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Learning to Repair Transgressions: Toddlers' Social Learning of a Reparative Prosocial Act

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LEARNING TO REPAIR TRANSGRESSIONS: TODDLERS' SOCIAL LEARNING OF A
REPARATIVE PROSOCIAL ACT

by

MEGHAN ROSE DONOHUE

Under the Direction of Erin C. Tully, PhD

ABSTRACT

This study investigated children's social learning of prosocial behaviors in a transgressor context. Two-to three-year-olds (24-47 months, $N = 54$) saw videos of an adult help another adult in distress by performing a novel prosocial action. Children were then led to believe that they had transgressed to cause their parent's pain and sadness. It was hypothesized that children in the experimental condition who watched the video and then transgressed would be more likely to perform the novel action (imitation) and to display non-demonstrated prosocial behaviors (goal emulation) relative to children in two control conditions: (a) children who did not view the video but transgressed and (b) children who viewed the video but witnessed a neutral interaction. Children in the experimental condition were no more likely to imitate or emulate than children in the control conditions, suggesting that children have difficulty applying socially learned prosocial behaviors in a transgressor context.

INDEX WORDS: Prosocial behaviors, Reparation, Social learning, Imitation, Goal emulation,
Transgressor context

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MEGHAN ROSE DONOHUE

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DEDICATION

This project is dedicated to my mother, the greatest model of selflessness and compassion a child could have.

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1 INTRODUCTION

Early childhood is a crucial period for developing the ability to recognize and respond adaptively to distress in others (Hay & Cook, 2007). Learning to behave prosocially is an important skill for young children to master, as these behaviors have been linked to competence in domains such as peer relationships and academic achievement (Denham & Holt, 1993; Eisenberg, Fabes, Karbon, et al., 1996; Warden & MacKinnon, 2003; Zahn-Waxler & Van Hulle, 2011) and are protective against later externalizing problems (Hastings, Zahn-Waxler, Robinson, Usher, & Bridges, 2000). Imitation and goal emulation are well-established social learning mechanisms through which toddlers learn new skills and connect socially with others (Over & Carpenter, 2012). Our previous work demonstrated that toddlers are able to learn a specific prosocial behavior and apply this behavior to help a parent in distress through imitation and goal emulation (Williamson, Donohue, & Tully, 2013). The purpose of the present study is to extend this research to children's social learning of a reparative prosocial behavior when the children believe they have transgressed to cause their parent's distress.

1.1 The Development of Empathy and Prosocial Behaviors in Early Childhood

Prosocial behaviors are voluntary *actions* that are helpful, affiliative, supportive and aimed at benefitting another person, such as comforting another in distress (Eisenberg & Fabes, 1998). Empathy is an *affective* response stemming from the apprehension or understanding of another's emotional state, and is similar to what the other person is thought to be feeling (Eisenberg, Spinrad, & Sadovsky, 2006). Empathy often motivates prosocial behaviors, but prosocial behaviors can occur without empathy and empathy does not always lead to prosocial behaviors (Eisenberg & Eggum, 2008). While empathy and prosocial behaviors are related constructs that can be distinguished conceptually, they are practically difficult to distinguish in

research contexts using behavioral paradigms.

Evidence that newborns respond to other infants' distress with contagious crying suggests a biological predisposition for empathy that is characterized by self-distress in early infancy (Dondi, Simion, & Caltran, 1999; Sagi & Hoffman, 1976). By 6 months of age, infants rarely respond to others' distress with self-distress (Hay, Nash, & Pedersen, 1981; Roth-Hanania, Davidov, & Zahn-Waxler, 2011), and instead look at or contact distressed peers, displaying *other-oriented* empathic concern (Hay et al., 1981). In one study, 8-month-olds responded to others' distress with concerned affect and attempts to understand the distress (e.g., by using vocalizations with a questioning tone); these displays of empathic concern increased over 8 to 16 months (Roth-Hanania et al., 2011). By toddlerhood, children frequently display emotional reactions indicative of empathy, such as facial, vocal and postural expressions of concern for victims of distress as well as concerned awareness of the victim (e.g., stopping activity and staring at the distressed, Spinrad & Stifter, 2006). Empathy continues to increase with age throughout childhood, aided by developments of children's perspective taking skills, theory of mind, and understanding of increasingly complex emotions (Eisenberg & Eggum, 2008; Eisenberg & Fabes, 1998).

Prosocial action involves initiating other-oriented *behavior*, which requires considerable self-regulation (Roth-Hanania et al., 2011). Throughout the second year of life, children's empathic concern becomes increasingly accompanied by prosocial behaviors directed toward victims of distress—both distress children have witnessed as *bystanders* as well as distress they have caused as *transgressors* (Zahn-Waxler, Radke-Yarrow, & King, 1979; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). Such behaviors include physical affection, helping (e.g., retrieving a bandaid), comforting statements, and apologies. Prosocial responses to distress

witnessed as a bystander are termed relationship-enhancing, or *altruistic* prosocial behaviors, as they function to promote or sustain relationships, whereas responses to distress caused as a transgressor are termed relationship-mending or *reparative* prosocial behaviors, as they function to repair or restore relationships (Estrada-Hollenbeck & Heatherton, 1998). Further, while empathy typically underlies altruistic behaviors, reparative behaviors are often motivated by interpersonal guilt, in which a child experiences empathy *and* an awareness of responsibility for the distress (Zahn-Waxler & Radke-Yarrow, 1990).

As toddlers learn social rules that guide behavior and become increasingly sensitive to situations in which prosocial behaviors are needed and desired, these behaviors in turn become more selective (for review, see: Hay & Cook, 2007). Over time, toddlers also gradually need less explicit distress cues in order to help victims, an ability that is likely due to parallel developments in understanding others' internal states (Svetlova, Nichols, & Brownell, 2010). This project focuses on 2- and 3-year-olds, as toddlerhood is a period of marked prosocial development, and children's emerging sensitivity to social rules governing behavior may facilitate their ability to learn prosocial behaviors through imitation and goal emulation. Further, while the literature on children's prosocial responses to others' distress has largely focused on responses to others' pain (Brownell, Svetlova, Anderson, Nichols, & Drummond, 2013), the current study examines children's social learning of prosocial behaviors to help another in pain and sadness.

1.2 The Socialization of Prosocial Behavior in Children

While it is well-established that learning to behave prosocially has implications for healthy development and that toddlers are capable of prosocial action, less is known about mechanisms that underlie prosocial learning. Children's prosocial development is influenced by

various factors, including personal characteristics of the child (e.g., temperament and empathic tendencies, Young, Fox, & Zahn-Waxler, 1999) as well as socialization practices, which are the focus of the current study. Although associations between various socialization practices and prosocial development are well-documented, this literature is largely correlational, and very few studies have examined practices that are associated with the development of specifically reparative prosocial behaviors. Our previous study, one of the few experimental investigations of the role of socialization practices in the development of prosocial behavior, supports the causal role of social learning mechanisms, specifically imitation and goal emulation, in children's acquisition of a specific prosocial behavior that children then applied in a bystander context. The current study sought to replicate and extend this finding by examining children's application of socially learned prosocial behaviors in a distinct, developmentally relevant social context – when children are transgressors.

Although prosocial behaviors are influenced by genetic factors, environmental influences are particularly influential during early childhood, when both nonshared and shared environmental factors exert considerable influence (Knafo & Israel, 2010; Knafo & Plomin, 2006; Scourfield, John, Martin, & McGuffin, 2004). For instance, one study reported a shared environmental effect of .43 and heritability of .22 on toddlers' helping behaviors when their mothers simulated distress (Volbrecht, Lemery-Chalfant, Aksan, Zahn-Waxler, & Goldsmith, 2007). While individual differences in prosocial responses to others' distress are evident in children as young as 14 months of age (Zahn-Waxler, Robinson, & Emde, 1992) they are not stable characteristics until children begin school, at which point they are predictive of later prosocial tendencies (Eisenberg et al., 1999; Hay & Pawlby, 2003). Together, these findings suggest that the toddlerhood is a prime age at which social mechanisms have influence.

Empirical evidence supports the role of socialization in children's development of prosocial behaviors, with studies finding associations between discipline practices, secure attachment and emotion teaching and children's increased prosocial responding. An authoritative parenting style has been associated with children's increased prosocial responding (Hastings, Rubin, & DeRose, 2005; Hastings et al., 2000) including greater reparative prosocial behaviors (Kochanska, 1991). Prosocial behavior is also associated with inductive reasoning, in which parents provide children with explanations about the needs of others and the effects of harmful acts (Dlugokinski & Firestone, 1974; Hoffman, 1963). One study found that mothers' use of inductive reasoning at 20-24 months predicted reparative prosocial behaviors 5 months later (Zahn-Waxler et al., 1979).

Moreover, secure early attachment to parents (Eisenberg & Fabes, 1998; Ianotti, Cummings, Pierrehumbert, Milano, & Zahn-Waxler, 1992; Kestenbaum, Farber, & Sroufe, 1989; Waters, Wippman, & Sroufe, 1979) and teachers (Howes, Matheson, & Hamilton, 1994) and mother's use of emotion socialization practices such as labeling, explaining and discussing children's emotions and supporting emotional expressivity (Eisenberg, Fabes, & Murphy, 1996; Eisenberg, Fabes, Schaller, Carlo, & Miller, 1991; Eisenberg, Wolchik, Goldberg, & Engel, 1992; Garner, 2003) predict children's increased prosocial responding. One study found that parents who more often asked their 18-to 30-month old toddlers to label and explain emotions had children who shared and helped more quickly and often than toddlers whose parents elicited less of their emotion talk (Brownell et al., 2013). Further, mothers' responsive, emotionally available caregiving in infancy is associated with toddlers' prosocial responses to distress in others (Kiang, Moreno, & Robinson, 2004; Moreno, Klute, & Robinson, 2008; Robinson, Zahn-Waxler, & Emde, 1994; Spinrad & Stifter, 2006; van der Mark, van IJzendoorn, & Bakermans-

Kranenburg, 2002; Zahn-Waxler et al., 1979). Indeed, in one study, maternal responsiveness at 9 months predicted prosocial responses to mother's distress at 22 months (Kochanska, Forman, & Coy, 1999).

While these studies demonstrate that prosocial behaviors are associated with socialization experiences even in toddler-age children, the investigations have been almost exclusively correlational; thus, it is unclear whether socialization practices play a causal role in prosocial development. Alternatively, children's individual differences in social and emotional competence may elicit specialized responses from socialization agents (i.e., parents facilitate social interactions for highly social children). A third variable may also mediate the association between socialization practices and prosocial behaviors; for example, genes for prosocial traits lead parents to facilitate their children's social development, while these same genes lead children to display more prosocial traits. Experimental designs that manipulate the social context are necessary to elucidate whether socialization practices cause greater prosocial responding, and information about causal mechanisms can inform interventions aimed at increasing prosocial behaviors.

To date, the few experimental studies on socialization practices have focused on direct instruction and reinforcement, neither of which appears to effect toddlers' prosocial responding. In one study, neither encouragement from a parent or experimenter nor an experimenter's direct orders increased 24-month-old children's rates of helping to pick up dropped objects relative to children who did not receive instruction (Warneken & Tomasello, 2013). In another study, children who initially received praise after helping hand out-of-reach objects to an experimenter did not help at a higher rate when the experimenter later needed help than children who had initially received neutral feedback after helping; further, children who initially received a reward

for helping displayed lower rates of subsequent helping relative to children who had initially received praise or neutral feedback (Warneken & Tomasello, 2008). These results suggest that children have intrinsic prosocial motivations that can be undermined by extrinsic rewards.

Modeling of prosocial behaviors by socialization agents may be an effective way to socialize these behaviors in toddlers. Socialization agents such as parents, teachers and peers may foster a child's prosocial behaviors by modeling concern for others; children themselves may be the recipient of such helpful actions, or children may also learn through witnessing a parent or peer model helpfulness toward another child or adult. Studies support that parent and peer models are effective in teaching children a wide variety of social skills such as social games, positive peer interactions, and initiating social bids (Green et al., 2013; Grosberg & Charlop, 2014; Odluyurt, 2013). Further, many of these studies include modeling alone without supplementing demonstrations with direct instruction. A naturalistic study found that mothers commonly modeled prosocial behaviors toward child victims of distress when in the presence of their own children (Zahn-Waxler et al., 1979). While this study indicates that mothers spontaneously model prosocial behaviors to their children, research that demonstrates a causal link between modeling and increased prosocial behaviors in children may inform interventions aimed at encouraging parents to add deliberate prosocial demonstrations whenever possible.

