

Georgia State University

## ScholarWorks @ Georgia State University

---

Psychology Faculty Publications

Department of Psychology

---

2013

### Learning How to Help Others: Two-year-olds' Social Learning of a Prosocial Act

Rebecca A. Williamson

Georgia State University, rawillia@gsu.edu

Meghan R. Donohue

Georgia State University, mdonohue1@student.gsu.edu

Erin C. Tully

Georgia State University, etully2@gsu.edu

Follow this and additional works at: [https://scholarworks.gsu.edu/psych\\_facpub](https://scholarworks.gsu.edu/psych_facpub)



Part of the [Psychology Commons](#)

---

#### Recommended Citation

Williamson, R. A., Donohue, M. R., & Tully, E. C. (2013). Learning how to help others: Two-year-olds' social learning of a prosocial act. *Journal of Experimental Child Psychology*, 114(4), 543-550. doi: 10.1016/j.jecp.2012.11.004

This Article is brought to you for free and open access by the Department of Psychology at ScholarWorks @ Georgia State University. It has been accepted for inclusion in Psychology Faculty Publications by an authorized administrator of ScholarWorks @ Georgia State University. For more information, please contact [scholarworks@gsu.edu](mailto:scholarworks@gsu.edu).

Learning How to Help Others: Two-year-olds' Social Learning of a Prosocial Act

Rebecca A. Williamson, Meghan Rose Donohue, and Erin C. Tully

Department of Psychology

Georgia State University

P.O. Box 5010, Atlanta, GA 30302 USA

Telephone: 404-413-5092, Fax: 404-413-6218

[rawillia@gsu.edu](mailto:rawillia@gsu.edu)

Word Count: 3963

### **Abstract**

Engaging in prosocial behaviors (acts that benefit others) is associated with many positive outcomes in children, including the development of positive peer relationships, academic achievement, and good psychological functioning. This study examines the social learning mechanisms toddlers use to acquire prosocial behaviors. This brief report presents a new experimental procedure in which 2-year-olds (28-32 months,  $N=30$ ) saw a video of an adult performing a novel prosocial behavior in response to another person's distress. The children then had the opportunity to imitate and implement the behaviors in response to their own parent's physical distress. Children who saw the video were more likely to perform the novel action and to display non-demonstrated prosocial behaviors relative to a) children who did not view the video but saw a parent in distress and b) children who saw the video but witnessed their mother engage in a neutral activity. These results suggest that toddlers imitate and emulate prosocial behaviors for social interaction and that children can apply such behaviors in appropriate situations.

**Keywords:** imitation, emulation, observational learning, prosocial behavior, toddlers

### Learning How to Help Others: Two-year-olds' Social Learning of a Prosocial Act

Prosocial behaviors encompass a range of helpful, affiliative, and supportive behaviors that are aimed at benefiting others (Eisenberg & Fabes, 1998). Learning to interact in a prosocial manner is an important and potentially challenging developmental task for young children (Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). Prosocial acts begin to emerge during infancy and increase in number and sophistication through toddlerhood as children learn to cooperate with parents and peers and to provide aid and comfort to people in physical or emotional distress (Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011; Hay & Cook, 2007; Svetlova, Nichols, & Brownell, 2010; Warneken & Tomasello, 2007; Zahn-Waxler et al., 1992). This paper investigates social learning as a means through which two-year-olds acquire these social behaviors.

### **Observational Learning in Toddlers**

Guided by the comparative literature, developmental researchers have identified distinct social learning mechanisms (for review, see Want & Harris, 2002). At a basic level, when children observe another person acting in a particular situation, it may increase their interest to that situation, prompting more trial-and-error learning. This *stimulus enhancement* may lead children to rediscover the model's acts. Children may also *emulate* another's example by learning and reproducing the general outcome or goal that the other person obtained, or *imitate* -- reproducing both the model's outcome and the exact acts the model used to attain that end. It is important to understand which of these learning mechanisms children use in order to pinpoint what they can be expected to learn from a prosocial example.

