be careful with something breakable?

Vita

Erin L. Karahuta

DEVELOPMENTAL PSYCHOLOGIST

- Extensive experience collecting and analyzing observational data from children and families
- Skill in managing teams of researchers and coordinating between researchers and institutions
- Specific training in investigating predictors of positive social outcomes in children

EDUCATION

Lehigh University, Bethlehem, PA
Ph.D., Psychology, Concentration in Child Development January, 2019
M.S., Psychology, Concentration in Child Development May, 2014

University of Pittsburgh, Pittsburgh, PA
B.S., Psychology April, 2012
B.A., German April, 2012

RESEARCH SKILLS

Emotional Development Lab, Lehigh University Aug. 2012 - Present

- 6 years of experience researching children and families using a variety of methodologies.
- Developed and implemented 5 research protocols.
- Created coding schemes, evaluated validity and reliability of research procedures, and analyzed data for 7 research projects, resulting in 21 conference presentations and 1 published article.
- Lab manager, oversaw an NIH Grant:
 - Supervised, trained, and mentored teams of 10-15 researchers and collaborated with out-of-state teams.
 - Developed methodology for assessing mother-child relational quality in 650 ethnically diverse, low SES families.

TEACHING EXPERIENCE

Lehigh University Aug. 2012 – May 2017

- Independently taught and developed course materials and assessments for 3 college-level courses.
- Supported instructors of 10 courses by leading course discussions, overseeing course projects, lecturing, and managing evaluations of courses of up to 150 students.
- Presented complex research topics to novice learners.

- Mentored advanced students one-on-one to develop and implement research projects.

CHILD DEVELOPMENT EXPERTISE

Psychology Department, Lehigh University Aug. 2012 - Present

- 6 years of intensive training in how to employ research methods to implement effective strategies for supporting children's well being.
- Personally worked with over 400 parents and children 2 to 16 years old who took part in research.
- Completed graduate coursework and taught 2 undergraduate courses emphasizing the importance of the interaction of environmental contexts in shaping child development.

University Child Development Center, University of Pittsburgh Sept. 2010 – Aug. 2012

- 2 years caring for children in a preschool classroom

ADDITIONAL EXPERIENCE

- 2 years reviewing the ethics of human subjects research as a member of Lehigh University's Institutional Review Board.
- Organized outreach events to share research findings with families in the community and Lehigh University alumni.
- Graduate Student Representative to the Graduate and Research Committee.

PUBLICATIONS

Laible, D., **Karahuta, E.**, Van Norden, C., Interra, V., & Stout, W. (in press). The socialization of children's moral understanding in the context of every day discourse. In D. Laible, G. Carlo, & L. Padilla-Walker (Eds), *Handbook of moral development and parenting, Oxford Library of Psychology Series*. Oxford, UK: Oxford University Press.

Laible, D., **Karahuta, E.**, Stout, W., Van Norden, C., & Interra, V. (in press). Socialization in the context of parent-child relationships. In J. Stein (Ed.), *Reference Module in Neuroscience and Biobehavioral Psychology*. New York, NY: Elsevier, Inc.

Laible, D., **Karahuta, E.**, Van Norden, C., & Stout, W. (2018). Close relationships. In M. Bornstein (Ed.), *The SAGE Encyclopedia of Lifespan Human Development*. New York, NY: Sage Publications, Inc.

Laible, D., Van Norden, C., **Karahuta, E.**, & Stout, W. (2017). Children's social-emotional development. In K. L. Nedal (Ed.), *The SAGE Encyclopedia of Psychology and Gender*. New York, NY: Sage Publications, Inc. 10.4135/9781483384269.n

Laible, D. L. Carlo, G., Davis, A., & **Karahuta, E.** (2016). Parental sensitivity and effortful control in early childhood as predictors of adolescents' adjustment: The

mediating roles of peer group affiliation and social behaviors. *Developmental Psychology*.

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Pettygrove, D. M., Hammond, S. I., **Karahuta, E., L.**, Waugh, W. E., & Brownell, C. A. (2013). From cleaning up to helping out: Parental socialization and children's early prosocial behavior. *Infant Behavior and Development*, 36 (4), 843-846.

PRESENTATIONS

Karahuta, E., Laible, D., Eberly Lewis, M., van Norden, C., Conover, O., Pierotti, S., & Carlo, G. (2018, April). *Promoting Adolescent Disclosure through Mother-Adolescent Disclosure*. Poster presented at the biennial meeting of the Society for Research on Adolescents, Minneapolis, MN.

Eberly Lewis, M., Bede, Laura, A., Laible, D., van Norden, C., **Karahuta, E.**, & Franz, S., Pierotti, S., & Carlo, G. (2018, April). Revelations of Adolescents' and Mothers' Reasons for and against Volunteering through Discourse. Poster presented at the biennial meeting of the Society for Research on Adolescents, Minneapolis, MN.

Laible, D., Pierotti, S., van Norden, C., **Karahuta, E.**, & Eberly Lewis, M. (2018, April). The Longitudinal Links between Friendship Quality and Prosocial Behavior. Poster presented at the biennial meeting of the Society for Research on Adolescents, Minneapolis, MN.

Laible, D., **Karahuta, E.**, Pierotti, S., Eberly Lewis, M., & van Norden, C. (2018, April). Mothers' Mental Health and Children's Problem Behavior at Grade 5: The Mediating Roles of Parenting and Self Regulation. Poster presented at the biennial meeting of the Society for Research on Adolescents, Minneapolis, MN.

