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Selectivity in Toddlers' Behavioral and Emotional Reactions to Prosocial and Antisocial Others

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Whereas some evidence suggests that toddlers consider targets' deservingness when deciding whom to help, other research demonstrates that toddlers help indiscriminately. The present findings shed light on this discrepancy by demonstrating that although toddlers do exhibit selectivity in giving behaviors, their emotional responses are comparatively indiscriminate. Specifically, in Experiment 1, 20-month-olds ($N = 64$) were more likely to give preferred toys to prosocial versus antisocial puppets, and more likely to withhold toys from antisocial versus prosocial puppets. Experiment 2 ($N = 64$) ruled out low-level explanations for the effects observed in Experiment 1, demonstrating that toddlers do not show the same effects when puppets' toy preferences are unclear. Despite providing evidence for selectivity in giving behaviors, across both experiments, toddlers were happier after giving than before giving, regardless of what they gave or whom they gave to. These results reveal the possibility of a divergence in early prosociality: Toddlers' giving behaviors are responsive to recipient deservingness, but their after-the-fact emotional reactions are responsive to giving acts themselves. Results are discussed in terms of their relevance to the debate regarding whether toddlers' early prosocial behaviors are discriminate versus indiscriminate.

Keywords: infancy, prosocial behaviors, selectivity

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Human beings are exquisitely nice. They hold doors open, give blood, and donate money to charity. Humans act prosocially even if they will never meet the beneficiaries of their helpful acts and even though prosocial behaviors may be personally costly. The performance of prosocial behaviors is evident early in development: Infants help, share, and comfort others within the first 2 years of life (for review, see Eisenberg, Spinrad, & Morris, 2014; Svetlova, Nichols, & Brownell, 2010; Vaish & Tomasello, 2014; Warneken, 2016). By the middle of the second year, these prosocial behaviors occur even when overt communicative cues, parental expectations, or concrete rewards are absent (e.g., Hepach, Haberl, Lambert, & Tomasello, 2017; Hepach, Vaish, & Tomasello, 2012; Vaish, Carpenter, & Tomasello, 2009; Warneken, 2013; Warneken & Tomasello, 2008, 2013a; but see Brownell, Svetlova, Anderson, Nichols, & Drummond, 2013; Barragan & Dweck, 2014; Dahl, 2015; Hammond & Carpendale, 2015), suggestive that by this point, toddlers' prosocial behaviors are intrinsically rather than extrinsically motivated.

Selective Prosociality Maintains Cooperative Systems

There are clear benefits to engaging in prosocial behaviors and living in cooperative systems: Helping and sharing with others allows groups of cooperators to achieve successes that individuals could not achieve alone. Despite these benefits, a tendency to help anyone and everyone would be problematic, as indiscriminate prosocial behavior leaves cooperative systems vulnerable to cheaters who benefit from others' costly prosocial behaviors without cooperating in return (e.g., Axelrod, 1984). Selective prosociality—only being prosocial in certain situations and/or toward certain individuals—is one way to protect against this vulnerability. At least two models of selective prosociality have been proposed. First, the "partner-fidelity" model considers situations in which

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two individuals interact repeatedly over time, and proposes that cooperative systems are maintained through reciprocity: Individuals respond prosocially to their partners' prosocial acts but antisocially to their partners' antisocial acts (e.g., Axelrod & Hamilton, 1981; Bull & Rice, 1991). Over time, these reciprocal behaviors motivate interaction partners to produce more prosocial and fewer antisocial acts, and cooperation flourishes. The second, "partner-choice" model considers situations in which individuals need not interact with the same individual over time but can choose which individuals they will and will not interact with. In this model, cooperative systems are maintained by selectively interacting with previously prosocial others while avoiding antisocial ones (e.g., Baumard, André, & Sperber, 2013; Bull & Rice, 1991; Roberts, 1998).

Critically, both the partner-fidelity and partner-choice models explain how reciprocity and selectivity could support the evolution and maintenance of cooperative systems, and both are likely at play in different instances of selective prosociality in adults. But what about early in development? Given the early emergence of prosociality in human development and the critical nature of selectivity in models of the evolution of cooperation, it is worth investigating whether early prosocial acts are selective or not, and if so, whether early selectivity resembles partner-fidelity models, partner-choice models, or both.

Are Infants Selectively Prosocial?

Currently, whether early prosocial behaviors are selective is a matter of some controversy (for discussion, see Kuhlmeier, Dunfield, & O'Neill, 2014; Warneken & Tomasello, 2009; Wynn, 2009). Some researchers contend that young children are not selectively prosocial, instead helping whenever and whomever they can without consideration of whether the beneficiary deserves to be helped. These researchers describe young children as "indiscriminate altruists" (Warneken & Tomasello, 2009). Supporters of this view explain that because caretakers ensure that young children are surrounded by friends, family, and others who mean them well, they do not *need* to be selectively prosocial: Everyone will treat the children positively. In this safe space, children can reap the benefits of engaging in mutually prosocial relationships without worrying about the cooperative status of their interaction partners. Selective prosociality, then, emerges once children's social world expands and they begin to make their own interactional choices, presumably sometime during the preschool or early school years.

Evidence for Indiscriminate Altruism

Supporting the indiscriminate altruist account, several studies demonstrate that younger children fail tasks that examine selective prosociality, whereas older children succeed. For example, one study demonstrated that whereas 3-year-olds were more likely to share toys with a puppet who previously shared with them, 2-year-olds shared randomly (Warneken & Tomasello, 2013b). Similarly, 4-year-olds, but not 3-year-olds, shared more biscuits with a puppet who previously helped a third party over a puppet who previously harmed a third party (Kenward & Dahl, 2011; see also Malti et al., 2016). Finally, a study exploring whether children's helping is selective found that 27-month-olds, but not toddlers at 17 and 22 months, helped an adult who previously helped a third party before they helped an adult who previously harmed a third party (Dahl, Schuck, & Campos, 2013). Together, despite some variability in what age young children are successfully selective, these results suggest that older children's prosocial behaviors are sensitive to recipients' deservingness, whereas younger children's are not.

Evidence for Discrimination

In contrast to the indiscriminate altruist view, others contend that even early prosociality is selective (Kuhlmeier et al., 2014; Wynn, 2009). Supporters of this view argue that if early prosocial behaviors are based on the same cognitive and motivational structures as are later ones, selectivity might be observable early in ontogeny even if young children do not *need* to be selective. Indeed, despite the previously mentioned studies failing to show selectivity, a growing body of evidence suggests that even infants attend to the differences between prosocial and antisocial others. For example, in the first 6 to 9 months of life, infants react more negatively when interacting with a human who fails to give them a toy on purpose (antisocial teasing) than who does so unintentionally (failed prosocial giving; e.g., Behne, Carpenter, Call, & Tomasello, 2005; Marsh, Stavropoulos, Nienhuis, & Legerstee, 2010). As early as 3 months of age, infants selectively attend to and reach for puppets who previously helped versus harmed third parties (Hamlin & Wynn, 2011; Hamlin, Wynn, & Bloom, 2010; see review in Van de Vondervoort & Hamlin, 2016; see also Geraci & Surian, 2011; Scola, Holvoet, Arciszewski, & Picard, 2015; but see Salvadori et al., 2015), and by 12 months, infants' social evaluations are sufficiently strong that they will incur material costs to avoid interacting with antisocial others (Tasimi & Wynn, 2016).

Although infants' differential social reactions to and preferences for prosocial versus antisocial others are not necessarily evidence for selective *prosociality*, other studies suggest that first- and third-party prosocial and antisocial behaviors can influence toddlers' own prosocial and antisocial acts. For example, 21-month-old toddlers selectively give a desired object to an individual who was previously unable, versus unwilling, to give them a toy (Dunfield & Kuhlmeier, 2010), and 19- to 24-month-olds selectively give "treats" to a puppet who previously helped a third party but selectively take treats away from a puppet who previously harmed a third party (Hamlin, Wynn, Bloom, & Mahajan, 2011; see also Burns & Sommerville, 2014; Dunfield, Kuhlmeier, & Murphy, 2013). Critically, in Hamlin et al. (2011), toddlers' selective behaviors did not reflect low-level valence matching: More toddlers gave to a victim of an antisocial act, and more toddlers took from a beneficiary of help. Together, these results suggest that toddlers can selectively direct prosocial and antisocial behaviors toward deserving recipients.