Beginning in infancy, imitation is an effective way for children to learn how to interact with objects. For example, 14-month-olds who see an adult perform an unusual act reproduce

both the physical outcome with a novel object (turning on a light) and the specific manner used to bring about the outcome (bending and touching with the head; Meltzoff, 1988b). There is also evidence that infants will emulate others' acts. When presented with a tool that was difficult for them to use, 12-month-olds used their hands instead of the tool, even after seeing an adult employ the tool (Nielsen, 2006). Imitation and emulation are powerful learning mechanisms for children; even infants can learn others' body movements, acts on objects, and sequences of behaviors from live demonstrations (Barr, Dowden & Hayne, 1996; Bauer & Mandler, 1992; Carpenter, Akhtar, & Tomasello, 1998; Meltzoff & Moore, 1977) or from video (e.g. Barr & Hayne, 1999; Meltzoff 1988a).

### **Social Learning of Prosocial Behaviors**

Past studies indicate that others' examples influence children's prosocial and antisocial behaviors. A classic example of the uptake of antisocial behaviors comes from Bandura's bobo-doll studies, in which 3- to 5-year-olds show increased and novel forms of aggression after witnessing adults' aggressive behaviors (e.g., Bandura, Ross, & Ross, 1961, 1963). Similar methods demonstrate children's use of prosocial examples; preschoolers who saw an adult demonstrate caretaking behaviors increased their general nurturing behaviors toward a sick child (Gray & Pirot, 1984). Furthermore, kindergarteners were more likely to help a distressed peer after hearing an adult's attempt to comfort the child, particularly when the adult first interacted with the participant in a nurturing way (Staub, 1971). In a longitudinal study, Zahn-Waxler, Radke-Yarrow, and King (1979) found that 1.5- to 2.5-year-olds were more likely to respond to others altruistically if their mothers frequently explained or otherwise addressed others' distress, demonstrating the importance of everyday examples on children's prosocial behaviors.

Live prosocial examples are likely more effective (Rushton & Owen, 1975), but children also have been shown to learn from videoed examples (e.g., Bandura, 1965; for review, see Calvert, 2006). Kindergarteners who saw a prosocial television show in which friends tried to help and understand a character's feelings were more likely to later help a puppet and another child than were children who saw only neutral content (Friedrich & Stein, 1975). Indeed, a meta-analysis of studies supports consistent benefits of prosocial television content on social behaviors, particularly altruism, relative to viewing antisocial or no video content (Mares & Woodard, 2005).

Although this past work indicates that others' prosocial examples influence children's behaviors, it is not clear through what social learning mechanism modeling has its effect. Most studies have examined whether children increase anti- and prosocial responding of any type (e.g. general nurturing responses) after seeing a model's example. These studies support learning prosocial acts through processes akin to emulation. However, children might also learn specific prosocial strategies from imitating a model's example; a child may know to apply a band-aid to a friend's cut after seeing her mom do this when her brother was hurt. The current experiment tests for both imitation and emulation in young children's social learning of a prosocial behavior.

The specific purpose of this project is to determine what social learning mechanism(s) 2-year-olds' use to reduce parents' distress, a situation with particular salience for young children (Cole, Barrett, & Zahn-Waxler, 1992; Hastings, Rubin, & DeRose, 2005). We chose this age group due to changes in the use and sophistication of prosocial behaviors during the third year of life; prosocial behaviors become increasingly selective and spontaneous, are prompted by less explicit distress cues, and are more governed by social conventions (Hay & Cook, 2007; Svetlova, Nichols, & Brownell, 2010). In this experiment, the 2-year-olds saw one adult use an

object in a novel manner to ease the physical pain of another adult. Then, children were presented with a similar situation – a parent bumped his or her knee and displayed distress. We tested whether children would a) imitate the acts the adult used to alleviate the parent's distress and/or b) emulate by using other, conventional acts (e.g., giving a hug) to produce the same outcome.