Modeling may be a particularly effective socialization practice for learning a helping behavior for several reasons. Since modeling involves demonstration rather than instruction or commands, it is unlikely to undermine children's intrinsic prosocial motivations. Modeling also places fewer linguistic demands on toddlers than direct instruction, and, unlike reinforcement, is a method of socialization that can be initiated even if a child has no behavioral response to witnessing another in distress. Finally, research suggests that children may not act prosocially if

they are unsure of what they can do to help (Staub, 1970). Bandura's self-efficacy theory (1977) states that individuals' self-perceived ability in a situation or domain determines whether they act on knowledge that they possess. Modeling prosocial behaviors for children and giving them opportunities to replicate the behaviors may equip them with specific strategies they can use to help others, enhancing their self-efficacy and thus increasing their prosocial responding when they encounter victims of distress. Our previous study supports the causal role of modeling in children's acquisition of a specific prosocial behavior, and identifies specific social learning mechanisms, imitation and goal emulation, through which modeling has its effect.

1.3 Goal Emulation and Imitation in Toddlerhood

Imitation and goal emulation are powerful social learning mechanisms through which children acquire new behaviors (e.g., Want & Harris, 2002). *Goal emulation* refers to learning about a *goal* that can be met and attempting to meet this goal using unique actions, or *means*. For example, if a toddler witnesses her parent place a blanket over a shivering boy, goal emulation would characterize learning if the observing toddler infers that warming the boy is the goal and achieves this goal through her own means—handing him a sweater. *Imitation* is similar to *mimicry* in that both involve reproducing the specific means that a model demonstrated, but *imitation* also involves understanding the goal of these actions. Mimicry would characterize learning if the observing toddler copies the witnessed means without recognizing the goal of the modeled actions (e.g., copying the action of placing a blanket over a child, but acting on a child who is not shivering) while imitation would characterize learning if she recognizes and copies both the model's goal as well as the specific means used to achieve that goal (e.g., she covers the boy with a blanket, having inferred that warming is the goal).

Most research on children's social learning has not systematically distinguished imitation

from goal emulation; instead, many studies attribute any similarity of actions between a model and observer to imitation without careful analysis (Want & Harris, 2002). To identify which mechanism underlies an instance of social learning, ideal studies have demonstrated means and goals that can be distinguished and have presented children with novel tasks so that learning, and not prior knowledge of the tasks, can be examined. In two related studies, 12-month-olds imitated by reproducing the goal a model demonstrated, turning on a light, using the specific means through which the model achieved this goal (often referred to in the literature as *target acts*), touching the light with the head (Carpenter, Nagell, & Tomasello, 1998; Meltzoff, 1988). The children looked at the light after they touched it, suggesting that they had learned the model's goal and were thus engaging in imitation, not mimicry (Carpenter et al., 1998). Goal emulation is also present in infants (Gergely, Bekkering, & Király, 2002; Huang, Heyes, & Charman, 2002; D. E. Thompson & Russell, 2004); in one study, 12-month-olds used their hands to achieve a goal instead of a tool that was difficult to use, even after seeing an adult employ the tool (Nielsen, 2006). While children are thought to become more imitative than emulative from age 2 to 5 years (Whiten, McGuigan, Marshall-Pescini, & Hopper, 2009), goal emulation is still a prominent mechanism in toddlerhood. One study found that both 23- and 30-month-olds more commonly emulated than imitated a series of tool actions by largely performing only actions relevant to their goal (McGuigan & Whiten, 2009). While studies have focused on children's social learning of actions on objects, imitation and goal emulation may also be effective means for promoting the acquisition of prosocial skills in toddlerhood.

Imitation is theoretically thought to serve not only an instrumental function of learning, for example a new skill or how an object works, but also a social function of identification and affiliation (i.e., the observer imitates a model to communicate that he and the model are alike and

to attempt to be liked by the model, Over & Carpenter, 2012; Uzgiris, 1981). While researchers have traditionally explained children's imitation in terms of the instrumental function, socially based motivations for imitation are increasingly being identified. For instance, 24-month-old children were more likely to imitate models who were socially responsive compared to models who were unable to provide the child with socially contingent engagement (Nielsen, Simcock, & Jenkins, 2008) as well as models with whom they were socially engaged versus those who are aloof (Brugger, Lariviere, Mumme, & Bushnell, 2007; Nielsen, 2006). Moreover, it has been proposed that children's tendency to *overimitate*, or reproduce a model's exact means even when they do not constitute the most efficient or logical strategy to attain a goal (e.g., Lyons, Young, & Keil, 2007) reflects social motivations to identify and affiliate with the model (Over & Carpenter, 2012). While imitation clearly serves a social function, none of the reviewed studies tested whether children can learn specific social behaviors, such as comforting behaviors, through social learning mechanisms. Findings from the current study, which evaluates the role of imitation in acquiring such behaviors, may contribute to research on the social functions of imitation.

1.4 Goal Emulation of Prosocial Behaviors in Toddlerhood

Experimental investigations of children's social learning of prosocial behaviors have largely examined modeling as a means of encouraging the use of previously learned prosocial behaviors. Because the models in these studies demonstrated familiar rather than novel prosocial behaviors, it is unclear whether learning occurred or whether the example led to prosocial responding through processes such as priming or emotion contagion. Further, these studies often did not use distinct means and goals, making it difficult to isolate the mechanism through which modeling had its effect. Identifying mechanisms underlying prosocial learning could inform the

types of demonstrations most likely to increase prosocial responding in children. For example, identification of imitation as a mechanism would suggest that very specific behaviors should be modeled for use in specific contexts, while pinpointing goal emulation as a mechanism would suggest that children can more readily generalize from modeled demonstrations.

In one study, kindergartners who listened as an experimenter ostensibly helped a child in distress were significantly more likely to subsequently help when they heard a distressed child than children for whom helping behavior was not modeled (Staub, 1971). In this study, children heard an audiotape of a child crying in the next room and were given a “helping” score if they went to the room or told the experimenter about the distress; since the design did not involve acting on an actual child, it is unknown whether child participants would have imitated the model’s exact means (e.g., by replicating the model’s comforting phrases). Similarly, a series of studies demonstrated that children donated more winnings from a bowling game to charity if they had first witnessed a model donate winnings (Bryan & Walbek, 1970a, 1970b; Grusec & Skubiski, 1970; Grusec, 1972; J. P. Rushton, 1975). This effect of modeling on donating persisted after an 8-week delay and when children played the game in a different room using a different charity box. These effects of durability and generalizability suggest that the results do not reflect simple conformity to a model but rather that children internalized the model’s behavior. However, it is unclear whether modeling had its effect through imitation or goal emulation, since donating represented both the means and the goal.

Children learn from both live models and video demonstrations (Rushton & Owen, 1975). A meta-analytic review revealed that children ages 3 to 17 who viewed prosocial content in television displayed greater prosocial behaviors than children who viewed neutral, antisocial or no television content (Mares & Woodard, 2005). Moreover, supplementing content with

prosocial classroom activities had no effect on prosocial outcomes, suggesting that modeling alone was sufficient to elicit an effect.

In summary, extant research addresses whether a model's example leads to increases in children's prosocial responding of any type (e.g., general nurturing responses). Thus, these studies demonstrate prosocial learning through a process akin to goal emulation. Importantly, none of these studies examined toddlers, and only our previous study has examined imitation as a means of acquiring *new* prosocial behaviors.

1.5 Children's Imitation of Social Behaviors

While research demonstrates that a model's example can also influence children's social behaviors through imitation, most studies have investigated imitation of antisocial rather than prosocial behaviors (e.g., Bandura, Ross, & Ross, 1961, 1963a, 1963b). For example, in the seminal Bobo doll experiment, children who witnessed an aggressive model displayed more non-demonstrated physically and verbally aggressive behaviors than children who witnessed a nonaggressive model, suggesting that the children emulated the goal of the model's example; further, children who witnessed an aggressive model displayed significantly greater imitation of demonstrated physically and verbally aggressive acts (e.g., tossing the doll while saying "Throw him in the air") and nonaggressive verbal responses (e.g., "He sure is a tough fella") than children who did not see a model or saw a nonaggressive model (Bandura et al., 1961).

Similarly, children may learn specific prosocial behaviors through the mechanism of imitation. One study found that 1.5- to 2.5-year-old children of mothers who routinely explained the causes of a victim's distress or addressed the victims were more likely to display altruism toward others (Zahn-Waxler et al., 1979). While imitation was not tested, the authors note that some of the substance of parents' altruistic actions appeared in their children's actions (e.g., a

child stroked an injured playmate's hair after witnessing her parent stroke a crying baby's hair).

This process appears to describe imitation, since children replicated both the goal that their parent demonstrated (relieving another's distress) as well as the specific means the parent used to attain that goal (stroking a victim's hair).

1.6 Our Previous Study

Only our previous experimental study has directly investigated imitation and goal emulation as mechanisms through which toddlers learn prosocial behaviors. In this study, 30-month-olds saw a video of an adult comfort a victim who had bumped her knee by using a novel prosocial behavior: patting her head with a mitt (Williamson et al., 2013). Following the video, the child's mother pretended to bump her knee, and children's helping behaviors were coded from video. Children who watched the video and witnessed their mother in distress were more likely to display both the novel prosocial behavior (imitation) and other, non-demonstrated prosocial behaviors such as hugging (goal emulation) relative to children who did not view the video but saw their mother in distress and children who watched the video but saw their mother engage in a neutral activity. This study used a novel prosocial demonstration, suggesting that children's use of the new behavior was due to learning rather than previous experience. Moreover, because the means and goal were distinct, imitation could be distinguished from goal emulation as the social learning mechanism. Finally, children displayed imitation, not mimicry, since they replicated the novel behavior only on a distressed parent and not when parents engaged in a neutral activity, suggesting that children inferred that the goal of the behavior was to relieve distress.

1.7 Social Learning of Reparative Prosocial Behaviors

While our previous study suggests that two-year-olds can learn a prosocial behavior to help another in distress through imitation and goal emulation, the current study is the first to examine whether children's social learning of prosocial behaviors extends to a context in which children have transgressed to cause another's distress. It is crucial that children learn to engage in reparative prosocial behaviors, as these behaviors repair damage to relationships and prevent chronic guilt—a maladaptive, ongoing condition of feeling guilty beyond the context of a transgression (Quiles & Bybee, 1997). However, evidence suggests that it may be more difficult for children to act prosocially toward a victim they have harmed compared to one they have not harmed—perhaps partially due to the guilt and shame that transgressions evoke. The current study investigated imitation and goal emulation as mechanisms through which children can learn to act prosocially in a transgressor context.

While children typically experience empathy as bystanders and transgressors, they may also experience self-conscious emotions such as guilt and shame as transgressors. Guilt is an emotion that focuses on negative aspects of a particular wrongdoing whereas shame focuses on negative aspects of the *self* for a wrongdoing (for review, see: Tangney, 1998). Dispositional guilt is a tendency to experience guilt in response to a specific event, whereas chronic guilt is an ongoing, maladaptive variant of guilt (Bybee & Quiles, 1998). Children as young as two display guilt and shame following transgressions (Aksan & Kochanska, 2005; Barrett, Zahn-Waxler, & Cole, 1993; Barrett, 2005; Garner, 2003; Kochanska, Barry, Jimenez, Hollatz, & Woodard, 2009; Kochanska, Forman, Aksan, & Dunbar, 2005; Kochanska, Gross, Lin, & Nichols, 2002). To assess guilt and shame, these studies used mishap paradigms in which children are led to believe that they have broken an experimenter's valued possession, and children's reactions are then

coded from videotape. It is theorized that very young children's affective responses following transgression constitute a blend of guilt and shame, which have been operationalized as signals of discomfort such as avoidance, tension, arousal, distress, lessened positive affect and increased negative affect (Kochanska et al., 2002). Chronic guilt and shame are both associated with depression and other symptoms of psychopathology (Harder, Cutler, & Rockart, 1992; Jones & Kugler, 1993; Quiles & Bybee, 1997), and chronic guilt is thought to develop when individuals cannot engage in reparative behaviors or other actions to alleviate guilty feelings (Bybee & Quiles, 1998; Tangney, Wagner, Fletcher, & Gramzow, 1992; Tangney, Wagner, & Gramzow, 1992; Zahn-Waxler & Kochanska, 1990). Thus, it is crucial that toddlers, who experience self-conscious emotions after transgressing, learn to alleviate these emotions through engaging in reparative behaviors. Even in children as young as three, fewer reparative attempts and chronic guilt and shame are associated with greater severity of depressive symptoms (Luby et al., 2009), suggesting the importance of learning to engage in reparative behaviors.