Pierotti, S., Laible, D., Eberly Lewis, M., **Karahuta, E.**, & van Norden, C. (2018, April). Profiles of Adolescents' Moral Motivations: Relations to Ingroup and Outgroup Prosocial and Aggressive Behavior. Poster presented at the biennial meeting of the Society for Research on Adolescents, Minneapolis, MN.

Karahuta, E., & Laible, D., Children's Prosocial Behavior and Self Regulation – Examining Directionality (2017, April). Poster presented at the Society for Research on Child Development Biennial Meeting, Austin, TX.

Karahuta, E. & Laible, D., The Role of Autonomy Support and Effortful Control in Predicting Prosocial Behavior (2017, April). Poster presented at the Society for Research on Child Development Biennial Meeting, Austin, TX.

Laible, D., Conover, O., **Karahuta, E.**, Lewis, M., Carlo, G. Adolescent Discourse quality in mother-adolescent exclusion discussions: Links with social adjustment (2017, April) In E. Hernandez (Chair), New ways to measure Discourse: Examining Narratives about past events in early childhood, adolescence, and adulthood. Symposium conducted at the Society for Research on Child Development Biennial Meeting, Austin, TX.

Karahuta, E., & Laible, D., The Role of Autonomy Support and Effortful Control on Children's Prosocial Behavior (2016, November). Poster presented at the BYU Symposium on Family and Human Development, Provo, UT.

Karahuta, E., & Laible, D. J., Longitudinal Relationship of Positive Child Engagement and Mothers use of Corporal Punishment (2016, May). Poster presented at the Association for Psychological Science Annual Convention, Chicago, IL.

Karahuta, E., Laible, D. J., Eberly Lewis., M. B., van Norden, C., Pierotti, S. L., Carlo, G., McClain, D., Taylor, S., & Fike., K. (2016, April). Parenting Links with Adolescent Moral Disengagement. Poster presented at biennial meeting of the Society for Research on Adolescence, Baltimore, MD.

Laible, D. J., **Karahuta, E.**, & van Norden, C., Positive and negative peer group association: Links with parental autonomy and adolescent monitoring. (2016, April). Poster presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.

Laible, D. J., Eberly Lewis., M. B., **Karahuta, E.**, van Norden, C., McClain, D., Taylor, S., Fike., K., Pierotti, S. L., & Carlo, G. (2016, April). Adolescent-mother disengagement in conversations about victimization: Links with moral development. In M. B. Eberly Lewis (Chair), The Importance of Mother-Adolescent Discourse in the Development of Adolescent Morality. Symposium conducted at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.

Pierotti, S. L., Laible, D. J., Eberly Lewis, M. B., van Norden, C., **Karahuta, E.**, Carlo, G., McClain, D., Taylor, S. R., & Fike, K. J. (2016, April). The role of children's and mothers' disengagement in children's prosocial behavior towards friends and strangers. Poster presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.

van Norden, C., Laible, D. J., Eberly Lewis., M. B., **Karahuta, E.**, Carlo, G., ., Pierotti, S. L., McClain, D., Taylor, S., & Fike., K (2016, April). Effortful and Inhibitory Control Predicting Different Types of Moral Reasoning in Adolescents. Poster presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.

Karahuta, E., & Cerce, S., (2015, May) Child Engagement and Maternal Discipline – A Bidirectional Relationship. Poster presented at the Association for Psychological Science Annual Convention, New York, NY.

Laible, D. L., **Karahuta, E.**, & Carlo, G. (2015, March). The Links Between Children's Peer Group Affiliation and Prosocial Behavior in Elementary School. In L. van Rijsewijk (Chair), The Role of Peers and Friends in the Development of (Early) Adolescents' Prosocial Behaviors and Relations. Symposium conducted at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Karahuta, E., Laible, D. L., Pierotti, S. L., Eberly Lewis., M. B., Carlo, G., & Fromison, J. (2015, March) Mothers and Adolescents use more Moral Reasoning when Discussing Ingroup Victims. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Karahuta, E., Pierotti, S. L., Laible, D. L., Eberly Lewis., M. B., Carlo, G., & Fromison, J. (2015, March) Mothers' Moral Identity and Moral Regard: Links with Adolescent Socio-Emotional Outcomes. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Laible, D., **Karahuta, E.**, Peirotti, S., Eberly Lewis, M., Carlo, G., Froimson, J., (2015, March). The quality of mother-child moral discussions: Links with temperament, maternal personality, and adolescent moral outcomes. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Pierotti, S. L., Laible, D., Conejo, L.D., **Karahuta, E.**, Carlo, G., Eberly Lewis, M. B., & Froimson, J. (2015, March). Moral predictors of adolescent prosocial behavior toward ingroup and outgroup members. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Karahuta E., Laible, D., & Froimson, J. (2014, March 20). Bidirectional effects of sensitive parenting and cooperation during childhood and adolescence. Poster presented at the biennial of the Society for Research on Adolescence, Austin, TX.

Laible, D., **Karahuta, E.**, Froimson, J., & Carlo G. (2014, March 20). Predicting adolescent aggressive, delinquent, and cooperative behavior from earlier peer group affiliation and social behavior. Poster presented at the biennial of the Society for Research on Adolescence, Austin, TX.

Froimson, J., Laible, D., & **Karahuta, E.** (2014, March 20). Links between empathy, guilt, and perspective taking and children's roles in bullying episodes. Poster presented at the biennial of the Society for Research on Adolescence, Austin, TX.

Laible, D., Froimson, J., **Karahuta, E.**, Murphy, T., Augustine, M. (2014, March 20). Predicting adolescent prosocial and aggressive behaviors: The roles of attachment and moral affect and cognition. Poster presented at the biennial of the Society for Research on Adolescence, Austin, TX.