## **Method**

### **Participants**

Thirty 2.5-year-olds ( $M = 2.52$  years, 28-33 months; 20 males) were recruited through a university's participant list. According to parental report, the sample was 67% white, 20% Black/African American, and 3% Pacific Islander, with 10% not reporting. The sample was generally middle- to upper-middle class. Six additional children's data were excluded due to experimenter/parent error (5) or an unwillingness to participate (1).

### **Materials**

A blue cleaning mitt (24 cm x 18.5 cm) with multiple one-inch cloth tentacles covering one side (see figure 1A) was used in a novel prosocial act. This unusual object was chosen as something that a) children were unlikely to recognize, b) children would not have previously used in a prosocial context, and c) could feasibly be used to comfort a person.

A 51-second video-recorded vignette (presented on a 9-inch screen) introduced the novel prosocial behavior. In the video, two adults sat at a table coloring pictures. One actor bumped her knee. She demonstrated a facial expression of pain, rubbed her knee, and stated, "Oh. Ow. I banged my knee. It really hurts." The second actor said, "I'll help you." He put the blue mitt on his hand, leaned over, and patted the first actor's head with the mitt four times, first with palm-

down and then with palm-up in an alternating fashion (see figure 1B). The first actor then settled, and said, “I feel better now.” The two actors returned to coloring.

Two procedures were developed to guide parents' behaviors. For the physical distress procedure, parents stood up, pretended to bump their knee, bent to rub their knee, and feigned distress while stating specific phrases from a short script (“Oww! I banged my knee. It hurts. Oww.”) For the neutral procedure, parents stood up, pretended their shoe slipped off, bent to fix it, and used a neutral tone as they stated phrases from a script (“Oh. I need to fix my shoe. It’s off. Oh.”). The pain and neutral scripts were matched for approximate duration, body position, and vocalizations. Parents referred to the scripts during the test session.

### **Procedure**

Children were tested individually in a university lab room, and their behavior was video-recorded. Each child was randomly assigned to one of three groups (experimental, no-video control, no-distress control). A researcher reviewed the appropriate procedure with the parent (physical distress or neutral) and described when during the session the parent would act out the scenario.

**Experimental group.** Children first watched the video of the prosocial interaction. Immediately following the video, an experimenter placed the mitt on the table in front of the child and then left the room. The parent of the child followed the physical distress script.

**No-video control.** Children did not see the video. The experimenter simply placed the mitt on the table in front of the child and left the room. This was the first time the child had seen the mitt. Then the parent presented the physical distress script. This condition assessed children’s spontaneous prosocial responses and use of the mitt when confronted with a parent in pain.

**No-distress control.** This control group tested whether target behaviors in the experimental group were produced only for prosocial ends. As in the experimental group, the children watched the video and the experimenter placed the mitt in front of the child on the table before leaving the room. However, during this test phase, the parent engaged in the neutral script.

In sum, children in the experimental group saw both a) the video and b) the parent's distress. The children in the control groups saw only one of these. The children in no-video control did not see the video but witnessed the parent's distress, and those in the no distress control saw the video but did not see the parent's distress.

### **Dependent Measures and Scoring**

Research assistants who were blind to whether the child watched the video scored the children's behaviors and parents' expressions of pain from videos. The test phase was defined as a 30-second period beginning when the parent started to act out the appropriate script (physical pain or neutral). Two measures of prosocial responding were rated from the videos. The *target acts* score was used to measure production of the demonstrated prosocial act (imitation), and the *conventional acts* score measured production of other, non-demonstrated prosocial acts (emulation). Two additional measures (parental displays of pain, time off video) were scored to evaluate the control conditions.

**Target Acts.** Children's production of the target acts during the test phase was scored on a three-point scale. In all groups, children received one point for wearing the mitt, one point for performing the demonstrated comforting behavior (patting the parent with the mitt), and one point for using the demonstrated style of action (rotating the mitt from palm-down to palm-up). This scheme was designed to give children some credit for partial fulfillment of the target act.