Why do young children appear selective in some situations and indiscriminate in others? One possibility is that it is relatively easier for toddlers to demonstrate selective prosocial behaviors when presented with "forced-choice" paradigms consistent with a partner-choice model of selectivity. That is, to date, all studies showing selectivity in toddlers under 24 months of age have used procedures in which toddlers must choose which of two targets to be prosocial (or antisocial) toward (e.g., Dunfield & Kuhlmeier, 2010; Hamlin et al., 2011; note that young children have not

uniformly demonstrated selectivity in forced-choice paradigms: Dahl et al., 2013; Kenward & Dahl, 2011). These forced-choice measures may not reflect children's typical social interactions outside the laboratory, where children are rarely allocated a fixed resource that they *must* dole out to someone; instead, children typically decide how to treat a single individual during one-on-one interactions. Therefore, forced-choice paradigms may have overestimated young children's ability to be selectively prosocial (see Warneken & Tomasello, 2013b, for evidence that 2-year-olds share indiscriminately with a single interaction partner). Thus, if toddlers exhibit prosocial selectivity when interacting with a single individual, this would provide strong evidence that early prosocial behavior is indeed selective. The present study aims to fill this gap, by examining toddlers' selective prosociality in interactions with single individuals who are differentially deserving of prosocial treatment.

The Current Studies

In Experiment 1, we explored whether 20-month-olds modulate their giving behaviors toward an individual who makes an ambiguous request for "one" of two different kinds of toys. We examined whether toddlers' giving responses depended on their knowledge of (a) the recipient's prior prosocial or antisocial actions toward a third party, and (b) the recipient's toy preference. Because we reasoned that strong social demands on toddlers' responses would reduce variability in responding, puppets did not explicitly state their toy preference but instead only implied it. Specifically, preference was implied by the puppet's selection of several of a rare kind of toy from a box containing mostly a different kind of toy. This repeated selection of the rare toy was a clear violation of random sampling of the toys in the box, as random choosing (as well as a preference for the common toy) would lead the puppet to most often select the common toy. Previous research has demonstrated that toddlers at this age interpret this same violation of random sampling as indicative that the sampler prefers the rare item over the common item (e.g., Kushnir, Xu, & Wellman, 2010; see also Hu, Lucas, Griffiths, & Xu, 2015; Ma & Xu, 2011; Wellman, Kushnir, Xu, & Brink, 2016; Xu & Denison, 2009).

In response to the ambiguous request for "one" toy, toddlers could respond in three ways. First, they could give the selected toy, a clearly prosocial response given the inference that the selected toy is preferred. Second, they could provide the unselected toy; we considered this response ambiguous, given that toddlers provided a toy, but one they had reason to believe the puppet disliked. Third, toddlers could give nothing, a clearly antisocial response given the direct request. Because past research demonstrated that toddlers selectively direct prosocial behaviors toward prosocial others in a forced-choice paradigm (e.g., Dunfield & Kuhlmeier, 2010; Hamlin et al., 2011), we predicted that toddlers would also treat prosocial puppets prosocially, providing the selected toy rather than the unselected toy. In contrast, we predicted that toddlers would behave less prosocially toward antisocial puppets, and more often provide the unselected toy or even nothing at all. Although the possibility that toddlers would refuse to give to an antisocial puppet was intriguing, and therefore we chose to include failures to give as an interpretable response, we did not initially anticipate that toddlers would frequently refuse to comply with a direct request given the strong social demands of the situation.

Although our primary goal was to explore behavioral selectivity, we also wished to explore the motivations underlying toddlers' prosocial acts. Past research regarding children's prosocial motivations has examined toddlers' sympathetic arousal when observing others in need (Hepach et al., 2012), and has shown that arousal is reduced both when the child and when someone else provides help, suggestive that toddlers' performance of prosocial behaviors is motivated by genuine concern for others' needs (see also Hepach, Vaish, & Tomasello, 2013). Furthermore, studies measuring toddlers' affect after engaging in acts of giving have shown that, like adults (e.g., Aknin et al., 2013; Aknin, Fleerackers, & Hamlin, 2014; Borgonovi, 2008; Dunn, Aknin, & Norton, 2008; Helliwell, Layard, & Sachs, 2013), toddlers in North America and elsewhere exhibit greater happiness after giving to others than after receiving resources themselves, particularly when giving behaviors are costly (Aknin, Broesch, Hamlin, & Van de Vondervoort, 2015; Aknin, Hamlin, & Dunn, 2012). However, because previous research examining toddlers' happiness after giving has utilized neutral recipients whom toddlers presumably believe deserve to be helped, it is unknown whether affective experiences differ if a needy individual is *undeserving* of prosocial treatment because she previously acted antisocially. Thus, in the current studies, we explored whether toddlers' affective reactions to their own giving behaviors depend on the deservingness of the recipient.

To examine toddlers' emotional reactions after giving to or withholding from prosocial or antisocial others, three coders rated toddlers' emotional expressions on a 1-to-7 Likert scale (1 = *not at all happy*; 4 = *neutral*; 7 = *very happy*; as in Aknin et al., 2012, 2015). Despite our clear predictions for toddlers' giving selectivity, we were less confident in our predictions of toddlers' emotional selectivity. Specifically, toddlers might be emotionally selective, and thus happier, after giving to a prosocial versus antisocial puppet, and happiest after giving the prosocial puppet the selected toy. Conversely, toddlers' emotional responses might be tied to the act of giving itself rather than to the recipient, making engagement in *any* prosocial activity emotionally rewarding. If so, toddlers might be emotionally indiscriminate, and thus equally happy after giving the selected or unselected toy to either a prosocial or antisocial puppet.

Experiment 1

Experiment 1 explored whether toddlers display behavioral selectivity, emotional selectivity, or both when interacting with a single prosocial or antisocial individual in a non-forced-choice method.

Method

Participants. Participants in both experiments were recruited from a midsize North American city through hospitals and web sign-ups. Most toddlers came from middle-class families representative of the racial and ethnic demographics of the city. Sixty-four full-term, healthy toddlers who heard 80% to 100% English (25 males, M_{age} = 19.95, range = 19.43–20.60) participated in Experiment 1. Twenty additional toddlers were excluded for procedural/technical errors (n = 12), fussiness (n = 6), and failure to complete the warm-up task (n = 2; both assigned to the antisocial

condition).[1] Before data collection began, we intended to test 16 toddlers per condition, which was consistent with other studies exploring toddlers' willingness to give to helpful versus unhelpful puppets (see Hamlin et al., 2011). The number of toddlers that withheld during this initial data collection necessitated that the sample size be increased if we were to detect a difference between giving the selected and unselected object to the prosocial or antisocial puppet.[2] We then established a final stopping rule of 32 toddlers per condition. This larger sample size was selected to exceed that used to demonstrate 20-month-olds' use of statistical sampling to infer others' preferences (24 toddlers per condition; Kushnir et al., 2010); notably, previous research suggests that doubling one's sample size a single time does little to increase Type I error rates (Sagarin, Ambler, & Lee, 2014).

Procedure. The procedure was divided into four phases. Toddlers sat on their caregivers' laps. Each phase occurred in the same room; caregivers and toddlers moved from one side of a table to another during different phases. Caregivers were instructed not to interact with their toddlers unless requested, and closed their eyes during the puppet show.