While behaving prosocially after transgressing is critically important, studies suggest that children have more difficulty engaging in prosocial behaviors in a transgressor context than in a bystander context. Children's personal responsibility for another's distress affects their rate of prosocial responding, with most studies reporting that children are less prosocial as transgressors than as bystanders (Dunn & Brown, 1994; Dunn & Munn, 1986; Zahn-Waxler et al., 1979; Zahn-Waxler, Radke-Yarrow, et al., 1992), and only one study finding that children are more prosocial as transgressors (Demetriou & Hay, 2004). Studies have documented other important differences in prosocial responding depending on whether children were transgressors or bystanders, highlighting the distinctiveness of the contexts. In a study conducted by Zahn-Waxler and colleagues (1992), mothers were trained to observe their 1-to-2 year old toddlers'

responses to others' distress that children both caused and witnessed. As transgressors, toddlers were less likely than bystanders to display empathic concern and engage in hypothesis testing about the cause of the victim's distress and more likely to display self-distress, aggression and positive affect. Other studies have found a similar pattern of findings; one study found that children more often responded with aggression as transgressors than as bystanders (Demetriou & Hay, 2004), and another study found that children less frequently engaged in hypothesis testing as transgressors than bystanders (Zahn-Waxler & Radke-Yarrow, 1982), possibly indicating that they understood that they caused the transgression (Zahn-Waxler & Kochanska, 1990). Further, one experimental study found that a group of toddlers looked or turned away from the experimenter and were slow to attempt reparation after transgressing, demonstrating patterns of avoidant behavior in toddlers following a transgression (Barrett et al., 1993).

It is possible that the distinct emotions that children experience as transgressors (i.e., guilt and shame) partially account for why prosocial responding is difficult in a transgressor context. While predispositional guilt motivates reparative behaviors, shame is associated with behaviors such as withdrawal, avoidance, aggression, denial and fewer reparative behaviors (Tangney, 1998). Self-conscious emotions can be overwhelming, as they can elicit a high degree of affective discomfort and stress response in children (Lewis & Ramsay, 2002). The degree to which these emotions are motivating or overwhelming likely depends on which emotion is primary, the strength of the emotions, and personal characteristics of the child, such as ability to regulate such potentially strong emotions (Lewis & Ramsay, 2002).

Learning to act prosocially toward a person one has harmed is an important skill to master, as reparative behaviors reduce damage to relationships that the transgression has caused (Baron, 1990; Ohbuchi, Kameda, & Agarie, 1989) and alleviate guilt, preventing guilt from

becoming chronic (Bybee, Zigler, & Berliner, 1996; Quiles & Bybee, 1997). Thus, learning to engage in reparative behaviors in toddlerhood while prosocial abilities are developing has implications for healthy relational and psychological functioning. Evidence that children engage in less prosocial and more avoidant and aggressive behaviors as transgressors than bystanders suggests that prosocial responding is potentially more difficult for children in a transgressor context than a bystander context; thus, it is important to investigate imitation and goal emulation as mechanisms to increase reparative prosocial responding in this difficult context.

1.8 Overview of the Current Study and Hypotheses

In summary, while young children's prosocial development is associated with socialization experiences (Hastings, 2007), few studies have tested causal mechanisms that underlie prosocial learning, particularly in a transgressor context. Our previous work suggests that imitation and goal emulation are mechanisms through which children can learn prosocial behaviors from a model's example and use them in a bystander context (Williamson et al., 2013). The purpose of the current study is to investigate children's imitation and goal emulation of a prosocial behavior when they have transgressed to cause their parent's distress. The design follows that of Williamson et. al, (2013), but was modified by using a transgression paradigm to lead children to believe they have caused their parent's distress, and by adding a trial in which parents feign sadness to increase generalizability to other distressing situations. Results will inform whether others' examples can promote children's reparative prosocial responding in transgressor contexts.

The *hypothesis* of the current study is that children who watch a video of a model demonstrating a novel prosocial behavior will be more likely to perform the novel behavior to alleviate their parent's distress (imitation) and to display other, non-demonstrated prosocial

behaviors (goal emulation) relative to (a) children who do not watch the video but see their parent in distress and (b) children who watch the video but see their parent engage in a neutral activity. Since studies have demonstrated that children engage in spontaneous prosocial behaviors in both bystander and transgressor contexts and can imitate and emulate the goal of a modeled prosocial behavior in a bystander context, it is expected that children will also be able to imitate and emulate the goal of a modeled prosocial behavior when they have transgressed to cause their parent's distress. It is important to test this hypothesis in a transgressor context, given the potential interference of guilt and shame in children's reparative prosocial responding.

2 METHOD

2.1 Participants

Participants were a community sample ($N=55$) of typically developing toddler-aged children and their parent. One child with mild Autism Spectrum Disorder (ASD) was excluded from analyses, resulting in a final sample of 54. Children were either two (range = 29.3-33.7 months; $M_{age}=31.52$ months; $SD=1.05$ months) or three years old (range = 35.1-47.6 months; $M_{age}=37.85$ months; $SD=3.22$ months). The sample size was selected based on a power analysis. Parent-child dyads participated in the current study as part of a larger investigation of young children's imitation. The sample included 29 girls (53.7%) and 44 mothers (81.5%). The ethnicity of children was as follows: 76% Caucasian, 15% African-American, and 9% Biracial (Caucasian and Asian). The majority of participating parents had at least a college degree (89%).

Participants were recruited through word of mouth, postings throughout the community and on websites frequented by parents of young children, families who had previously participated in university studies and agreed to be contacted about additional studies, and the Georgia State Infant and Child Subject pool. The subject pool is a database primarily composed

of parents of child patients of pediatricians' offices across the Atlanta area. Children were included in the subject pool if parents expressed interest in research and consented to be added to the database. Research assistants and parents discussed the study over the phone. Interested parents were provided with a short description of the study, including required time commitment (1 hour). Parents were notified that participation was voluntary, that children and parents would be videotaped, and that children would be compensated with a toy worth approximately \$10. Consent was then obtained from parents to gather demographic information (race/ethnicity, age, and gender of children and parents, and parent's education level) and an appointment was scheduled for the parent and child to participate in the study at the Learning & Development Lab at Georgia State University.

2.2 Measures

2.2.1 My-Child-2 Affective Discomfort Scale (My-Child AD).

The My-Child-2 questionnaire (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994) is a parent-report measure of children's emotional and behavioral responses to their own misbehaviors. Parents rate items on a 7-point Likert scale from 1 (extremely untrue, not at all characteristic) to 7 (extremely true, very characteristic) of their child. The current study examined the 18-item Affective Discomfort after Wrongdoing scale to provide a measure of children's guilt, remorse and other emotional reactions after transgression, mishap or wrongdoing. Many of the scale items were modeled after Rothbart's guilt/shame scale of the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, & Hershey, 1994). Sample items include: "Likely to look remorseful or guilty when caught in the middle of a forbidden activity" and "Avoids eye contact if she or he has done something naughty." Items were summed to create a total score. Scores were prorated across the scale so long as less than 25% of items were

missing. Questionnaires for two children contained too much missing data to use in analyses. The authors report that the scale has good internal consistency and test-retest reliability. The internal consistency reliability in the current sample was high ($\alpha=.83$). Finally, the scale was positively correlated with children's observed behavioral expressions of discomfort after wrongdoing in 56-month old children (Kochanska et al., 2002), demonstrating construct validity. The scale also demonstrated convergent and discriminant validity in that it was correlated with, but distinct from children's temperamental reactivity (as assessed by the CBQ, Kochanska et al., 1994), which is a theorized underpinning of children's affective discomfort after wrongdoing (Kochanska, 1991).

2.3 Experimental Design

The design was based on that used by Williamson, Donohue, and Tully (2013). Children experienced either neutral interactions or pretend transgressions against their parent, depending on experimental condition.

The design of the transgressions was adapted from previous research (Barrett et al., 1993; Cole, Barrett, & Zahn-Waxler, 1992; Kochanska, Casey, & Fukumoto, 1995; Kochanska et al., 2002). Children experienced two trials that differed depending on whether the pretend transgression caused the parent's pain or sadness. While our previous study utilized a pain scenario, a sadness scenario was added to the current study to increase the generalizability of the findings to other forms of distress. One other study has examined children's prosocial responses to another's pain and sadness and found both similarities and differences in children's responses between the two emotional contexts (e.g., children were more prosocial in response to sadness; (Bandstra, Chambers, McGrath, & Moore, 2011), suggesting the importance of examining more than one emotional context. The order of the trials was counterbalanced. The trials occurred 30

minutes apart to decrease the likelihood that the occurrence of two transgressions would appear artificial to children. Other studies using a transgression paradigm have included at least two mishaps successfully with toddlers (e.g., Cole et al., 1992; Kochanska et al., 1995, 2002). Providing more than one opportunity to display learned prosocial behaviors improves validity of the measurement, which is particularly important to counter challenges (e.g., distraction) in studies of young children.

2.4 Materials

2.4.1 Novel prosocial objects.

The following two objects were each used to demonstrate a novel prosocial act during two video vignettes (Figure 1). These unusual objects were chosen as items that children (a) would be unlikely to recognize and (b) would not have previously used in a prosocial context:

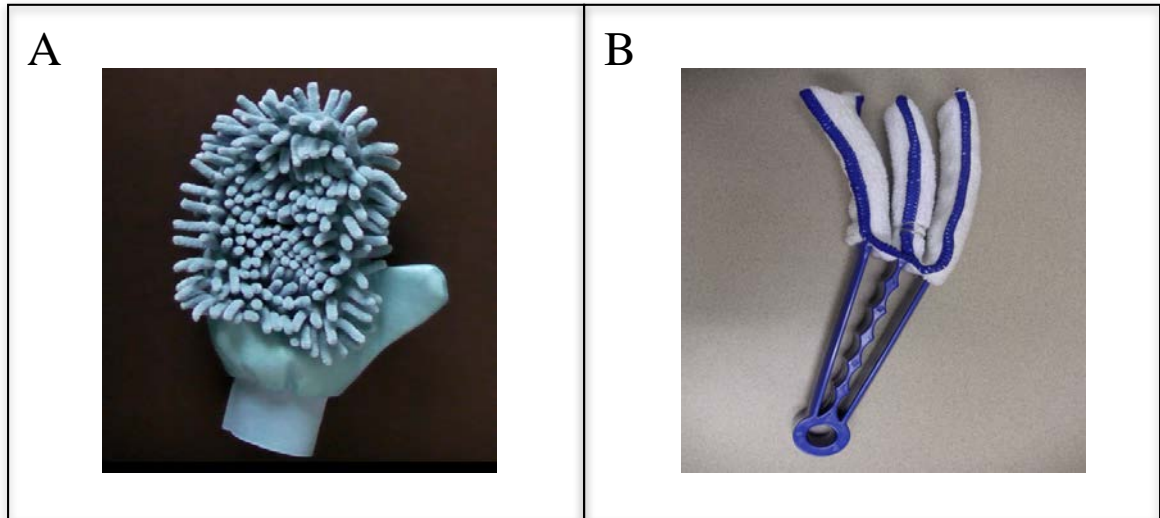


Figure 1. Still photos of the novel prosocial objects: A) cleaning mitt and B) blind duster.

2.4.1.1 Cleaning mitt (A).

A blue cleaning mitt (24 x 18.5 cm) with multiple 1-inch cloth tentacles covering one side.

2.4.1.2 Blind duster (B).

A blue blind duster (23 x 8 cm) with a handle on one end and three prongs covered in white microfiber on the other end.

2.4.2 Transgression items.

The following objects were used to lead children to believe that they had transgressed to cause pain or sadness in their parent:

2.4.2.1 Pounding toy.

A pounding toy composed of a bench of blocks and a hammer.