**Conventional Acts.** Children's attempts to relieve distress during the test phase were also scored for all groups<sup>1</sup>. This measure focused on the use of other, not-demonstrated means of helping or comforting (e.g., hugging the parent, asking if the parent needed a band-aid, using statements of concern or affection). The presence and intensity of these behaviors were rated on a 3-point scale (0=*none/minimal*, 1=*moderate*, 2=*strong*), based on one used by Zahn-Waxler, Cole, Welsh, & Fox (1995).

**Time off video.** As a measure of their attention to the video, the length of time the children spent looking away from the 51-second video was recorded for the two groups that watched the video.

**Parental displays.** For the two groups using the physical distress procedure, parents' expressions of pain during the test phase were rated (based primarily on tone of voice) using a 4-point scale, from no evidence of pain to strong evidence of pain.

**Reliability scoring.** Scoring agreement was assessed by comparing scores of two coders for a randomly selected subset of at least 25% of the children. The inter-rater reliabilities were strong for the target acts score; Intraclass Correlation Coefficient (ICC)=1.00; conventional acts score, ICC=.74; time off video duration, ICC=.82; and ratings of parents' pain, ICC=.82.

## Results

Preliminary analyses showed no significant effects of child's gender on the target acts, conventional acts, ratings of parent's pain, or time off video scores. We collapsed across this factor for subsequent analyses. Even though the children were randomly assigned to a group, we performed checks for systematic differences in children's attention to the video and parental affect during the distress procedure. A *t*-test showed no significant difference in the amount of time children in the experimental group ( $M = 3.2s$  of 51s,  $SD = 4.5$ ) and the children in the no-

distress control ( $M = 7.4s$ ,  $SD = 7.5$ ) looked away from the video,  $t(18) = 1.51$ ,  $p = .15$ ,  $d = .71$ , suggesting the two groups were equally attentive to the video. Ratings of parents' pain were also not significantly different in the experimental ( $M = 1.80$ ,  $SD = .92$ ) and no-video control ( $M = 1.80$ ,  $SD = .92$ ) groups [ $t(18) = 0.00$ ,  $p = 1.00$ ,  $d = .00$ ], indicating that expressions of distress did not vary as a function of group.

Tests of our hypotheses involved analyzing children's responses to their parents during the test phase of the experiment. First, we examined the target act score to investigate children's imitation of the prosocial behavior demonstrated in the video. A between-subjects ANOVA showed a significant effect of group (experimental, no-video control, no-distress control) on target act score,  $F(2, 27) = 5.23$ ,  $p = .002$ ,  $\eta^2 = .37$  (see Figure 2A). Tukey's Honestly Significant Difference (HSD) test showed that the children in the experimental group had significantly higher target act scores than did children in either the no-video [ $M_{\text{Diff}} = 1.20$  ( $SE = .37$ ),  $p = .008$ ] or no-distress [ $M_{\text{Diff}} = 1.30$ (.37),  $p = .004$ ] control groups. There was no significant difference in the target act scores in the two control groups [ $M_{\text{Diff}} = 0.10$ (.37),  $p = .96$ ].

---

Insert Figure 2 about here.

---

Non-parametric statistics support these results. Half of the children in the experimental group (50%,  $n = 5$ ) received a score of 2 or more during the test period, thus reproducing at least two target acts (wearing the mitt, patting the parent, rotating the mitt). In contrast, none (0%;  $n = 0$ ) of the children in either control group scored above a 1. Indeed, the only target act that the children in the control groups ever produced was to wear the mitt. Fisher's Exact tests indicate a

significant difference in the number of children who scored two or more versus less than two between the experimental group and each control group,  $p = .03$ .