Warm-up. Toddlers were first acclimated to the testing room, Experimenter 1, and our giving procedure via a warm-up. Toddlers sat on the side of the testing table perpendicular to the occluded puppet show stage (see Figure 1; toddler in position P1 and E1 in P2). Toddlers were introduced to a puppet called "Mr. Lion," who wanted to play a "giving game." Mr. Lion briefly played with a toy car and then passed it to the toddler, saying, "Vroom! I give the car to you!" and waited for a few seconds as the toddler played with the toy. Mr. Lion then said, "Can you give it to me?" and waited with arms outstretched. If toddlers did not immediately release the toy, Mr. Lion said "Please please please! Can you give it to me?" and grasped the car. If the toddler then released the car, Mr. Lion said "Thank you, thank you!" and repeated the giving procedure once more. If not, Mr. Lion or parents (if requested) removed the toy from the child's grasp. Once toddlers willingly released this car twice, Mr. Lion got out a new car and played the game again. Once toddlers willingly released the second car twice, the giving game was complete. Thus, the warm-up included a minimum of four giving rounds (two rounds per car toy), but this number increased if a toddler was unwilling to give, and so the puppet or parent needed to remove the toy from the toddler's grasp in order to continue the interaction. It was predetermined that toddlers who did not willingly release at least one toy to Mr. Lion would be removed from the final sample, as it would be impossible to interpret any subsequent failures to give at the end of the study; two toddlers were removed for this reason.

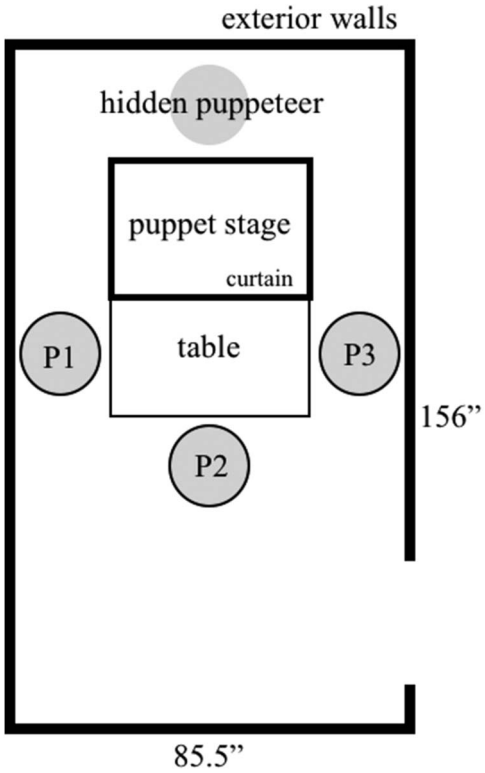

Figure 1. Overview of testing room. Table and puppet stage measure 48 × 61 in.

Puppet show. Toddlers moved to the end of the testing table, facing the puppet show stage (P2). A puppet show containing prosocial and antisocial events was then enacted by E1 (see Figure 2 and Supplemental Videos 1 and 2 of the online supplemental materials). To start each event, the curtain rose to reveal a 28.5 ×

[1] An additional 55 toddlers participated in Experiments 1 and 2 after a period of lab construction that included significant cosmetic changes to the testing room, including bright sky-blue walls, bright yellow doors, and curtains that were dark blue on the sides but light blue on the back. These decisions were made for various reasons, but mostly to make the lab environment more fun and kid-friendly. However, the decisions also appeared to make the lab less science-friendly. Over the course of several months in this new lab space, we noticed that infants seemed more distracted than before the construction, and that studies that had been showing significant effects before the construction (in two different lab spaces in the department) were now showing null effects across the board (typically in the form of persistent color preferences, especially if one of the puppets was wearing blue). The stark differences in infants' performance before and after construction led to the decision to exclude *all* data collected in *all* puppet show studies in the lab since construction. We then repainted the lab's walls and doors off-white and went back to black curtains, in an attempt to reduce the distractibility of the environment. Fifteen toddlers participated in Experiment 1 (11 males, M_{age} = 20.05 months, range = 19.57–20.57). Two additional toddlers would have been excluded for fussiness (n = 1) and failure to complete the warm-up task (n = 1). Twelve participated in the antisocial condition (six gave the selected toy, three gave the unselected toy, and three gave nothing) and three participated in the prosocial condition (one gave the selected toy, one gave the unselected toy, and one gave nothing). Twenty toddlers participated in Experiment 2 (12 males, M_{age} = 19.71 months, range = 19.2–20.63). Eighteen additional toddlers would have been excluded for fussiness (n = 8), failure to complete the warm-up task (n = 1), parental interference (n = 2), and procedural/technical errors (n = 7). Eleven participated in the antisocial condition (two gave the selected toy, four gave the unselected toy, and five gave nothing) and nine participated in the prosocial condition (two gave the selected toy, two gave the unselected toy, and five gave nothing).

[2] Giving behaviors were similar before and after the sample size was doubled in Experiment 1. During the first half of data collection, 10 toddlers gave the selected toy, five gave the unselected toy, and one gave nothing to the prosocial puppet, while seven gave the selected toy, five gave the unselected toy, and four gave nothing to the antisocial puppet. During the second half of data collection, 13 toddlers gave the selected toy, two gave the unselected toy, and one gave nothing to the prosocial puppet, while six gave the selected toy, four gave the unselected toy, and six gave nothing to the antisocial puppet.

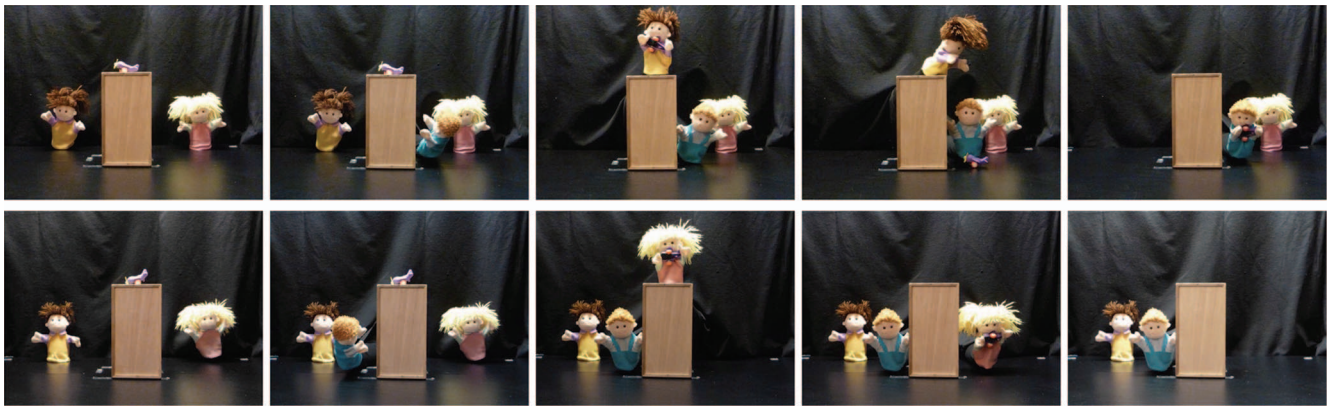

Figure 2. Sample images of puppet show. Top row depicts a prosocial event, in which the girl puppet makes the airplane toy accessible to the boy puppet. Bottom row depicts an antisocial event, in which the girl puppet runs offstage holding the airplane toy. See the online article for the color version of this figure.

15.5 × 15.1-cm wooden shelf with an airplane toy on top. Two "girl" puppets, both Caucasian and 22 cm tall—one with blonde hair and a pink shirt, and one with brown hair and a yellow shirt—rested at each rear corner of the stage. A "boy" puppet (18.5 cm) entered from the rear center stage, moved to the side of the shelf, and looked toward the toy on top of the shelf. He made two quick jumps up the side of the shelf three different times, trying to get the toy (jumping slightly higher each time for a total of six jumps), but was ultimately unsuccessful. After the boy's final failed attempt, he put his head down on stage, implying he had given up, and then sat backup and paused. The girl resting in the opposite corner of the stage then ran forward and jumped sideways onto the top of the box. During prosocial acts, the girl picked up the toy, leaned over the side of the shelf toward the boy, and dropped it down to him; the boy either caught the toy in the air or jumped onto it when it fell (some puppeteers found it difficult to reliably catch the toy). The prosocial girl then jumped back off the shelf and ran offstage. During antisocial acts, the girl picked up the toy, but then jumped back off the shelf and ran offstage with the toy. After the prosocial or antisocial girl left the stage, the boy jumped up and down quickly twice, either holding the toy (during prosocial acts) or not (during antisocial acts), and all action paused. The stimuli remained visible until toddlers looked away for two consecutive seconds or after 30 total seconds elapsed, as coded online via the program jHab (Casstevens, 2007). Prosocial and antisocial acts alternated for six total events. The following were counterbalanced across toddlers within each condition: hair color of the prosocial puppet (brown, blonde), order of the prosocial act (first, second), and side of the stage of the prosocial puppet (left, right).