2.4.2.2 *Rigged picture frame.*

A framed photo of a colorful parrot was rigged so that the frame fell apart when handled.

2.4.3 *Demonstration Videos.*

One 45-second video-recorded vignette (presented on a 9-inch screen) was used to demonstrate each novel prosocial behavior. The two video demonstrations, rather than live presentations, ensured competent acting and uniformity of presentation. Research has demonstrated that infants and toddlers can imitate a model's demonstration presented through video (Barr & Hayne, 1999; Hayne, Herbert, & Simcock, 2003). In both videos, a female actor simulates distress and a male actor uses the novel prosocial behavior to help her. The demonstrated novel prosocial acts each involve the novel prosocial object and several steps, which made the measure more sensitive to subtle individual differences in children's imitation and allowed for establishing clear guidelines for scoring children's imitation of the acts.

2.4.3.1 *Pain video.*

One video demonstrated a novel prosocial behavior to alleviate physical pain (see Williamson et al., 2013). The video begins as Actor 1 bends in pain, demonstrates a distressed facial expression and vocal tone and says, "Ow! My finger. It really hurts. Ow." Actor 1 rubs her finger, says "ow" and demonstrates a pained facial expression. Actor 2 then models the *target acts* (prosocial acts): he says, "I'll help you," puts the cleaning mitt on his hand, and grasps the wrist cuff of the mitt with his other hand. Finally, he leans over and pats Actor 1's head with the mitt four times, first with palm down and then with palm up in an alternating fashion. Actor 2 says "eee, eee" each time he flips his palm. Actor 1 then recovers by smiling and saying, "I feel better now."

2.4.3.2 Sadness video.

The other video demonstrated relieving sadness. The video begins as Actor 1 points at a photo book that has ripped pages, demonstrates a distressed facial expression and vocal tone and says, “Oh, no. My book. I’m really sad. Oh, no.” Actor 1 continues to say “oh, no” and demonstrate a sad facial expression. Actor 2 then models the target acts (prosocial acts): he says, “I’ll help you,” and picks up the blind duster by the white microfiber end with both hands. Finally, he runs the blind duster down the arm of Actor 1 four times, first on one arm, then down the other in an alternating fashion. Actor 2 says “ahh, ahh” each time he runs the duster down an arm. Actor 1 then recovers by smiling and saying, “I feel better now.”

2.4.4 Scripts.

Parents used the following scripts in order to feign pain and sadness or interest in objects, depending on whether or not their experimental condition included transgressions. Scripts were matched for approximate duration, body positions, and vocalizations.

2.4.4.1 Transgressor scripts.

2.4.4.1.1 Pain trial

The parent slipped a finger on top of a block as the child hammered, pretending that the child had hammered her finger. The parent bent to rub her finger and feigned distress using facial expressions and tone of voice while following a short script: “Ow! You hit my finger. It really hurts. Ow.” The parent used a stopwatch and repeated this line after 30s. Then, the experimenter re-entered the room, cueing the parent to recover, saying, “I feel better now.”

2.4.4.1.2 Sadness trial.

The parent asked the child to hold the rigged frame. As the parent handed the frame to the child, it fell apart. The parent feigned distress using facial expressions and tone of voice while following a short script: “Oh, no. You broke my frame. I’m really sad. Oh, no.” The parent used a stopwatch and repeated this line after 30s. Then, the experimenter re-entered the room, cueing the parent to recover, saying, “I feel better now.”

2.4.4.2 Neutral scripts.

2.4.4.2.1 Pain trial.

The child hammered with the pounding toy and the parent pointed to a hammered block. The parent bent to inspect the block and used a neutral tone while following a short script: “Oh. Look at this block. Oh look.” The parent used a stopwatch and repeated this line after 30s. The parent repeated “oh, look” and continued using a neutral tone and facial expressions. Then, the experimenter re-entered the room, cueing the parent to resume normal interactions with the child.

2.4.4.2.2 Sadness trial

The parent asked the child to hold the frame. As the parent handed the frame to the child, it remained intact. Instead, the parent pointed to the frame and used a neutral tone while following a short script: “Oh. Look at my frame. Oh, look.” The parent used a stopwatch and repeated this line after 30s. Parents repeated “oh, look” and continued using neutral tone and facial expressions. Then, the experimenter re-entered the room, cueing the parent to resume normal interactions with the child.

2.5 Procedures

Informed consent, including consent for the session to be videotaped, was obtained from parents. Parents were told that they would be able to withdraw themselves and their children from the study at any point for any reason, including child distress, without loss of benefits. Parents then completed the *My-Child* AD measure. Parents were then led to the testing room with a researcher while another researcher remained with the child in the consent room and engaged in a warm-up play period. Parents received training on acting out the appropriate scripts (transgressor or neutral) from the experimenter. At this time, parents were warned that crying was a possible, albeit uncommon, child response to the transgressor scripts and were again reminded that participation in the paradigm was voluntary. The experimenter ensured the parent's understanding of the procedures, and parents were able to refer to written scripts during the trials. The remainder of the session was videotaped.

Parents joined their children in the experimental room and sat in a chair next to their child. The first trial (either pain or sadness) occurred as the first paradigm of the lab visit. Each trial consisted of several phases (see Trial phases, below). Children in a video condition watched a prosocial demonstration video. All children were then given the novel prosocial object to examine. Then, parents simulated either a transgression or a neutral interaction with their child using either the transgressor or neutral script. Parents answered a follow-up question, and children were asked follow-up questions aimed at assessing children's understanding of fault for the transgression or neutral interaction. The larger study procedures then occurred over the next 45 minutes (e.g., tasks involving children's source memory, imitation of tool use, and production of gestures). Finally, the second trial occurred as the last paradigm of the lab visit. This trial

followed an identical sequence as described above. Finally, children in a condition involving the transgressor scripts were debriefed, and families left the lab.

2.5.1 Experimental Conditions.

Prior to the lab visit, children were assigned to one of three experimental conditions: experimental, no-video control, or no-distress control. Restricted random assignment ensured an equal number of girls and boys in each condition. Table 1 displays a breakdown of the components of each experimental condition.

Table 1. Components of experimental conditions

		Transgressor scripts	Neutral scripts
Video	Demonstration Video	Experimental	No-Distress Control
	No Video	No-Video Control	N/A

2.5.1.1 Prosocial Demonstration/Transgressor Scripts (Experimental) Condition.

In this condition, children watched the videos demonstrating the novel prosocial behaviors. Parents followed the transgressor scripts. This condition assessed children's imitation of the novel prosocial behaviors.

2.5.1.2 No Demonstration/Transgressor Scripts (No-Video Control) Condition.

Children in this condition did not watch a video for either trial. Parents followed the transgressor scripts. This condition assessed children's spontaneous prosocial responses and use of the cleaning mitt or blind duster when confronted with a distressed parent.

2.5.1.3 Prosocial Demonstration/Neutral Scripts (No-Distress Control) Condition.

Children watched the demonstration videos. Parents followed the neutral scripts. This condition assessed whether target acts in the experimental condition were produced only for

prosocial ends and thus determined whether children's production of target acts reflected imitation or mimicry.

2.5.2 Trial phases.

Children in all conditions progressed through the following phases of each trial, with the exception that for children in the no-video control condition, the demonstration phase did not occur (Figure 2).

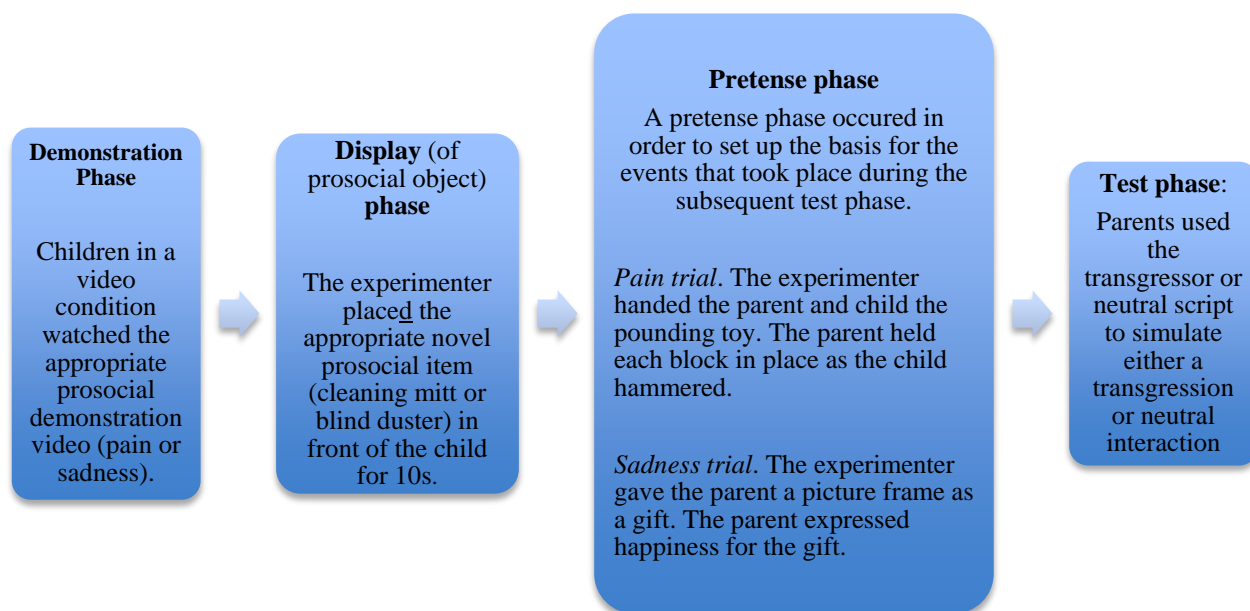


Figure 2. Flow chart of trial phases.

2.5.2.1 Demonstration phase.

Children in a video condition watched the appropriate prosocial demonstration video (pain or sadness).

2.5.2.2 Display (of prosocial object) phase.

The experimenter placed the appropriate novel prosocial object (cleaning mitt or blind duster) in front of the child for 10s, giving the child the opportunity to examine the object and potentially use it to replicate the demonstrated actions.

2.5.2.3 Pretense phase.

A pretense phase occurred in order to set up the basis for the event that took place during the subsequent test phase (transgression or neutral interaction).

2.5.2.3.1 Pain trial

The experimenter handed the parent and child the pounding toy and said, “you can play with this toy for a while.” The parent held each block in place as the child hammered.

2.5.2.3.2 Sadness trial.

The experimenter handed the parent a picture frame and said to the parent, “I have this present for you for coming in today!” after which the parent held the frame and expressed excitement using a short script: “Oh, I love this frame. It’s my new favorite present. It makes me happy!” This procedure was used to demonstrate to the child that the frame was of value to the parent. The experimenter then took the frame from the parent, telling her that she would put a special sticker on the frame. The experimenter switched out the frame for an identical frame that now included a sticker. The frame was either rigged (for children in a condition involving the transgressor script) or intact (for children in a condition involving the neutral script). The experimenter then gave the appropriate frame to the parent.

2.5.2.4 Test phase.

The experimenter left the room, which cued the parent to act out the appropriate script (transgressor or neutral). Parents' initiation of the script denoted the beginning of the 60s test phase. The researcher waited outside the door; she began timing when she heard the parent begin the script, and re-entered the room after 60s.

2.5.3 *Transgression check follow-up questions.*

The experimenter asked follow-up questions to the child and parent immediately following each trial to assess whether children believed that they were responsible for any transgression that occurred during the test phase.

2.5.3.1 Parent ratings of children's perceived fault.

Parents completed one written question that asked whether they thought their child believed the events that occurred during the test phase were his or her fault. Questions were written without reference to a transgression so that parents of children in the no-distress control condition would be equally able to indicate that they thought their children believed they were at fault. For the pain trial, the question asked: "Do you think your child thought what happened with the pounding toy was his/her fault?" For the sadness trial, the question asked, "Do you think your child thought what happened with the frame was his/her fault?" Parents responded using a four-point scale (0= *definitely not*, 1= *probably not*, 2= *probably yes*, 3= *definitely yes*). We expected that parents of children in a condition that used the transgressor scripts would be significantly more likely to rate that their child believed that he/she had transgressed than parents of children in the no-distress control condition, supporting the validity of the transgression paradigm.