We also examined children's use of non-demonstrated acts to comfort the parent. There was a significant effect for group predicting ratings of children's production of conventional acts,  $F(2, 26)=4.73, p=.018, \eta^2=.27$  (See Figure 2B). Tukey's HSD test indicated that children in the experimental group produced significantly more conventional acts than children in the no-distress control [ $M_{\text{Diff}}=1.09 (.37), p=.02$ ] and more than children in the no-video control at a level that approached significance [ $M_{\text{Diff}}=0.80 (SE=.36), p = .09$ ], and there was no difference between the no-video and no-distress control groups [ $M_{\text{Diff}}=0.29 (.37), p=.72$ ].

Non-parametric statistics support this pattern of findings. Sixty percent of the children in the experimental group ( $n = 6$ ) earned a score of two (strong presence and intensity) on the conventional acts scale, whereas very few children in the no-video (20%;  $n = 2$ ) and no-distress (0%;  $n = 0$ ) control groups earned a score of two. Fisher's Exact tests revealed a significant difference between the experimental group and the no-distress control group ( $p = .001$ ), a nearly significant difference between the experimental and no-video control group ( $p = .09$ ), and no differences between the two control groups ( $p = .26$ ).

The target acts scores were not related to the conventional acts scores using the full range of the scales,  $X^2(6) = 4.23, p = .65$ , or using the dichotomized scores, Fisher's exact,  $p = .11$ . Additionally, the magnitude of a Spearman's Rho correlation between these two variables was small and nonsignificant,  $r(29) = .14, p = .44$ . Some children in the experimental group had a score greater than one on both the target act and conventional act measures ( $n=3$ ), but more children had a high score on either the conventional act measure ( $n= 3$ ) or target act measure ( $n=$

2) , suggesting that the conventional behaviors were not simply additional prosocial behaviors accompanying the children's imitation.

Although there was little relation between the scores, considering children's performance on the two measures shows that children in the experimental group were likely to attempt reproduce the overall goal of making the adult feel better. Nine of the 10 children in this group achieved a score greater than 1 on at least one of the measures. In contrast, only two children in the control groups showed this high of a score on either of the measures (two children in the no-video control achieved a 2 on the conventional acts score.) Fisher's exact tests show a significant difference in scores greater than one on either task between the experimental and each control group,  $p$  values  $< .03$ .

### **Discussion**

Researchers have differentiated several social learning mechanisms, including imitation and emulation. To date, most studies of these mechanisms have examined how children learn to manipulate and use novel objects (for review, see Want & Harris, 2002), though researchers have also recognized that these mechanisms can be used to interact socially with others, such as through turn-taking exchanges (Over & Carpenter, 2009; Uzgiris, 1981). The current project extends these investigations by examining which social learning mechanisms underlie children's acquisition of a particular social behavior, alleviating distress in a parent.

The results suggest that, through observation, children learn and appropriately apply behavioral solutions for specific social problems. After observing an adult use a novel prosocial act to help a hurt person, two-year-olds reproduced the novel act to comfort their injured parent (experimental group). Children who did not see the demonstration of the novel prosocial act (the no-video control group) did not produce the complete target act in response to their parent's pain.

This indicates that children in the experimental group imitated the demonstration. Further, children who saw the prosocial demonstration but were not exposed to parent's distress (the no-distress control group) also did not produce the complete target behavior, indicating that children in the experimental group applied the response to a directed, meaningful situation – that of easing another's pain.

Children who saw the video and were exposed to parent's pain were also more likely than children in both control groups to engage in non-demonstrated, conventional prosocial acts when confronted with a hurt adult. That is, regardless of whether they patted the distressed parent with the mitt, children who saw the video were more likely to display behaviors such as hugging, kissing, and verbally comforting their parents than were children who did not see the video (no-video control) or did not see a distressed parent (no-distress control). The adult's example led children to intervene and attempt to alleviate their hurt parents' pain, suggesting emulation.