Preference display. The preference display, request, and giving phases were modeled after Kushnir et al. (2010). After the puppet show, toddlers returned to the side of the table perpendicular to the puppet show stage (P1). Toddlers were then shown a box with a clear lid containing both yellow rubber frogs and green rubber ducks; there were over 4 times more of one toy than the other (7 vs. 31). E1 (again seated in P2) said "Look!" Ducks and frogs!" and allowed toddlers to play with the toys for approximately 30 s. During this time, E1 highlighted the presence of each kind of toy in various ways (e.g., "Ducks say quack! Frogs say ribbit!" or "A duck! A frog!"), being careful to mention both kinds equally. After about 30 s, E1 asked the toddler to help her place the toys back in the box. The box was then moved out of the toddlers' reach, and E1 said "I think I hear someone coming!" E2 then appeared from behind the curtain at position P3, holding one of the girl puppets from the show (prosocial or antisocial; E2 was blind to the puppet's identity). The puppet (manipulated by E2) proceeded to remove five of the rare toy from the box, saying, on alternate removals, "Ooh! A duck!" and "Quack quack" (if selecting ducks) or "Ooh! A frog!" and "Ribbit ribbit" (if selecting frogs). The puppet placed each toy down in front of the box, facing the child. After removing five toys, the puppet and E2 disappeared back behind the stage, and E1 moved the toys and box back within the toddlers' reach and EI and the toddler placed the toys back in the box. E1 then shut the box and placed it under the table. E1 then retrieved a tray from under the table (55.1 cm long × 11.5 cm wide; made of foam core) with a small plastic bowl attached to each end; one bowl containing four frogs and the other containing four ducks. E1 said "Look! More ducks and frogs!" and placed the tray halfway across the table, beyond toddlers' reach. E1 then sat back, said "I think I hear someone coming again!" and looked down so as not to influence the child.

Request and giving phase. E2 returned to her position at P3 with the puppet who had previously taken toys out of the box, placed the puppet in the middle of the two bowls and animated the puppet to say, "Ooh, goody! Just what I wanted! Can you give me one?" The puppet then pushed the center of the strip of foam core forward, so that the bowls moved within toddlers' reach, and then paused with her arms outstretched just behind the center of the strip. If toddlers did not immediately give her a toy, she asked, "Can you give me one?" up to two more times at approximately 10-s intervals. This was approximate because E2 avoided making requests while toddlers were actively reaching toward one bowl or the other, or while the toddler had a hand in a bowl. To avoid having the puppet's response (i.e., saying "thank you") influence toddlers' subsequent giving behaviors, the procedure ended after the toddler gave the puppet one toy. If the toddler did not give a toy within 10 s of the puppet's third request, the procedure ended and

the toddler was recorded as failing to give. Toddlers were randomly assigned to prosocial and antisocial conditions; the selected toy (ducks, frogs) and side of selected toys during the request and giving phase (left, right) were counterbalanced within conditions.

Coding. The behavioral variable of interest was whether toddlers gave the selected toy, the unselected toy, or nothing following the puppet's request. The emotional variable of interest was whether toddlers' happiness increased following their decision to give or withhold from the puppet. To measure toddlers' emotional reactions, three independent coders watched videos of the request and giving phase; thus, coders were blind to the puppets' previous behavior and toy preference. Videos showed the toddler seated on their parents' lap, and toddlers' face and upper body were visible. Coders rated toddlers' happiness on a 1-to-7 scale (1 = *not at all happy*; 4 = *neutral*; 7 = *very happy*; as in Aknin et al., 2012, 2015; average $\alpha = .804$). For toddlers who gave, happiness was rated during three phases: during the puppet's request, after the request but pregiving, and postgiving. For toddlers who did not give, happiness was rated during two phases: during the puppet's request and while withholding from the puppet. Given the difficulty in determining exactly when each child "withheld" from the puppet, and because 70% of givers in the prosocial condition and 73% in the antisocial condition gave between the first and second request, we decided to equate the time periods across behavioral responses (i.e., "while withholding" ratings reflect coders' sense of toddlers' happiness after the first request but before the second).

The following additional variables were coded by individuals blind to condition and what (if anything) toddlers gave during the giving phase: the length of time (in seconds) toddlers attended to the paused scene following prosocial and antisocial events, and the proportion of the preference display to which toddlers attended. Finally, following the procedure, Experimenter 1 noted the point at which toddlers (who gave anything) gave a toy (on a 1-to-6 scale, with 1 = *immediately after the first request*, 2 = *not immediately but before the second request*, 3 = *immediately after the second request*, etc.). Timing was coded ordinally rather than continuously because of the difference in time between requests for those toddlers who were touching or holding toys when a request should have occurred and those who were not. Toddlers who gave nothing received no time score.[3]

Finally, to ensure that any differences between conditions in toddlers' failure to give during the giving phase were not the result of failures of random sampling (i.e., that there happened to be more toddlers who were at baseline more reluctant to give in the antisocial vs. the prosocial condition), we coded various measures of toddlers' "willingness to give" during the warm-up. These included the length of time (in seconds) between the lion puppet's first request for a toy and the toddler's first willing give, as well as the proportion of giving rounds in the warm-up in which the toddler willingly gave the toy to the lion puppet.

Results

Attention. Although our key dependent variables of interest were giving behavior and emotional reactions, we also explored how long children looked at the stage following the prosocial or antisocial events, as this could indicate differential processing of these key events. Toddlers looked longer following prosocial events ($M = 10.915$, $SD = 6.366$) than antisocial events ($M = 8.525$, $SD = 5.119$; paired samples t test, $t[63] = 4.210$, $p < .001$, $d = .526$). Although this result is broadly inconsistent with demonstrations that 15- to 21-month-olds look longer following unequal versus equal resource distributions (e.g., Geraci & Surian, 2011; Schmidt & Sommerville, 2011; Sloane, Baillargeon, & Premack, 2012), this observation mirrors Experiment 4 of Hamlin et al. (2011), in which toddlers looked longer following prosocial events in two other prosocial/antisocial puppet shows. Critically, however, although there was a significant difference in looking times following prosocial and antisocial events, we have no reason to suspect that this reflects meaningful differences in processing or memory of the prosocial or antisocial actions performed in the puppet show. In fact, toddlers' giving behaviors suggest that they remembered the antisocial puppet's behavior because they treated her differently than the prosocial puppet. Importantly, toddlers' watched prosocial and antisocial puppets' preference displays for an equal proportion of the total display time (prosocial: $M = .951$, $SD = .045$; antisocial: $M = .939$, $SD = .143$; independent samples t test, $t[62] = .420$, $p = .676$, $d = .107$), suggesting that toddlers were equally aware of puppets' toy preferences across conditions.

Giving.

Preliminary analyses. Preliminary tests examined the role of participant characteristics, attention, and counterbalanced variables on giving behaviors. A series of Pearson chi-square tests revealed no effect of the following binary variables on toddlers' tendency to (a) give a toy versus give nothing, or (b) give the selected versus unselected toy across conditions: child's gender, order of antisocial event, antisocial puppet hair color, antisocial puppet side, selected object, side of selected object during giving (Pearson chi-square, all χ^2s $<$ 1.445, all ps $> .228$). A series of one-way ANOVAs revealed no effect of the following continuous variables on tendency to (a) give versus withhold, or (b) give selected versus unselected toy: toddlers' age, attention to the preference display, attention following prosocial events or attention following antisocial events across conditions (one-way ANOVA, all Fs < 2.656, all ps $> .108$). Given the lack of significant results and because no differences were predicted, none of these variables are considered further.