2.5.3.2 Children's report of their perceived fault.

The experimenter then asked children in all experimental conditions three questions that were adopted from other studies that use transgression paradigms (e.g., Kochanska et al., 1995). We expected that children in a condition that used the transgressor scripts would be significantly more likely to indicate that they were at fault than children in the no-distress control condition, further supporting the paradigm's validity.

2.5.3.2.1 "What happened" (Narrative question).

First, the experimenter queried the child, saying "What happened to mom/dad and the toy?" and pointed to the pounding toy (pain trial) or "What happened to mom/dad and the frame" and pointed to the rigged frame (sadness trial). The experimenter waited for the child's narrative response and prompted twice by repeating the question if the child did not respond. Children's narrative responses to this question were transcribed and given a binary score for the presence (1) or absence (0) of children's references to the fact that they themselves caused the transgression. Off-topic narratives were coded as a non-response (missing data).

2.5.3.2.2 Who did it?

Next, the experimenter queried, "Who did it?" and again used prompting if the child did not respond. Children who did not respond to this question after prompting were asked, "Was it me, was it you, or was it mom/dad?" Children's responses to this question were transcribed and given a binary score corresponding to children indicating that they did it (1) or that someone else did it (0). Thus, responses that indicated that parent or the experimenter caused the transgression were grouped together.

2.5.3.2.3 Did you do it?

Then the experimenter queried, “Did you do it? Yes, or no?” and again used prompting if the child did not respond. Children’s responses to this question were given a binary score corresponding to yes (1) or no (0).

2.5.4 Debriefing.

Children assigned to a condition involving the transgressor scripts were debriefed at the end of the study to minimize distress. The experimenter explained to the child that hurting the parent was not the child’s fault, and that the child did not break the frame, which frequently breaks. The experimenter then told the child that she would fix the frame, and returned with an intact frame to show to the child. Debriefing has been used successfully to reduce children’s distress in other studies that use a transgression paradigm (e.g., Kochanska et al., 1995).

2.5.5 Scoring and Rating of Observational Data.

Research assistants (RAs) who were blind to the study hypothesis scored or rated two measures of the children’s prosocial responding from videos. RAs began watching videos at the start of the test phase. Thus, RAs did not see whether or not the child watched the video. Scoring and rating procedures were identical in both trials (pain and sadness).

2.5.5.1 Target acts (imitation).

In all conditions, children’s production of the demonstrated prosocial act during the test phase was scored for each trial as a measure of imitation. Children received 1 point each for replicating 6 possible demonstrated actions with the prosocial item (see Appendix A). Scoring was designed to give children some credit for partial fulfillment of the target acts. A target acts

(imitation) score was calculated by summing points within trials and then averaging across the two trials.

2.5.5.2 Conventional acts (goal emulation).

Children's attempts to relieve distress using other, non-demonstrated prosocial behaviors (e.g., hugging the parent, using statements of concern, apologizing) during the test phase were also rated for all conditions as a measure of goal emulation. The presence and intensity of these behaviors were rated on a 5-point scale (0= *none*, 4= *strong*) based on the systems used by Williamson, Donohue and Tully (2013) and Zahn-Waxler, Cole, Welsh and Fox (1995; See Appendix B). A conventional acts (goal emulation) rating was made for each trial, and trials were then averaged together.

2.5.5.3 Distress

The presence and intensity of distress (facial, vocal, or gestural/postural expressions of generalized distress including concern/anxiety/sadness/anger) were rated on a 5-point scale (0= *none*, 4= *strong*) based on the system used by Zahn-Waxler, Cole, Welsh and Fox (1995; See Appendix B). A distress rating was made for each trial, and trials were then averaged together. Children's distress was coded in order to compare children's distress in response to the transgressions in this study to their typical distress following transgressions (using the *My-Child AD*) as a third transgression check.

2.5.6 Training and reliability of scorers/raters

One team of two trained scorers scored children's target acts (imitation) and a different trained rater rated the conventional acts (goal emulation). Raters trained by reading the manual and meeting with the primary investigator (PI), who served as the master rater, to discuss ratings

and examples and ask questions. The raters first watched a training video with the PI, who reviewed the rating (of target acts or conventional acts). Raters then watched and rated the initial training video on their own and met with the PI to review all ratings and reconcile any discrepancies. Next, raters were given one new training video at a time to rate independently. They met with the PI to discuss the ratings. After five videos were rated independently, initial inter-rater reliability was assessed with a two-way, mixed, absolute agreement intraclass correlation coefficient (ICC). This statistic is identical to using a weighted kappa with quadratic weights for ordinal scales, and the two can be used interchangeably (Norman & Streiner, 2008). Rating of videos continued until reliability of at least .75, considered in the excellent range (Cicchetti, 1994), was attained.

Raters were then assigned 4 videos to rate at a time. After completing a set of videos, the raters met with the PI/master rater to review the ratings for one randomly selected video to minimize observer drift (i.e., the implicit change in code definitions made by observers over time; Kazdin, 1977; Smith, 1986). Again using an ICC, reliability for observer drift was calculated for the randomly selected 25% of each rater's videos. Drift reliability was monitored to ensure that reliability of at least .75 was maintained. The PI served as the reliability rater for both initial reliability and drift reliability. ICCs for each scored or rated variable are presented in Table 2.

Table 2. Reliabilities (Intraclass Correlation Coefficients) for Scored or Rated Variables

Scored/Rated Variable	Rater 1		Rater 2		Rater 3	
	Training	Drift	Training	Drift	Training	Drift
Target Acts (Imitation)	.94	.97	.96	.99	-	-
Conventional Acts (Goal Emulation)					.88	.93
Distress					.92	.85

2.5.7 Piloting participants.

The study was piloted on a small group of children to test several particularly novel aspects of the design. The pilot used prosocial demonstration videos with 12 possible demonstrated actions with the prosocial item. The pilot tested a) children's interest in the prosocial demonstration videos and b) examined whether the videos were too complex, or if children were able to imitate 12 possible actions. Piloting revealed that children's interest in the prosocial demonstration videos was strong, but the videos appeared too complex; children who imitated the demonstrated video used far fewer than 12 actions; thus, new prosocial demonstration videos with only 6 possible actions were created and used for data collection as to not present demonstrations to children that were too complex to replicate.

The pilot also tested aspects of the test phase. The pilot utilized a rigged bear during the sadness trial. However, the bear appeared to be causing too much distress in children (i.e., several children cried). Thus, a rigged frame was utilized instead and was piloted on additional children. Using the rigged frame resulted in far less distress in children (i.e., none of these pilot children cried); thus, the rigged frame was used in data collection. Piloting was also conducted to assess whether the transgressions appeared believable to children (e.g., whether children would laugh rather than display concern); no child laughed, and pilot children engaged in a variety of prosocial behaviors to help their parent, suggesting that the paradigm was believable to children. Piloting was also used to examine whether 60s was too lengthy for the test period, as our previous study used a 30s test period. As pilot children acted prosocially throughout the 60s test period, it was determined that this was an appropriate length for the paradigm.

Finally, the pilot also examined the effectiveness of asking follow-up questions to parents and children to assess children's understanding of the transgressions. The pilot utilized pictures

to facilitate children's understanding of the child fault questions. For example, when the child was asked the question "who did it?" a picture with two adults and one child was used and the child was told that the pictures represented the experimenter, parent and child respectively. Children were able to point to a picture to indicate their answer. However, the pictures appeared to confuse children (e.g., children often gave verbal answers that conflicted with the picture that they pointed to); thus, they were not used in data collection. As parents and children appeared to largely understand and respond to the fault follow-up questions, these questions were retained for data collection.

3 RESULTS

3.1 Descriptive Statistics

Means, standard deviations, and ranges for study variables are presented in Table 3.

Correlations among continuous variables are displayed in Table 4 and are discussed below.

Descriptive information about categorical variables is also presented in the text below.

As previously mentioned, this study employed two trials varying in emotional content in order to a) provide children with more than one opportunity to demonstrate target acts or conventional acts, b) increase generalizability of study findings to different emotional contexts and, c) decrease the chance that transgressions would be artificial to children (e.g., experiencing two feigned transgressions involving parent's pain may appear more artificial than experiencing two more disparate transgressions). We used one total score for each outcome (target acts, or imitation; conventional acts, or goal emulation) that was created by averaging scores across pain and sadness trials. Overall, children's behaviors as well as parents' and children's responses to follow-up questions on the pain trial were positively correlated with those of the sadness trial. This indicates that children's and parent's behaviors and responses were consistent across the

two trials, relative to other children and parents in the sample. Children's conventional acts between pain and sadness trials were significantly and positively correlated, $r = .75, p = .00$, as was children's distress between pain and sadness trials, $r = .55, p = .00$, supporting the creation of total scores. As children in the no-distress condition in which there was not a transgression to repair largely received a conventional acts rating of 0 and a distress rating of 0, their conventional acts and distress ratings may be driving associations involving these variables. To account for this possibility, correlations between pain and sadness trials for the conventional acts and distress variables were repeated on the subset of children in a condition that utilized the transgressor script (experimental and no-distress control conditions). The correlations remained positively and significantly correlated, $r = .52, p = .00$; $r = .43, p = .01$, respectively. Parent ratings of children's perceived fault were significantly and positively correlated between pain and sadness trials, $r = .40, p < .01$. Similarly, children's report of their perceived fault between pain and sadness trials was positively and significantly correlated, $r = .40, p < .01$. Children's target acts scores were not significantly correlated between pain and sadness trials, $r = -.05, p = .71$, likely reflecting the fact that only 6 children produced any target acts, and each of these children did so on only one trial.

Table 3. Descriptive Statistics of Primary Study Variables: Means, Standard Deviations, and Ranges

	Possible Range	Observed Range	Mean (<i>SD</i>) or Frequency			
			Overall Sample	Experimental	No-video control	No-distress control
1. Age (% two years old)	0-1	0-1	57.4%	50%	55.6%	66.7%
2. Gender (% female)	0-1	0-1	53.7%	55.6%	55.6%	50.0%
3. Parent gender (% mothers)	0-1	0-1	81.5%	88.9%	72.2%	83.3%
4. <i>My-Child</i> AD	18-126	37-102.71	77.70 (13.78)	74.31 (11.68)	75.76 (16.20)	83.72 (11.75)
5. Distress	0-4	0-3.5	1.42 (.87)	2.00 (.79)	1.61 (.63)	.64 (.56)
6. Parent fault question	0-3	0-3	1.83 (.95)	2.36 (.51)	2.21 (.90)	.88 (.63)
7. Child fault question	0-1	0-1	.63 (.38)	.90 (.21)	.80 (.27)	.33 (.33)

Table 4. Correlations among Continuous Study Variables

	2.	3.	4.	5.	6.
2. <i>My-Child</i> AD		-.14	-.31*	.04	-.25
3. Target Acts			.13	-.07	.10
4. Conventional Acts				.47**	.50**
5. Distress					.53**
6. Parent fault question					

3.1.1 Correlations among variables.

Conventional acts scores were positively associated with *My-Child* AD scores and parent ratings of children's perceived fault and negatively associated with children's distress. Children's distress was positively associated with parent ratings of children's perceived fault. All correlations among study variables displayed in Table 4 were repeated on only children in a

condition that utilized the transgressor script (experimental and no-distress control conditions). Among children in these two conditions, only a correlation between children's *My-Child* AD scores and their distress was significant, which will be discussed below (see Deception Manipulation Checks).

3.1.2 Group differences among variables.

Boys ($M = 35.86$, $SD = 4.59$) were older than girls ($M = 33.17$, $SD = 2.77$), $t(51) = -2.631$, $p = .01$. Tests of differences in outcome variables by demographic variables and trial order were conducted in order to determine whether covariates should be included in tests of the study hypothesis. Independent samples t-tests did not reveal significant differences in target acts or conventional acts scores by categorical demographic characteristics (i.e., child gender, parent gender, child race, child age) or trial order. A series of t-tests were conducted to examine whether mean levels of target acts or conventional acts scores differed by these categorical demographic variables within any of the three conditions. No significant differences were found.