A child's capacity to acquire new prosocial behaviors has implications for his or her competence in various domains including peer relationships, academic achievement, and psychological functioning (Eisenberg, Fabes, Karbon, & Murphy, et al., 1996; Warden & Mackinnon, 2003; Zahn-Waxler & Van Hulle, 2011). Programs for promoting prosocial behaviors are often implemented in school contexts and typically employ positive reinforcement (Eisenberg, 2006), induction (e.g., Ramaswamy & Bergin, 2009), or perspective-taking training (e.g., Frey, Nolen, Edstrom, Hirschstein, 2005). Our findings suggest that demonstrations may be effective for teaching new prosocial behaviors and for promoting previously acquired ones as toddlers develop their social repertoire.

## References

- Bandura, A. (1965). Influence of models' reinforcement contingencies on the acquisition of imitative responses. *Journal of Personality and Social Psychology, 1*, 589–595.
- Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *The Journal of Abnormal and Social Psychology, 63*, 575–582.
- Bandura, A., Ross, D., & Ross, S. A. (1963). Imitation of film-mediated aggressive models. *The Journal of Abnormal and Social Psychology, 66*, 3-11.
- Barr, R., Dowden, A., & Hayne, H. (1996). Developmental changes in deferred imitation by 6- to 24-month-old infants. *Infant Behavior and Development, 19*(2), 159–170.
- Barr, R. & Hayne, H. (1999). Developmental changes in imitation from television during infancy. *Child Development, 70*, 1067-1081.
- Bauer, P. J., & Mandler, J. M. (1992). Putting the horse before the cart: The use of temporal order in recall of events by one-year-old children. *Developmental Psychology, 28*(3), 441.
- Calvert, S. L. (2006). Media and early development. In K. McCartney & D. Phillips (Eds.), *Blackwell handbook of early childhood development* (pp. 508–529). Malden, MA: Blackwell Publishing Ltd.
- Carpenter, M., Akhtar, N., & Tomasello, M. (1998). Fourteen- to 18-month-old infants differentially imitate intentional and accidental actions. *Infant Behavior and Development, 21*, 315-330.
- Cole, P. M., Barrett, K. C., & Zahn-Waxler, C. (1992). Emotion displays in two-year-olds during mishaps. *Child Development, 63*(2), 314–324.
- Dunfield, K., Kuhlmeier, V. A., O'Connell, L., & Kelley, E. (2011). Examining the diversity of prosocial behavior: Helping, sharing, and comforting in infancy. *Infancy, 16*(3), 227–247.

- Eisenberg, N. (2006). Prosocial Behavior. In G. G. Bear & K. M. Minke (Eds.), *Children's needs III: Development, prevention, and intervention*. (pp. 313-324). Washington, DC US: National Association of School Psychologists.
- Eisenberg, N., & Fabes, R. A. (1998). Prosocial development. In N. Eisenberg (Ed.), *Handbook of child psychology, 5th ed.: Vol 3. Social, emotional, and personality development*. (pp. 701-778): Hoboken, NJ, US: John Wiley & Sons Inc.
- Eisenberg, N., Fabes, R. A., Karbon, M., Murphy, B. C., Wosinski, L. P., Carlo, G., et al. (1996). The relations of children's dispositional prosocial behavior to emotionality, regulation, and social functioning. *Child Development, 67*(3), 974-992.
- Frey, K. S., Nolen, S. B., Van Schoiack Edstrom, L., & Hirschstein, M. K. (2005). Effects of a school-based social-emotional competence program: Linking children's goals, attributions, and behavior. *Journal of Applied Developmental Psychology, 26*(2), 171-200.
- Friedrich, L. K., & Stein, A. H. (1975). Prosocial Television and Young Children: The Effects of Verbal Labeling and Role Playing on Learning and Behavior. *Child Development, 46*, 27-38.
- Gray, R., & Pirot, M. (1984). The effects of prosocial modeling on young children's nurturing of a 'sick' child. *Psychology & Human Development, 1*(1), 41-46.
- Hastings, P. D., Rubin, K. H., & DeRose, L. (2005). Links among gender, inhibition, and parental socialization in the development of prosocial behavior. *Merrill Palmer Quarterly, 51*(4), 467.