Confirmatory analyses. Toddlers' giving behaviors (gave selected, gave unselected, gave nothing) differed depending on the puppet's previous behavior (prosocial, antisocial; Pearson chi-square, $\chi^2[2] = 8.361$, $p = .015$, $V = .361$; see Figure 3). Specifically, of the 32 toddlers asked for a toy by the prosocial puppet, 23 gave the selected toy, seven gave the unselected toy, and two gave nothing in the elapsed time. In contrast, of the 32 toddlers asked for a toy by the antisocial puppet, 13 gave the selected toy, nine gave the unselected toy, and 10 gave nothing. Post hoc tests using the Bonferroni corrected alpha value of .017 (.05/3) compared rates of each response (gave selected, gave unselected, gave nothing) across the prosocial and antisocial condition revealed that significantly more toddlers gave the selected toy to the prosocial than the antisocial puppet (adjusted standardized residual, $z = 2.520$, $p = .012$) and significantly more toddlers withheld toys from the antisocial than the prosocial puppet ($z = 2.562$, $p = .010$). Rate of

[3] Happiness could not be coded for two toddlers because of technical errors: one toddler in the prosocial condition (gave selected), and one in the antisocial condition (gave selected).

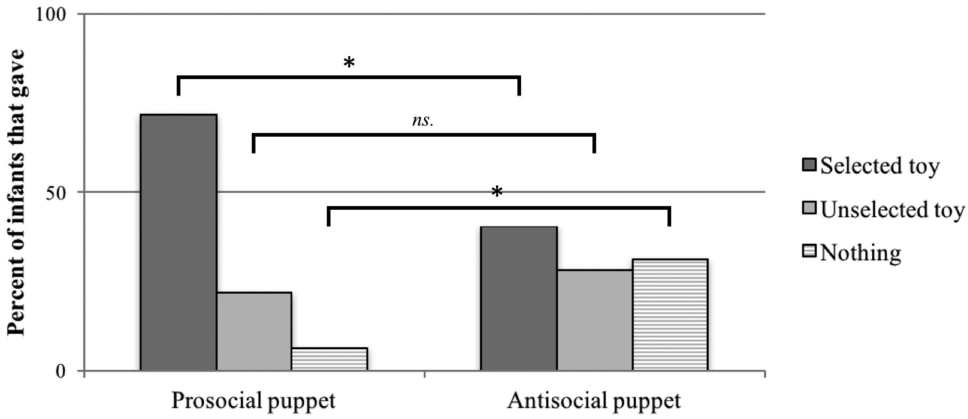

Figure 3. Percent of toddlers who gave the prosocial or antisocial puppet the selected toy, unselected toy, or nothing in Experiment 1 when toy preference could be inferred. * $p < .050$.

giving the unselected toy did not differ by condition ($z = .577$, $p = .564$).

Toddlers were equally fast to give either the selected ($M = 2.139$, $SD = 1.046$) or unselected ($M = 2.438$, $SD = 1.504$) toy, on average giving between the first and second requests (independent samples t tests, $t[50] = .827$, $p = .412$, $d = .253$). Suggestive that toddlers were not simply reluctant to interact with an antisocial puppet, toddlers who gave were equally fast to give to the prosocial puppet ($M = 2.300$, $SD = 1.149$) versus the antisocial puppet ($M = 2.136$, $SD = 1.283$; independent samples t tests, $t[50] = .483$, $p = .631$, $d = .138$). Finally, toddlers who gave and toddlers who withheld in the giving phase were equally willing to give toys to the lion puppet in the warm-up; there was no difference in the length of time before givers' ($M = 24.367$, $SD = 40.428$) and withholders' ($M = 24.909$, $SD = 33.143$) first willing give (independent samples t tests, $t[58] = .041$, $p = .967$, $d = .014$), or between the proportion of giving rounds in which givers ($M = .885$, $SD = .202$) and withholders ($M = .882$, $SD = .271$) willingly released the toy to the puppet (independent samples t tests, $t[58] = .046$, $p = .964$, $d = .015$). These results suggest that the different rates of withholding in the giving phase across conditions cannot be attributed to differences in toddlers' general willingness to give.

Emotional reactions. As our goal was to examine the emotional benefits of giving, we first focused only on those toddlers who provided a toy in response to the puppet's request. For these toddlers, there was no initial difference in happiness when faced with a prosocial ($M = 4.063$, $SD = .196$) versus antisocial ($M = 4.159$, $SD = .374$) puppet's request for a toy (independent samples t tests, $t[48] = 1.172$, $p = .247$, $d = .343$). However, there was a significant change in happiness across the three phases (during the puppet's request, after the request but pregiving, and postgiving; mixed ANOVA with happiness in each phase as the within-subjects variables and condition [prosocial, antisocial] and toy given [selected, unselected] as between-subjects factors, $F[1.740, 80.028] = 16.461$, $p < .001$, $\eta_p^2 = .264$; see Figure 4). This difference in happiness was not influenced by whether the puppet was prosocial or antisocial, whether the toy to be given was the selected or unselected toy, nor the combination of these variables (mixed ANOVA, all Fs < 2.819, ps $> .099$).

To determine when happiness changed across the three phases, we examined the difference in happiness between (a)

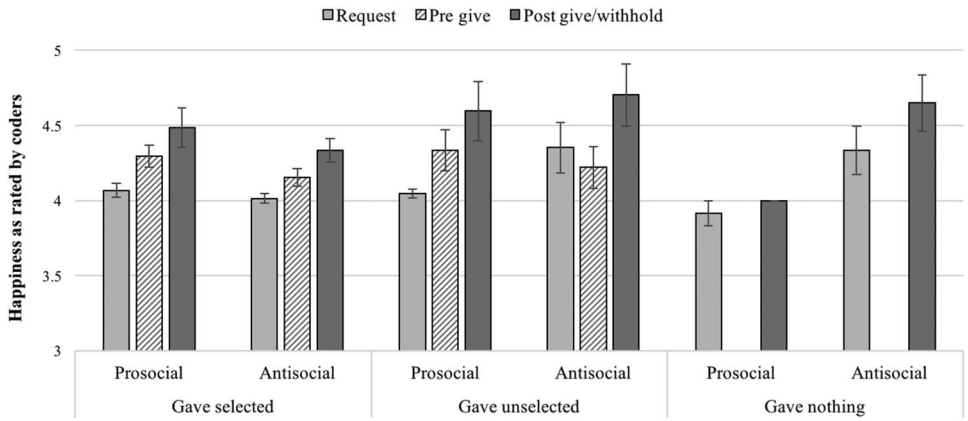

Figure 4. Toddlers' happiness, as rated by coders, during the puppet's request, pregiving (if applicable), and postgiving/withholding in Experiment 1; error bars reflect standard error of the mean.

the puppet's request and the pregiving phase, and (b) the pregiving and postgiving phases. Toddlers' happiness increased from the request phase ($M = 4.103$, $SD = .286$) to the pregiving phase ($M = 4.253$, $SD = .329$; paired samples t test, $t[49] = 2.986$, $p = .004$, $d = .422$), potentially indicating that toddlers experience a happiness boost during social interactions and/or in anticipation of giving to the puppet. Happiness further increased from the pregiving phase ($M = 4.253$, $SD = .329$) to the postgiving phase ($M = 4.503$, $SD = .539$; paired samples t test, $t[49] = 3.578$, $p = .001$, $d = .506$), consistent with previous evidence demonstrating that toddlers experience a happiness boost after performing a prosocial act.

To examine whether toddlers simply experienced a happiness boost over time (e.g., not because they had just engaged in a giving behavior), we also looked for changes in happiness across phases for toddlers who withheld. Like toddlers who gave, toddlers who withheld showed no initial difference in happiness when faced with a prosocial ($M = 3.917$, $SD = .118$) versus antisocial ($M = 4.333$, $SD = .509$) puppet's request for a toy (independent samples t tests, $t[10] = 1.110$, $p = .293$, $d = .942$). There was also no change in happiness from the request to the withholding phase (mixed ANOVA with happiness in the request and withholding phases as the within-subjects variables and condition [prosocial, antisocial] as a between-subjects factor, $F[1, 10] = .878$, $p = .371$, $\eta_p^2 = .081$), no effect of condition, and no interaction between condition and phase (mixed ANOVA, both Fs < 2.393, ps $> .152$). Toddlers were equally happy when the puppet requested a toy ($M = 4.264$, $SD = .490$) and while withholding a toy ($M = 4.542$, $SD = .591$). Of course, given the small number of toddlers who refused to give a toy ($n = 12$), particularly in the prosocial condition ($n = 2$), these results should be interpreted with caution.