Random assignment was expected to produce an equal distribution of pertinent demographic and dispositional variables across experimental conditions. Statistical tests were conducted to confirm this assumption. Restricted random assignment ensured a proportion of boys and girls that was not significantly different across experimental conditions. Chi-square tests using the Yates correction revealed that neither the number of paternal parent actors nor the number of children in each age group was significantly different across conditions. A one-way ANOVA revealed no significant effect of condition on *My-Child* AD scores such that children's tendency to experience distress following transgressions was not significantly different across conditions.

In sum, there were no differences in target acts or conventional acts scores by relevant demographic variables or trial order. Thus, covariates were not included in the tests of the hypothesis.

3.2 Deception Manipulation Checks.

The three manipulation checks were analyzed to examine whether the transgressor script successfully led children to believe that they had transgressed.

3.2.1 Parent's ratings of children's perceived fault.

First, we tested whether parent's report that their child believed they had transgressed during the test phase differed depending on condition. Assumptions of ANOVA were tested. There were no outliers in the data, as assessed by no cases with standardized residuals greater than ± 3 standard deviations. Ratings were not normally distributed for the no-distress control condition, $D(17) = .25, p = .01$, the no-video control condition, $D(17) = .22, p = .03$, or the experimental condition, $D(18) = .27, p = .00$, as assessed by the Kolmogorov-Smirnov test of normality. Following the recommendations of Levine and Dunlap (1982), square root, logarithmic, and inverse transformations were attempted, as transformations may correct skew. The distributions were still significantly different from normal following transformations. Thus, a non-transformed variable was used in subsequent analyses. The assumption of homogeneity of variances was violated, as assessed by Levene's Test of Homogeneity of Variance $F(2,49) = 4.57, p = .02$. As assumptions of ANOVA were violated, a nonparametric test, the Kruskal-Wallis H Test was used. Nonparametric strategies are recommended when ANOVA assumptions are violated, as these statistics can increase power, are less sensitive to the degree of sample normality and may also be used for outlier-prone distributions (Lantz, 2013; Zimmerman, 2001).

Parent ratings of children's perceived fault were significantly different among conditions, $\chi^2(2) = 24.11, p < .01$. Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. This post hoc analysis confirmed statistically significant differences in ratings between the no-distress control (mean rank = 11.34) and experimental (mean rank = 33.66; $p = .000$) conditions, and no-distress control and no-video control (mean rank = 32.76; $p = .000$) conditions, but not between the experimental and no-video control conditions. This result indicates that parents of children in a condition in which a transgression occurred provided significantly higher ratings that their children believed they were at fault than parents of children in the no-distress control condition in which a transgression did not occur.

3.2.2 Children's report of their perceived fault.

Second, we tested whether children's report of their perceived fault differed depending on condition. Children's own report of whether or not they had transgressed was more difficult to examine, as there was a large amount of missing data on these questions due to children's inability or unwillingness to answer the questions, or because the experimenter did not ask the questions if children were crying or tearing up following the transgressions. Table 5 displays the pattern of missingness, which was similar between pain and sadness trials. Table 6 displays frequencies of children who indicated fault among participants with valid data. The large amount of missing data made computing an average score of children's responses to the three child questions less than ideal. Thus, one representative question was selected to include in analyses. The fault question with the least amount of missing data, "Did you do it?" was selected.

Table 5. Percent Missingness on Children's Fault Questions

	Percent Missing			
	Overall Sample	Experimental	No-video control	No-distress control
<i>Pain Trial</i>				
1. What happened?	48.1%	44.4%	33.3%	66.7%
2. Who did it?	35.2%	38.9%	44.4%	22.2%
3. Did you do it?	16.7%	22.2%	11.1%	16.7%
<i>Sadness Trial</i>				
4. What happened?	40.7%	44.4%	38.9%	38.9%
5. Who did it?	35.2%	33.3%	44.4%	27.8%
6. Did you do it?	18.5%	22.2%	27.8%	5.6%

Table 6. Number and Percent of Children Indicating Fault on Children's Fault Questions

	Percent							
	Overall Sample		Experimental		No-video control		No-distress control	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Pain Trial</i>								
1. What happened?	14	50%	6	60.0%	7	58.3%	1	16.7%
2. Who did it?	23	65.7%	10	90.9%	7	70.0%	6	42.9%
3. Did you do it?	34	75.6%	11	78.6%	13	81.3%	10	66.7%
<i>Sadness Trial</i>								
4. What happened?	7	21.9%	3	30.0%	4	36.4%	0	0%
5. Who did it?	17	48.6%	9	75.0%	5	50.0%	3	23.1%
6. Did you do it?	26	59.1%	10	71.4%	9	69.2%	7	41.2%

Analyses were conducted to determine whether children with missing data on the selected fault question differed significantly from children with valid data on any relevant dispositional (*My-Child*) demographic (age, child gender, parent gender) or study variables (target acts, conventional acts, distress). Only one significant difference emerged; more boys than girls had missing data on this question, $\chi^2(2) = 6.46, p = .01$. The number of children with valid data ($n = 41$) was evenly distributed across experimental conditions.

Chi square analyses using a 3x3 contingency table and the Yates correction revealed no significant effect of condition on children's report of their perceived fault¹, $\chi^2(2) = 6.62, p = .35$. This result indicates that children in a condition in which they were made to believe they transgressed did not report significantly more fault than children in the no-distress control condition in which a transgression did not occur.

3.2.3 My-Child AD Scale and children's rated distress.

One final manipulation check involved comparing parent's report of children's typical displays of distress following transgressions to children's rated distress during the transgression paradigm. This analysis examined whether the laboratory transgression elicited affective reactions in children similar to their typical distress following transgressions. Thus, only children in one of the two conditions involving a transgression (experimental, no-video control) were included in the analyses. The *My-Child* AD scale was positively and significantly correlated with children's rated distress during the study paradigm, $r = .40, p = .02$.

3.3 Tests of Study Hypothesis.

Tests of the hypotheses involved examining the effect of condition on target acts scores and conventional acts ratings (Figure 3).

3.3.1 Target acts.

First, condition differences in target acts scores were examined to investigate children's imitation of the demonstrated prosocial behaviors using the novel prosocial objects. Assumptions of ANOVA were tested. Target acts scores were not normally distributed for the no-distress control condition condition, $D(18) = .51, p = .00$, the no-video control condition, $D(18) = .54, p$

¹ Chi square analyses were conducted on each of the other two child questions and also revealed no significant effect of condition on children's report of their perceived fault.

= .00, or the experimental condition, $D(18) = .48, p = .00$, as assessed by the Kolmogorov-Smirnov test of normality. Square root, logarithmic, and inverse transformations on the target acts dependent variable were attempted. The distributions were still significantly different from normal following transformations. Thus, a non-transformed dependent variable was used in subsequent analyses. There were several ($n = 6$) outliers in the data (3 in the experimental condition, 2 in the no-distress control condition, and 1 in the no-video control condition), as assessed by cases with standardized residuals greater than ± 3 standard deviations. However, as these outliers represent genuine data points (e.g., the only five children who produced any target acts), there is no reason to reject them as invalid; thus, they were not removed. There was homogeneity of variances, as assessed by Levene's test of homogeneity of variance, $F(2,51) = 2.22, p = .12$). As assumptions of ANOVA were violated, the Kruskal-Wallis H Test was used. The test revealed no significant effect of condition (experimental, no-video control, no-distress control) on the target acts score², $\chi^2(2) = 1.12, p = .571, \eta^2 = .02$. Table 7 displays the number of children in each experimental condition who displayed any target acts (i.e., received above a score of 0).

Table 7. Number of Children who Produced Target Acts

	Overall Sample	Experimental	No-video control	No-distress control
Pain Trial	3	2	1	0
Sadness Trial	3	1	0	2

3.3.2 *Conventional acts.*

Second, the conventional acts ratings were examined to investigate children's use of other, non-demonstrated prosocial acts during the test phase. Assumptions of ANOVA were

² Analyses conducted on the pain and sadness trials separately revealed the same findings.

tested. Conventional acts ratings were normally distributed for the for the experimental condition, $D(18) = .16, p = .20$, and the no-video control condition, $D(18) = .11, p = .20$, but not the no-distress control condition, $D(18) = .52, p = .00$, as assessed by the Kolmogorov-Smirnov test of normality. Square root, logarithmic, and inverse transformations on the conventional acts dependent variable were attempted. The distribution of the no-distress control condition remained significantly different from normal following transformations. Thus, a non-transformed dependent variable was used in subsequent analyses. There were no outliers in the data, as assessed by no cases with standardized residuals greater than ± 3 standard deviations. There was not homogeneity of variances, as assessed by Levene's test of homogeneity of variance, $F(2,51) = 14.23, p < .01$. As assumptions of ANOVA were violated, the Kruskal-Wallis H Test was used.

The mean rank of conventional acts ratings was statistically significantly different between conditions³, $\chi^2(2) = 31.96, p < .001, \eta^2 = .60$. Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. This post hoc analysis revealed statistically significant differences in conventional acts ratings between the experimental (mean rank = 38.98; $p < .001$) and no-distress control (mean rank = 10.78) conditions, and no-video control (mean rank = 36.76; $p < .001$) and no-distress control conditions, but not between the experimental and no-video control conditions. Thus, children in a condition involving the transgressor script engaged in significantly greater conventional acts than children in the no-distress control condition.

³ Analyses conducted on the pain and sadness trials separately revealed the same findings

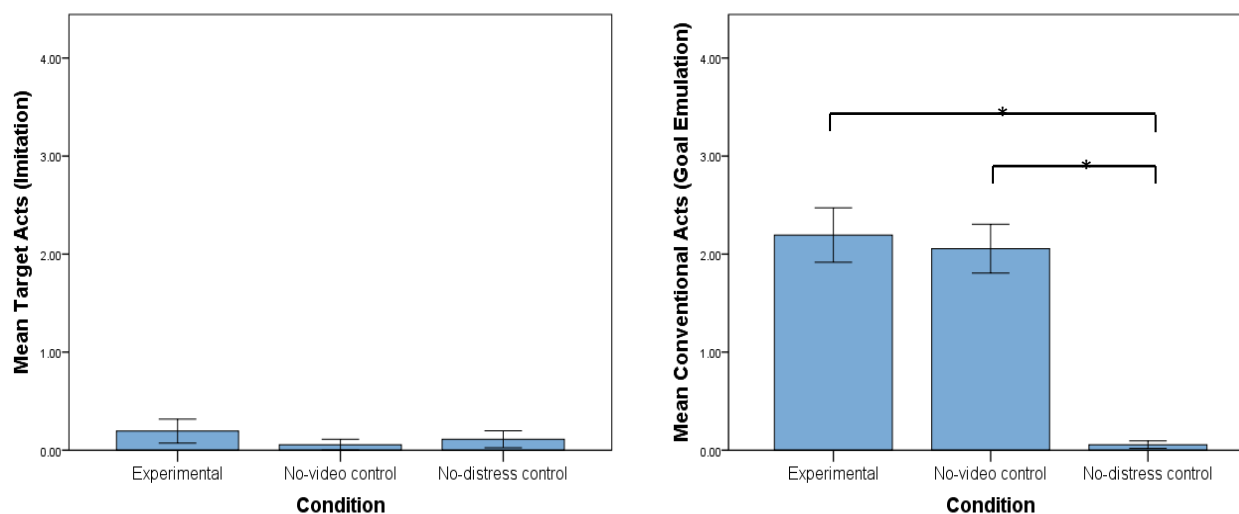


Figure 3. Mean (\pm SE) target acts scores (A) and mean (\pm SE) conventional acts ratings (B) as a function of experimental condition. * $p < .05$.

4 DISCUSSION

The purpose of the current study was to investigate children's social learning of prosocial behaviors for use in a transgressor context using a novel methodology in which children were led to believe that they had caused their parent's pain and sadness. While our previous work demonstrated that children can learn a prosocial behavior to help another in pain through imitating and emulating the goal of the model's example (Williamson et al., 2013), no previous study had investigated children's social learning of prosocial behaviors when children have transgressed to cause another's distress. Children in this study who were led to believe that they had transgressed to cause their parent's distress engaged in significantly more frequent and sophisticated non-demonstrated prosocial behaviors than children who witnessed their parent engage in a neutral activity. However, we found no evidence supporting children's ability to imitate the novel helping behaviors in the transgressor context, and there was no evidence of goal

emulation (achieving the goal of the prosocial demonstration—alleviating a victim’s distress) as children’s use of previously learned prosocial behaviors to help a distressed parent did not differ significantly depending on whether or not they first watched the prosocial demonstration video. Before interpreting the primary analysis, findings related to the study design are discussed.