- Hay, D. F., & Cook, K. V. (2007). The transformation of prosocial behavior from infancy to childhood. In C. A. Brownell & C. B. Kopp (Eds.), *Socioemotional development in the toddler years: Transitions and transformations*, 100–131. New York, NY: Guilford Press.
- Mares, M.-L., & Woodard, E. (2005). Positive effects of television on children's social interactions: A meta-analysis. *Media Psychology*, 7, 301–322.
- Meltzoff, A. N. (1988a). Imitation of televised models by infants. *Child Development*, 59, 1221–1229.
- Meltzoff, A. N. (1988b). Infant imitation after a 1-week delay: Long-term memory for novel acts and multiple stimuli. *Developmental Psychology*, 24(4), 470–476.
- Meltzoff, A. N., & Moore, M. K. (1977). Imitation of facial and manual gestures by human neonates. *Science*, 198(4312), 75–78.
- Nielsen, M. (2006). Copying actions and copying outcomes: Social learning through the second year. *Developmental Psychology*, 42(3), 555–565.
- Over, H., & Carpenter, M. (2009). Priming third-party ostracism increases affiliative imitation in children. *Developmental Science*, 12(3), F1–F8.
- Ramaswamy, V., & Bergin, C. (2009). Do reinforcement and induction increase prosocial behavior? Results of a teacher-based intervention in preschools. *Journal of Research in Childhood Education*, 23(4), 527–538.
- Rushton P. J., & Owen, D. (1975). Immediate and delayed effects of TV modelling and preaching on children's generosity. *British Journal of Social & Clinical Psychology*, 14, 309–310.
- Staub, E. (1971). A child in distress: The influence of nurturance and modeling on children's attempts to help. *Developmental Psychology*, 5, 124–132.

- Svetlova, M., Nichols, S. R., & Brownell, C. A. (2010). Toddlers' prosocial behavior: From instrumental to empathic to altruistic helping. *Child Development, 81*(6), 1814–1827.
- Uzgiris, I. C. (1981). Two functions of imitation during infancy. *International Journal of Behavioral Development, 4*(1), 1–12.
- Want, S C, & Harris, P. L. (2001). Learning from other people's mistakes: causal understanding in learning to use a tool. *Child Development, 72*(2), 431–443.
- Want, Stephen C., & Harris, P. L. (2002). How do children ape? Applying concepts from the study of non-human primates to the developmental study of imitation in children. *Developmental Science, 5*(1), 1–13.
- Warden, D., & Mackinnon, S. (2003). Prosocial children, bullies and victims: An investigation of their sociometric status, empathy and social problem-solving strategies. *British Journal of Developmental Psychology, 21*(3), 367–385.
- Warneken, F., & Tomasello, M. (2007). Helping and cooperation at 14 months of age. *Infancy, 11*(3), 271–294.
- Zahn-Waxler, C., Cole, P. M., Welsh, J. D., & Fox, N. A. (1995). Psychophysiological correlates of empathy and prosocial behaviors in preschool children with behavior problems. *Development and Psychopathology, 7*, 27–27.
- Zahn-Waxler, C., Radke-Yarrow, M., & King, R. A. (1979). Child rearing and children's prosocial initiations toward victims of distress. *Child Development, 50*, 319–330.
- Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology, 28*, 126.

Zahn-Waxler C., & Van Hulle C. (2011). Empathy, guilt, and depression: When caring for others becomes costly to children. In: B. Oakley, A. Knafo, G. Madhavan and D. S. Wilson, (Eds.) *Pathological altruism* (321-344). New York, NY: Oxford University Press.

Footnote

- <sup>1</sup> The outcome measure could not be scored for one child in the no-video control due to a bad camera angle.

Figure 1. Photo of mitt stimuli (A), and still image from the video of prosocial target act (B).