Discussion

In sum, toddlers in Experiment 1 were discriminate in their prosocial behaviors: Toddlers' giving behaviors differed depending on whether their interaction partner had previously been prosocial or antisocial. Toddlers were more likely to give selected toys (a clearly prosocial response) to prosocial puppets rather than antisocial puppets, and equally likely to give unselected toys (an ambiguously prosocial response). Further, toddlers were less likely to give to antisocial puppets at all; we found this result somewhat surprising given the social demands to comply with the puppets' direct and repeated request for a toy. Overall, these results demonstrate that toddlers' prosociality is sensitive to both the prosocial/antisocial status of a recipient, as well as to the inferred preferences of prosocial recipients. These results also suggest that toddlers are neither "indiscriminate altruists" who are equally prosocial to everyone, nor limited to partner-choice models of selective prosociality in which toddlers choose whom is a better target of prosocial behavior but treat all individual interaction partners the same: Here, toddlers' prosocial behavior differed based on the previous behavior of a single interaction partner, consistent with partner-fidelity models of selective prosociality.

In contrast to their giving behavior, toddlers' emotional reactions before and after giving were indiscriminate. Toddlers displayed an increase in happiness during their interaction with the puppet and were happiest after giving the puppet a toy. This happiness boost was not influenced by the puppet's prosocial versus antisocial status or by whether the toddler provided the preferred toy.

In Experiment 1, puppets displayed their toy preference by repeatedly selecting the rare toy from a box containing mostly another kind of toy. We expected that toddlers would infer toy preference from this demonstration because previous work has shown that young children infer that the selection of a nonrandom, low-probability sample is consistent with a preference or desire for one item over another (Kushnir et al., 2010; Ma & Xu, 2011; Wellman et al., 2016). However, it is possible that toddlers in Experiment 1 did not consider the population from which the selected toys were chosen (e.g., that the selected toys were rare, and thus the selection indicated a preference) but merely noted the kind of toy removed from the box and formed an association between the puppet and the selected toy. In other words, toddlers may have been simply matching two objects that tended to occur together (a puppet and a particular toy) and reproduced that match in the case of the prosocial puppet's request. This alternative account is problematic because it would suggest that toddlers were not engaging in *prosocial* behavior by giving the prosocial actor the selected toy but were merely engaging in more matching when presented with a prosocial versus antisocial puppet.

To challenge this alternative explanation, we replicated Experiment 1 with one critical difference—rather than having the puppet select five of the seven rare toys, the puppet selected five of the 31 common ones. Importantly, having the puppet select common toys entails that toddlers should *not* infer a toy preference, as one could easily select a common toy in five consecutive trials by chance alone. Further, previous work has shown that toddlers do not infer a toy preference from the repeated selection of the common toy in this paradigm (Kushnir et al., 2010). As such, we predicted that toddlers would no longer demonstrate behavioral selectivity when deciding *what* to give and would be equally likely to provide the prosocial and antisocial puppet with the selected versus unselected toy. If so, this finding would suggest that toddlers' behavioral responses in Experiment 1 were based on inferred toy preference rather than simple matching.

Though toddlers should not infer a toy preference from the repeated selection of the common toy, toddlers could still demonstrate behavioral selectivity regarding *whether* to give as in Experiment 1. As such, we predicted that toddlers may engage in selective withholding from the antisocial puppet, despite the social demands to provide the puppet with a toy when explicitly asked to do so. Finally, based on the results in Experiment 1 we predicted that toddlers in Experiment 2 would show an increase in happiness after giving, but that this emotional reaction would not differ based on the recipient or the toy provided.

Experiment 2

Method

Participants. Sixty-four full-term, healthy toddlers who heard 80% to 100% English (32 males, $M_{age} = 20.02$ months, range = 19.17–20.63) participated. Twenty-three additional toddlers were excluded for procedural/technical errors ($n = 3$), fussiness ($n = 8$), parental interference ($n = 2$), giving both a selected and an unselected toy at the same time during giving phase ($n = 1$), and failure to complete the warm-up task ($n = 9$; five were assigned to

prosocial condition, four to antisocial condition). We set a stopping rule of 32 toddlers per condition to align with the sample size of Experiment 1.

Procedure. The procedure in Experiment 2 was identical to Experiment 1, except that during the "preference" display in Experiment 2, the girl puppet (prosocial or antisocial, depending upon condition) removed five of the common toy from the box containing duck and frog toys. This display is consistent with random sampling, and suggests that the puppet's selections are not because of personal preference.

Coding. The behavioral variable of interest was again whether toddlers gave the selected toy, the unselected toy, or nothing following the puppet's request. Toddlers' happiness was again rated on a 1-to-77 scale (as in Aknin et al., 2012, 2015; average $\alpha = .774$). For toddlers who gave, happiness was rated during three phases: during the puppet's request, after the request but pregiving, and postgiving. For toddlers who did not give, happiness was rated during two phases: during the puppet's request, and while withholding from the puppet. As in Experiment 1, "while withholding" ratings reflect happiness after the first request but before the second; 81% of givers in the prosocial condition and 75% in the antisocial condition gave before the second request in Experiment 2.[4]

Results

Attention. Unlike in Experiment 1, there was no difference in looking times following prosocial and antisocial events. Across conditions, toddlers looked equally long following prosocial events ($M = 12.681$, $SD = 5.523$) and antisocial events ($M = 11.747$, $SD = 5.770$; paired samples t test, $t[62] = 1.491$, $p = .141$, $d = .188$). As in Experiment 1, toddlers in Experiment 2 watched prosocial ($M = .984$, $SD = .032$) and antisocial ($M = .988$, $SD = .030$) puppet's preference displays for an equal proportion of the total display time (independent samples t test, $t[61] = .508$, $p = .614$, $d = .130$).

Giving.

Preliminary analyses. Preliminary tests examined the role of participant characteristics, attention, and counterbalanced variables on giving behaviors. A series of Pearson chi-square tests revealed no effect of the following binary variables on toddlers' tendency to (a) give a toy versus give nothing, or (b) give the selected versus unselected toy across conditions: order of antisocial event, antisocial puppet hair color, antisocial puppet side, selected object, side of selected object during giving (Pearson chi-square, all χ^2s < 1.143, all ps $> .284$). Although there was no effect of gender on the tendency to give versus withhold (Pearson chi-square, $\chi^2[1] = .097$, $p = .756$), there was an effect of gender on the tendency to give the selected versus unselected toy across conditions (Pearson chi-square, $\chi^2[1] = 5.993$, $p = .014$), such that males were more likely to give the unselected toy. Though it is possible that males were more attracted to the unselected toy than were females (i.e., the toy that was rare in the population and not highlighted by the puppet), we think this result is likely spurious given that this gender effect was not observed in Experiment 1. A series of one-way ANOVAs revealed no effect of the following continuous variables on tendency to give versus withhold or tendency to give selected versus unselected: toddlers' age, attention to the preference display, attention following prosocial events, attention following antisocial events across conditions (one-way ANOVA, all Fs < 3.510, all ps $> .065$). Given the lack of significant results aside from gender and because no differences were predicted, none of these variables are considered further.