4.1 Validity of the transgression paradigm.

Three manipulation checks were used to establish the ecological validity of the transgression paradigm in the laboratory. First, children who tend to be more distressed following transgressions in naturalistic settings (assessed by parent report) also displayed more distress affect during the transgression paradigm. Second, parents of transgressor children made significantly higher ratings of children’s perceived fault than parents of children who were not led to believe that they had transgressed. Third, transgressor children themselves were no more likely to report fault than children who were not led to believe that they had transgressed; however, children may not be accurate reporters of their personal responsibility for transgressions. Children’s shame following transgressions is associated with their avoidance and denial of fault (Barrett et. al., 1993); thus, it is likely that some transgressor children did not respond to fault questions or reported that they were not at fault due to avoidance and denial rather than failure to understand their responsibility for the transgression.

The current study provides indications that children believed that they were at fault for the transgressions. Utilizing manipulation checks such as parent report was novel, as previous studies have tended to simply assumed children’s understanding of fault (Barrett et al., 1993; Cole et al., 1992; Kochanska et al., 1995, 2002). Understanding fault is a challenging developmental task, as studies suggest that toddlers are at times confused about whether or not they caused another’s distress in the context of complex interpersonal interactions (Zahn-Waxler

& Radke-Yarrow, 1990). However, toddlers possess the cognitive ability to understand when they are at fault, as children understand intentionality and their role as causal agents by age two (Kagan, 1984; Piaget & Cook, 1952; Stipek, Gralinski, & Kopp, 1990). Therefore, studies that utilize paradigms in which children's transgression is experimentally manipulated should test rather than assume children's understanding of fault.

4.2 No effect of condition on children's imitation or goal emulation.

Contrary to expectations, children who saw the prosocial demonstration video and were led to believe they transgressed were not more likely than children in either control condition to replicate the demonstrated novel helping behavior. Thus, children in this study did not imitate a prosocial demonstration in a transgressor context. This surprising lack of effect suggests that it is markedly difficult for children to imitate a prosocial behavior when they have transgressed to cause another's distress. Children who were led to believe they transgressed were significantly more likely to engage in previously learned prosocial behaviors than children who did not transgress but witnessed their parent engage in a neutral activity. However, among transgressor children, ratings of previously learned prosocial behaviors were not significantly different depending on whether or not the child watched the video; thus, there was no evidence of goal emulation, as the demonstration of a novel helping behavior did not encourage more previously learned prosocial behaviors than what children produced at baseline.

These lack of differences suggest that modeling was not an effective means for promoting children's newly or previously learned prosocial behaviors in a transgressor context; instead, other practices may be more effective. Mother's use of inductive reasoning and an authoritative parenting style have been associated with children's increased reparative prosocial responding (Kochanska, 1991; Zahn-Waxler et al., 1979). Studies have found associations

between increased altruistic prosocial behaviors and several additional socialization processes, such as secure early attachment, maternal sensitivity and responsiveness and emotion socialization practices (e.g., Brownell et al., 2013; Eisenberg & Fabes, 1998; Kiang et al., 2004). Studies should examine whether these socialization processes are also related to children's greater use of *reparative* prosocial behaviors. Further, the current study is the only study to test a *causal* mechanism for learning reparative prosocial behaviors; experimental designs should be employed to test other potential causal mechanisms. Mechanisms that do not necessarily involve socialization may also be implicated; for example, fostering children's better emotion regulation during distressing transgressions may facilitate their reparative responding.

While we anticipated that children's imitation and emulation of the goal of a prosocial behavior might be more difficult in a transgressor context, the extremely low rates of children's imitation were unexpected given the large effect size ($f=.766$) of children's prosocial imitation in a bystander context in our previous, published study (Williamson et al., 2013). Children's engagement in previously learned prosocial acts in the current study was frequent and sophisticated; in fact, we modified the coding system used in our published study (e.g., to a 5 versus 3 point scale with stricter thresholds per code) as it was clear that children were engaging in more frequent and sophisticated non-demonstrated prosocial behaviors in the transgressor context. The high rates and sophisticated use of previously learned prosocial behaviors was unexpected given that most research has demonstrated that children are less prosocial as transgressors than as bystanders (Dunn & Brown, 1994; Dunn & Munn, 1986; Zahn-Waxler et al., 1979; Zahn-Waxler, Radke-Yarrow, et al., 1992). This research has solely compared rates of children's prosocial responding to *peers* between bystander and transgressor contexts; children may be more motivated to repair a transgression involving a parent's rather than a peer's distress

given the central role that parents occupy in young children's worlds as well as research indicating that distress in parents is often upsetting to children (Cummings, Iannotti, & Zahn-Waxler, 1985; Solantaus-Simula, Punamäki, & Beardslee, 2002).

Children often experience guilt and shame as transgressors (Kochanska et al., 2002), and the distress children experienced in this study likely included these self-conscious emotions among other distress emotions. Self-conscious emotions may have motivated children's use of previously learned prosocial behaviors while simultaneously interfering with their use of newly learned prosocial behaviors. Guilt, which is thought to motivate children's reparative responding (Zahn-Waxler & Radke-Yarrow, 1990), may have motivated children to act prosocially using previously learned prosocial behaviors. While shame-relevant behaviors such as avoidance, withdrawal, and denial may inhibit young children's ability to act prosocially in a transgressor context (Barrett, Zahn-Waxler & Cole, 1993), children's impressive engagement in previously learned prosocial behaviors suggests that children were largely engaged with their parent rather than in avoidance or withdrawal. At the same time, it is possible that self-conscious emotions overwhelmed children such that they were unable to imitate a newly learned prosocial act. Reproducing novel acts through imitation is more cognitive taxing than is utilizing previously learned behaviors (Killen & Uzgiris, 1981; Masur & Ritz, 1984; McCabe & Uzgiris, 1983) and may thus be more vulnerable to the interference of strong emotions. The current study utilized a deferred (rather than immediate) imitation task that was particularly cognitively demanding as it involved both learning and nonverbal memory (Meltzoff, 1988). Self-conscious emotions or children's more generalized experience of stress (i.e., emotional and physiological reactions to aversive stimuli; Storbeck & Clore, 2014) during the paradigm may have impacted the process of retrieving the newly learned prosocial skill from memory. Indeed, empirical evidence suggests

that stress during both consolidation and retrieval impairs memory performance (Smeets, Otgaar, Candel, & Wolf, 2008; Trammell & Clore, 2015). While there was no relationship between rated distress and imitation, it is possible that some children experienced internal distress that was not observable in facial expressions or nonverbal behavior, and was thus not captured by our distress coding.

The transgression paradigm elicited both high levels of engagement in previously learned prosocial behaviors as well as high levels of distress. Thus, it appears that a context in which children believe they caused a parent's pain or sadness is a "high stakes" situation. The most fitting explanation for the data may be that when the stakes are high, children fall back on previously learned, previously successful behaviors rather than attempting a newly learned behavior. In other words, children may have used tried and true strategies rather than a riskier newly learned strategy to repair the all-important parent-child relationship. Children's willingness to act prosocially depends on their degree of self-efficacy, or belief in their ability to help (Bandura, 1977). Children may be more confident in their ability to competently use previously effective, rather than new prosocial strategies—especially in contexts in which successfully relieving distress feels particularly imperative.

Changes in methodology from our previous study (Williamson et. al, 2013) may also partially explain the lack of imitation in the transgressor context. First, in contrast to the previous study, the current study required children to generalize slightly from the video demonstration to the mishap. For example, during the pain trial, children watched a video demonstration of a hurt hand, and the parent subsequently simulated a hurt finger. It is possible that toddlers are unable to imitate a prosocial skill in a situation that is not an exact match to that of the demonstration. However, as the mishaps differed only slightly from the demonstrations, it does not seem likely

that this explanation alone can account for the difference in effects across the two studies.

Second, in contrast to the previous study, the transgressions involved items (e.g., the pounding toy and picture frame) which may have distracted children. However, this explanation also seems unlikely as the majority of children stopped playing with the items in order to tend to their parent's distress—they simply typically did so using previously learned prosocial behaviors.

In sum, the stark contrast of children's low rates of prosocial imitation in a transgressor context to their high rates in a bystander context (Williamson et al., 2013) provides evidence that a transgressor context is clearly distinct from a bystander context and may be developmentally important. Indeed, whether or not children are at fault for causing a victim's distress appears to greatly impact children's learning, behaviors, and perhaps their emotions. Existing studies have tended to make claims about both reparative and altruistic prosocial behaviors based on designs that almost exclusively examine children's prosocial responding in bystander contexts. The current study suggests that investigations must specifically examine children's responses to transgression rather than assuming that findings from bystander contexts will generalize to transgressor contexts. Finally, the data points to a need to elucidate possible reasons that applying a newly learned prosocial behavior appears strikingly difficult for children in a transgressor context. In particular, the shame and guilt that such transgressions often cause may create a high stakes, emotionally laden context that also makes applying newly learned behaviors difficult.

4.3 Summary

The current study presents a novel and valid paradigm through which children's responses to transgressions against their parent were examined. We found no indication that children are able to imitate a prosocial demonstration when they are led to believe that they have

caused their parent's distress. Instead, children engaged in other, non-demonstrated prosocial behaviors. Seeing a prosocial demonstration did not increase children's use of these previously learned prosocial behaviors above baseline, suggesting that there was also no evidence of children's emulation of the goal of a prosocial demonstration in this transgressor context.

4.4 Limitations

Several limitations of the study should be noted. It is always possible that laboratory paradigms may appear artificial to some children; however, children's behavioral and affective responses to the paradigm suggests that it was realistic to the majority of children. Similarly, children watched the video demonstration and then immediately encountered a parent in distress; it is unlikely that children have opportunities to display prosocial behaviors immediately following modeled prosocial demonstrations in the natural environment. While utilizing strange novel acts was necessary in order to measure new learning, it is possible that children may have been more able to utilize novel prosocial behaviors if these demonstrated acts had more face validity as a means of helping (e.g., were less strange). Children were assessed at one time point only, leaving questions about children's imitation and goal emulation after repeated exposure to prosocial demonstrations, which is how learning typically occurs in the natural environment, that cannot be answered by the current study. The PI served as the master coder for the outcome variables; using a master coder who was blind to study hypotheses may have decreased the likelihood of bias in coding. Similarly, raters could not be completely blind to condition, as the content of the coded test period differed depending on condition (i.e., one condition involved a neutral interaction rather than transgressions). Results from children's report of their perceived fault included a large amount of missing data and likely tapped constructs such as guilt and shame rather than children's understanding of fault; future studies should design a different self-

report measure. Finally, the sample was predominantly Caucasian and parents were, on average, highly educated. Studies with samples of differing demographic characteristics will be important for understanding the generalizability of the current study's lack of effect.

4.5 Future directions.

This study indicates several directions for future research. Future studies should directly compare children's social learning of a prosocial behavior in a transgressor versus a bystander context using items during the test period as well as videos that require children to generalize from the video to the transgression paradigm. Such investigations will elucidate whether methodological differences between the current study and our previous, published study contributed to the disparate findings or if children can imitate and emulate the goal of a prosocial demonstration in a bystander but not a transgressor context. Studies should examine whether children will imitate a prosocial demonstration in a transgressor context after viewing the demonstration multiple times, which may increase children's confidence in the effectiveness of the novel behavior.

The focus of the study was behavioral and did not aim to study children's affective responses to the transgressions. However, the transgression paradigm evoked emotional responses akin to those elicited by children's everyday transgressions; thus, this paradigm should be used to answer questions about children's emotions following transgression. First, while there was no association between children's distress and their prosocial behaviors, future studies should examine this relationship in larger samples and using both behavioral and psychophysiological measures of children's reactivity to uncover any present associations. Such studies would enable an examination of the impact of distress on children's learning of and memory for a new skill as well as children's use of previously learned prosocial behaviors.

Quadratic associations between children's distress and their prosocial behaviors should be examined, as distress may be optimally motivating at moderate levels, and studies should distinguish between distinct types of distress, such as empathic versus personal (e.g., self-oriented) distress responses. Second, studies should examine the potential role of guilt and shame in a) impairing children's prosocial imitation and/or b) motivating children's use of previously learned prosocial behaviors in a transgressor context. Finally, the practical importance of this research centers on findings indicating that chronic, unalleviated guilt is associated with greater depressive symptoms in very young children, and that reparative behaviors help alleviate guilt. Thus, future studies should examine associations between children's maladaptive guilt and shame and reparative behaviors following transgressions and children's internalizing problems, both concurrently and over time.

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APPENDICES

Appendix A: Target Acts Coding Manual

Child receives 1 point for performing each of the following actions. If a child attempts an action but cannot execute it correctly, the child receives partial credit for the action. For example, if it appears that the child is trying to put on the cleaning mitt but is physically unable to do so, the child would get credit for this attempt as well as subsequent actions (e.g., patting the parent's head while holding the mitt in hand).

Score each of the following actions with: 0= not present/no attempt, 0.5= unsuccessful attempt, 1= successful attempt.

Cleaning mitt demonstration (physical pain trial):

1. Intentionally touches **parent** with mitt
2. Touches **parent** with mitt using patting action
 - If the child touches the parent with the mitt, count it as the pat. The action in the video demonstration that they are imitating is a very slow pat, so it looks like alternating touches.
 - The “touches parent with mitt using patting action” and “touches parent with duster using running action” are meant to weed out children who are aggressive with the mitt (e.g., hitting). Be liberal about what counts as a pat or a run. If it's close, count it.
3. Touches **parent** with mitt on correct body part (head)
4. Touches **parent** in an alternating fashion (palm up and palm down)
 - For determining whether the child “flips” the mitt, focus on whether the child flips their hand rather than on which side of the mitt touches the parent.
 - Child gets credit even if it's only one flip (not multiple like the demonstration video)
5. Uses any vocalization while touching **parent** with mitt
 - Remember that the child must say the vocalization while touching the parent.
 - Remember NOT to count the child speaking words as a vocalization (the other coding team is responsible for this).
6. Uses the correct vocalization (“eee, eee”) while touching **parent** with mitt
 - We will give the child a point if they use the correct (or *very* nearly correct) vocalization even one time. Be careful to listen to what the vocalization really is. If it is not the exact

vocalization and it seems consistent with other noises in the 1 minute clip, it might not be counted.

-Child gets credit if only make vocalization once

Blind duster demonstration (sadness trial):

1. Intentionally touches parent with duster
2. Touches **parent** with duster using running action
 - The “touches parent with mitt using patting action” and “touches parent with duster using running action” are meant to weed out children who are aggressive with the mitt/duster (e.g., hitting). Be liberal about what counts as a pat or a run. If it’s close, count it.
3. Touches **parent** with duster on correct body part (arm)
4. Touches **parent** with duster down alternating arms of parent (left and right)
5. Uses any vocalization while touching **parent** with duster
 - Remember that the child must say the vocalization while touching the parent.
 - Remember NOT to count the child speaking words as a vocalization (the other coding team is responsible for this).
6. Uses the correct vocalization (“ahh, ahh”) while touching **parent** with duster
 - We will give the child a point if they use the correct (or *very* nearly correct) vocalization even one time. Be careful to listen to what the vocalization really is. If it is not the exact vocalization and it seems consistent with other noises in the 1 minute clip, it might not be counted.

Notes:

1. Remember to be careful about coding the exact minute of the tape listed. The child might do something with the item one second after the time period has ended, and we don’t want to code that (and we don’t want some of us coding it and some of us not, it will make us unreliable)
2. Remember that a score of .5 means the child attempted an action but was physically unable (e.g., physically unable to put hand inside mitt, *looks like is clearly intending to touch parent’s head (or arm) but cannot reach*)
3. A child simply handing the mitt or duster to the parent should NOT be counted as intentionally touching parent. Intentionally touching parent code is intended to indicate that the child acted on the parent (e.g., they used the item on the parent). The other coding team will handle coding children simply handing the items to the parent.

Steps for coding videos:

1. Open your individual coding sheet (password protected). This contains your video assignments and is also where you will record and save your ratings.
2. First, watch “full view” video for the folder you are working on. This will give you a sense of whether the child acted on the parent at all.
3. Make any ratings you could see from watching the full video. Write any notes about anything that impeded your ability to code or any questions you have for meetings in the spaces provided on the coding sheet.
4. Watch “big view” and make additional ratings based on anything new you could see from this view. Repeat this for “small view.”
5. Please note that you may need to watch videos multiple times to get an accurate rating for the videos. Remember that we are aiming to be as detailed as possible and come up with the exact same ratings as one another.

Appendix B: Conventional Acts Coding Manual

Coding steps:

1. Rate the overall quality of all of the child's prosocial behaviors using "Prosocial Behaviors" coding, page 2. This should be a global rating of your overall impression of how prosocial the child was during the entire interaction.
2. Rate the child's overall distress during the entire interaction using "Distress Coding," page 6.

Prosocial Behaviors Coding – efforts to help or comfort parent or to provide resources to parent. Behaviors should have a prosocial intent.

- Examples of prosocial behaviors include:
 - **Apology**
Statement of sorrow for wrongdoing.
e.g., "I'm sorry," "Didn't mean to"
 - **Confession**
Admission of responsibility for wrongdoing.
e.g., "I hurt your finger," "I broke your present"
 - **Comforting/reassuring statements**
Statements to comfort or reassure the parent.
e.g., "You're all better" "I love you"
Children often make verbalizations while helping or giving physical affection (e.g., they often say, "I'll fix it" or "I'll kiss it")
 - **Information seeking questions**
Questions seeking information about parent's distressed state/feelings.
e.g., "Are you ok?" "You're very sad?"
 - **Physical affection**
Child attempts to soothe parent through physical affection.
e.g., hugging, kissing, or patting any part of parent
Note: Child may touch parent with an item such as the hammer as an unsophisticated method of physical touch.
 - **Helping/repair attempts**
BEHAVIORS
-Child attempts to repair either *hurt finger* or *broken frame* (i.e., not the parent's feelings about the hurt finger or broken frame) typically accompanied by action.
e.g., for blocks trial - attempting to retrieve bandaid
e.g., for frame trial- attempts to fix frame; shows repaired item to parent
VERBAL
-Could also be a verbal suggestion of how to help. You should get the sense that the repair attempt is being made to help the parent (and not, for example, just a preoccupation with a broken object).

e.g., asking if parent needs a bandaid, asking to see parent's finger, suggesting that the parent fix the frame or rub her own finger. These are typically considered somewhat less sophisticated because child could act to try to help and is choosing to talk about it instead.

-Child may make some verbal statements about the novel objects (mitt & duster).

e.g., "This will make you feel better." (in reference to the item) "Just pat on your head with this"

- **Hands novel object to parent**

Child hands the green mitt or blue blind cleaner to parent, or otherwise gives it to parent (e.g., puts it in her lap). You will assess whether or not this action has prosocial intent.

- **Other behaviors**

Child's behaviors that do not fall within a listed category.

-Some of these I've seen include: attempts to distract the parent, attempts to make parent laugh, aggressive behaviors

- Note about the child's use of **prosocial object (mitt or blind cleaner)**:

- Do NOT include child's use of the object to act ON parent when making prosocial rating.

- Include any verbal statements made by the child while acting on parent with the object when making your rating, as well as verbal statements made by child about the prosocial object helping the parent.

(e.g., "This will make you feel better." "Just pat on your head with this")

How to make your rating:

Factors to consider:

- **Throughout what percentage of the interaction is the child prosocial?**

-Consider both frequency of behaviors (how many times does the child act) as well as duration of behaviors (when child acts, how long does each behavior last?).

-Consider frequency and duration together. The child does not need to have both in order to be acting throughout the majority of the interaction. (For example, the child may do one, long drawn out helping behavior which might rate just as highly as multiple, shorter behaviors).

- **Sophistication of behaviors**

-i.e., Are child's prosocial attempts advanced? Does the child's behavior display good understanding of parent's distress and what they can do to help?

-Consider the variety of behaviors used by the child. Using a variety of behaviors should help increase your mental rating of sophistication. For example, you may get the sense that child is trying different behaviors to see if one will "work" (for example, after making an attempt and seeing that parent is still distressed, child tries a novel behavior); however, child's attempts may be sophisticated without using a variety of behaviors.

(Typically, using a variety of behaviors will mean that you'll increase your idea of how sophisticated the child is, but there may be instances where child can gain a sophisticated rating without variety.)

-To help you make a decision between ratings: Consider whether child is

-A) focusing on mom while engaging in prosocial behaviors (more sophisticated) or not focusing on mom while engaging in prosocial behaviors (e.g., hammering, occupying self- less prosocial)

-B) seems concerned for mom, or concerned in relieving own self-distress while acting

-C) If all else fails, choose higher rating

-If you are between two ratings, weigh sophistication more highly than frequency/duration in order to determine which rating the child should receive.

Use the following scale to make your rating:

0 = none

1 = minimal or unclear

2 = somewhat

3 = moderate

4 = strong

Prosocial Behaviors Chart

Please use the chart below to help you make your overall prosocial behaviors rating.

-You do not have to rely strictly on this chart. your rating should be your overall impression rather than a mathematical calculation.

-Most children will not earn the same rating in each of the three categories. For example, an ideal '3' would mean that the child used more than one clear behaviors throughout the majority of the interaction and the quality of the prosocial actions was moderately sophisticated. However, it is unlikely that all children receiving a 3 will fit this ideal example exactly (for example, if their duration is a 2, you might still give them a 3 overall if their behaviors were moderately sophisticated). Focus on giving a rating for each category that fits the child best.

	0	1	2	3	4
Frequency of Behaviors	No Behaviors	1+ category. 1+ behaviors per category.	2+ category. 1+ behaviors per category. OR 1+category. 2+behavior s per category.	2+ categories. 3+ behaviors per category.	3+ categories. 3+ behaviors per category.
Sophistication of Behaviors	Absent	Unsophisticated or unclear whether truly prosocial	Somewhat sophisticated	Moderately sophisticated	Strongly sophisticated
Duration of Behaviors	Absent	Brief Display	Sustained more than briefly	Sustained throughout most of the interaction	Sustained throughout almost the entire interaction

Distress Coding – expressions of distress. Consider facial, vocal, or gestural/postural expressions. Distress may present as different emotions in different children (e.g., one child's distress appears mostly sad, another's looks like anxiety, etc.) Examples of emotions may include concern/anxiety/sadness/anger.

- Factors to consider:
 - **Frequency of distress**
i.e., How many times is there a clear sign of distress?

- **Duration of behaviors**

i.e., Throughout what percentage of the interaction is the child distressed?

- **Intensity of distress**

i.e., Is the distress slight, mild, moderate or extreme (crying)?

If you're having trouble making a choice, you may weight intensity more highly than frequency/duration.

Coding Steps:

1. Rate the child's overall distress throughout the entire interaction using this scale:

0 = absent

1 = minimal or unclear

- > fleeting sobering of expression and/or vocalization with **slight** evidence of distress; change in expression/vocalization but unsure whether distressed

2 = somewhat

- > more than brief sobering of expression and/or vocalization with evidence that child is **mildly** distressed

3 = moderate

- > sobering of expression and/or vocalization sustained throughout the interaction with **moderate** evidence of distress; *may* include whimpers, but does not have to (if there's whimpering or tearing up, give them a 3)

4 = substantial

- > sobering of expression and/or vocalization sustained throughout majority of the interaction with **extreme** evidence of distress; typically includes full blown crying (if there's crying, give them a 4)

Distress Rating Chart

Please use the chart below to help you make a distress rating. You do not have to rely strictly on this chart. your rating should be your overall impression rather than a mathematical calculation, but you may use the chart below to help you make a rating.

	0	1	2	3	4
Frequency of Affect	No Sign of Distress	At Least One Subtle Sign of Distress	At Least One Clear Sign of Distress	More than One Clear Sign	Many clear signs
Intensity of Affect	No Hint of Distress	Slight Display of Distress	Mild display of distressed	Moderate Display of Distress	Extreme display of distress
Duration of Affect	Absent	Fleeting Display	Sustained more than briefly (just intermittently)	Sustained throughout interaction	Sustained throughout majority of interaction

Based on the coding manuals used in Williamson, Donohue, and Tully (2013) and Zahn-Waxler, Cole, Welsh, and Fox (1995).