Confirmatory analyses. As predicted, toddlers' giving behaviors (gave selected, gave unselected, gave nothing) did not differ depending on the prosocial/antisocial status of the puppet when toy selection suggested random sampling rather than personal preference (Pearson chi-square, $\chi^2[2] = .945$, $p = .623$, $V = .122$; see Figure 5). Of the 32 toddlers asked for a toy by the prosocial puppet, 10 gave the selected toy, 17 gave the unselected toy, and five gave nothing in the elapsed time. Of the 32 toddlers asked for a toy by the antisocial puppet, eight gave the selected toy, 16 gave the unselected toy, and eight gave nothing. Although as in Experiment 1 more toddlers withheld toys from the antisocial ($n = 8$) versus the prosocial puppet ($n = 5$), this pattern did not reach significance in Experiment 2 alone (adjusted standardized residual, $z = .932$, $p = .351$). That said, the difference in likelihood of giving versus withholding to prosocial versus antisocial requesters remains significant across Experiments 1 and 2 combined (adjusted standardized residual, $z = 2.453$, $p = .014$; compared with Bonferroni corrected alpha value of .017).

As in Experiment 1, toddlers were equally fast to give either the selected toy ($M = 1.889$, $SD = 1.367$) or unselected toy ($M = 2.000$, $SD = 1.346$), on average giving between the first and second requests (independent samples t tests, $t[49] = .280$, $p = .781$, $d = .084$). Suggestive that toddlers were not simply reluctant to interact with an antisocial puppet, toddlers who gave were equally fast to give to the prosocial ($M = 1.926$, $SD = 1.357$) versus the antisocial puppet ($M = 2.000$, $SD = 1.351$; independent samples t tests, $t[49] = .195$, $p = .846$, $d = .056$). Finally, as in Experiment 1, those who gave and those who withheld in the giving phase were equally willing to give toys to the lion puppet in the warm-up; there was no difference in the length of time before givers' ($M = 19.340$, $SD = 44.849$) and withholders' ($M = 37.615$, $SD = 67.193$) first willing give (independent samples t tests, $t[58] = 1.160$, $p = .251$, $d = .370$), or between the proportion of giving rounds in which givers ($M = .885$, $SD = .201$) and withholders ($M = .817$, $SD = .234$) willingly released the toy to the puppet (independent samples t tests, $t[58] = 1.036$, $p = .305$, $d = .330$).

Emotional reactions. As in Experiment 1, we first focused only on those toddlers who provided a toy in response to the puppet's request. For these toddlers, there was no initial difference in happiness when faced with a prosocial ($M = 4.067$, $SD = .308$) versus antisocial ($M = 4.073$, $SD = .173$) puppet's request for a toy (independent samples t tests, $t[46] = .079$, $p = .937$, $d = .023$). Also as in Experiment 1, there was a significant change in

[4] Looking time data was missing for one toddler in the prosocial condition (gave nothing) because of technical error. Happiness could not be coded for four toddlers because of technical error ($n = 2$), the use of pacifier that covered the mouth ($n = 1$), and the inability of coders to code from an intact video ($n = 1$), two toddlers in the prosocial condition (gave selected, gave unselected), and two in the antisocial condition (gave unselected, gave nothing). Attention to the preference display could not be coded for one of these toddlers (antisocial condition) because of the same technical error.

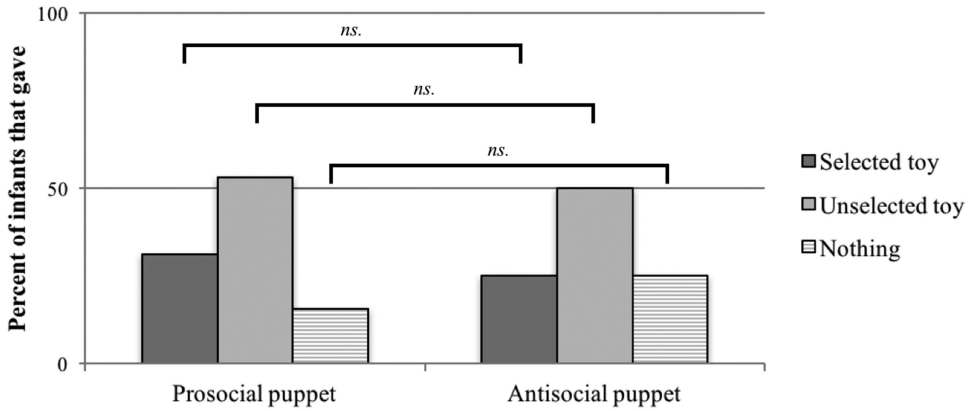

Figure 5. Percent of toddlers who gave the prosocial or antisocial puppet the selected toy, unselected toy, or nothing in Experiment 2 when toy preference could not be inferred.

happiness across the three phases (during the puppet's request, after the request but pregiving, and postgiving; mixed ANOVA with happiness in each phase as the within-subjects variables and condition [prosocial, antisocial] and toy given [selected, unselected] as between-subjects factors, $F[2, 88] = 10.033$, $p < .001$, $\eta_p^2 = .186$, see Figure 6). This difference in happiness was not influenced by whether the puppet was prosocial or antisocial, whether the toy to be given was the selected or unselected toy, nor the combination of these variables (mixed ANOVA, all Fs < 2.061, ps $> .157$).

To determine when happiness changed across the three phases, we examined the difference in happiness between (a) the puppet's request and the pregiving phase, and (b) the pregiving and postgiving phase. Unlike Experiment 1, toddlers were equally happy during the request phase ($M = 4.069$, $SD = .250$) and the pregiving phase ($M = 4.188$, $SD = .586$; paired samples t test, $t[47] = 1.362$, $p = .180$, $d = .197$), suggestive that toddlers did not experience a happiness boost simply from interacting with the puppet or in anticipation of giving to the puppet when there was no clear toy preference. That said, as in Experiment 1, happiness increased from the pregiving phase ($M = 4.188$, $SD = .586$) to the postgiving phase ($M = 4.455$, $SD = .428$; paired samples t test, $t[47] = 3.227$, $p = .002$, $d = .466$), suggestive that toddlers experienced a happiness boost after giving.

As in Experiment 1, we also examined whether toddlers simply experienced a happiness boost over time by looking for a change in happiness across phases for toddlers who withheld. For toddlers who withheld, there was no initial difference in happiness when faced with a prosocial ($M = 4.267$, $SD = .713$) versus antisocial ($M = 4.071$, $SD = .252$) puppet's request for a toy (independent samples t tests, $t[10] = .679$, $p = .513$, $d = .435$). There was also no change in happiness from the request to the withholding phase (mixed ANOVA with happiness in the request and withholding phases as the within-subjects variables and condition [prosocial, antisocial] as a between-subjects factor, $F[1, 10] = 2.494$, $p = .145$, $\eta_p^2 = .200$), no effect of condition, nor the combination of condition and phase (mixed ANOVA, both Fs $< .371$, ps $> .556$). Toddlers were equally happy while withholding a toy ($M = 4.431$, $SD = .543$) as they were during the puppet's request ($M = 4.153$, $SD = .479$). As in Experiment 1, given the small number of toddlers who refused to give a toy, these results should be interpreted with caution.

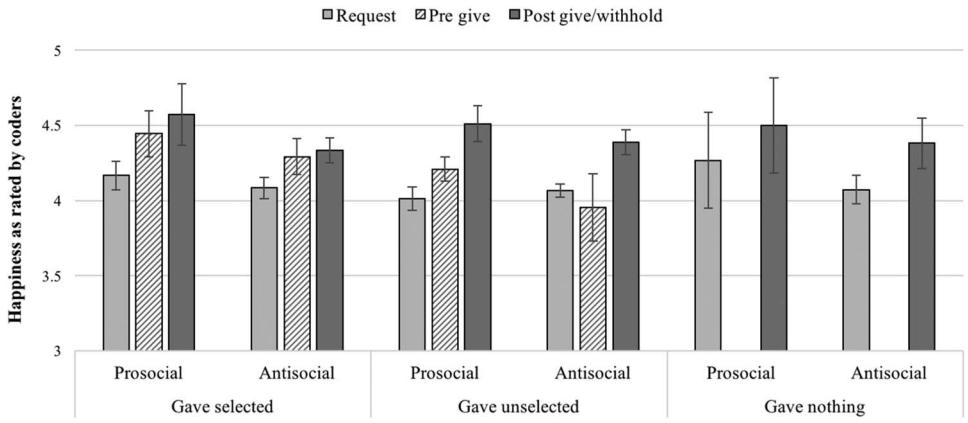

Figure 6. Toddlers' happiness, as rated by coders, during the puppet's request, pregiving (if applicable), and postgiving/withholding in Experiment 2; error bars reflect standard error of the mean.

Discussion

As predicted, when information regarding the toy preference of prosocial and antisocial actors was unknown, toddlers' giving behaviors were not selective. This suggests that giving behaviors in Experiment 1 were based on a preference attribution, rather than a simple association between the prosocial puppet and the selected toy, providing strong support that toddlers are selectively prosocial toward deserving recipients. Further, although as in Experiment 1, more toddlers withheld toys from the antisocial puppet than from the prosocial puppet, this difference did not reach significance in Experiment 2 alone. Although this is consistent with the social demands to give introduced by the current procedure (e.g., a warm-up game that involved giving, a direct request from the puppet for "one" toy), it is also possible that this failure to replicate selective withholding from the antisocial puppet may be because of the small number of toddlers who refused to give; note that toddlers are significantly more likely to withhold from the antisocial versus prosocial puppet when collapsing across experiments. Alternatively, the ambiguity of the information presented in Experiment 2 (i.e., the puppet's reason for removing toys from the box when a preference could not be inferred) may have resulted in less consistent responding in Experiment 2 compared with Experiment 1. Future studies should confirm whether toddlers are willing to refuse an antisocial individual's direct requests and whether such refusals reflect the motivation to punish the antisocial individual for their past transgressions.

Toddlers' emotional reactions continued to be unselective in Experiment 2. When toddlers did give, they experienced a happiness boost directly following their prosocial act, regardless of whether they provided the selected or unselected toy to the prosocial or antisocial puppet.

General Discussion

The present research supports the possibility that early prosociality is behaviorally selective but (comparatively) emotionally indiscriminate. In the first demonstration of selective prosociality toward a single individual, toddlers in Experiment 1 used information about recipients' preferences to modulate their performance of prosocial behaviors. Specifically, toddlers were more likely to give selected toys to prosocial rather than antisocial others, and were more likely to withhold toys from antisocial rather than prosocial others. Intriguingly, although toddlers in Experiment 1 were happier after giving than before giving, this happiness boost was not influenced by whether they gave the selected or unselected object to the prosocial or antisocial requester. In Experiment 2, when toddlers lacked information about the puppet's toy preferences, they did not modulate their giving behaviors based on the requester's past behaviors. As in Experiment 1, toddlers in Experiment 2 displayed increased happiness after giving, regardless of whether they gave to a prosocial or antisocial puppet or provided a selected versus unselected toy.

Potential Limitations of the Current Studies

One concern is that toddlers may have experienced a boost in happiness after complying with a request (i.e., to give a toy), without being sensitive to the prosocial nature of the giving action itself. We believe this alternative explanation is unlikely for two reasons. First, our data suggest that compliance is not *necessary*; when the puppet's toy preference was clear (Experiment 1), it is presumably more obedient to provide the selected toy rather than the unselected toy. However, the observed increase in happiness was not influenced by whether the selected or unselected toy was given. Second, previous work suggests that compliance is not *sufficient*; young children experience a greater increase in happiness after engaging in costly sharing, rather than noncostly sharing, though both acts follow a request (Aknin et al., 2012, 2015).

A second concern is that toddlers in Experiment 1 did not experience a boost in happiness because of giving, but rather a simple increase in happiness over time (i.e., increase in happiness from the request phase to the pregiving phase, and then from the pregiving phase to the postgiving phase). Because the order of events (puppet's request, pregiving, postgiving) could not be counterbalanced, we cannot rule out this alternative explanation. That said, toddlers who withheld in both experiments did not display an increase in happiness over time; but note that this result should be interpreted with caution given the small number of withholders (12 toddlers in Experiment 1, and 13 toddlers in Experiment 2). Further, toddlers in Experiment 2 did not display an increase in happiness over time in the first half of the giving phase (from the request phase to the pregiving phase); rather, these toddlers only displayed a happiness boost after engaging in a prosocial act. Overall, we think that the observed increase in happiness is most likely associated with the performance of a prosocial act, consistent with the findings of Aknin et al. (2012, 2015), in which giving events were counterbalanced.

A final concern is that toddlers' happiness boost during the giving phase was not influenced by whether they provided the selected or unselected object because they did not differentiate between the two items. Although the pattern of giving behaviors across conditions and experiments suggests that infants did represent the distinction between the selected and unselected toys, it is possible that the strength of this representation was insufficient to moderate their emotional reaction following giving. Future work should continue to explore whether toddlers' emotional reactions following the performance of prosocial acts are discriminate (i.e., sensitive to the relative prosociality of their own act and/or the deservingness of the recipient).

Motivations Underlying Infants' Prosociality

Considering toddlers' behavioral and emotional responses together, these results suggest that early prosociality is modulated by several underlying motivations, only some of which are selective. One motivation seems to be deservingness: This and previous studies have demonstrated that, in some cases, toddlers are more prosocial toward prosocial others. While previous studies have shown that early prosocial behaviors are consistent with partner-choice models of cooperation (see Kuhlmeier et al., 2014, for discussion), the present studies demonstrate that young children can also be selective in one-on-one interactions when they can reasonably infer preference information from observed behavior. The performance of prosocial behaviors toward prosocial others and less prosocial (or antisocial) behaviors toward antisocial others in one-on-one interactions is consistent with partner-fidelity models of cooperation, in which cooperative acts are reciprocated and

uncooperative acts are punished to maintain large-scale cooperative systems (e.g., Axelrod & Hamilton, 1981; Bull & Rice, 1991).

In support of this motivational claim, it is worth comparing giving rates in our study, in which children had information about the prosocial/antisocial status of the puppet and the puppet's preferences, and Kushnir et al.'s (2010) original study, in which toddlers only had preference information. Toddlers in the prosocial condition of the current Experiment 1 were marginally more likely to give the selected toy versus provide a different response than in Kushnir et al. (Kushnir et al.'s 14 selected, 10 unselected, 4 none [50% gave selected]—vs. our 23 selected, 7 unselected, 2 none [72% gave selected]; Pearson's chi-square, $\chi^2 = 3.02$, $p = .082$). Similarly, toddlers in the antisocial condition were more than twice as likely to withhold giving compared with Kushnir et al. This suggests that information about recipients' prior prosocial/antisocial behavior increased toddlers' motivation in both directions (i.e., both to give and to withhold).

A second motivation for prosocial behavior may be the emotional benefits inherent to engaging in any prosocial act: Here, toddlers reaped emotional rewards regardless of the prosocial status of the recipient of their act of giving. This pattern of results is consistent with previous work showing that toddlers experience a boost in happiness following other prosocial acts (Aknin et al., 2012, 2015). Importantly, the current studies demonstrate that the experience of happiness after giving is not specific to the sharing of treats in one paradigm (i.e., the costly and noncostly sharing of cookies and candy). The current studies also reveal that toddlers experience emotional rewards when not complying with direct requests to perform specific sharing actions with a neutral recipient (e.g., experimenter asking child, "Will you give one of your treats to Monkey?" in a situation in which the toddler knows nothing about Monkey's prosocial/antisocial status; Aknin et al., 2012, 2015).

The pattern of results observed in the current studies may help explain the prevalence of conflicting reports on selective prosociality in toddlers, in which toddlers sometimes look selectively prosocial and other times do not. Specifically, if prosocial acts lead to happiness boosts regardless of recipient, young children may sometimes choose to be prosocial no matter who is targeted (see Paulus & Moore [2017] for evidence that preschoolers recognize the link between prosociality and positive feelings). This might explain why 2-year-olds seem willing to help anyone, even someone who has refused them assistance in the past (Warneken & Tomasello, 2013b), and why 27-month-olds first choose to help a prosocial actor but subsequently help an antisocial one (Dahl et al., 2013). Indeed, in past demonstrations of selective prosociality, toddlers may well have helped or shared with antisocial targets after their initial prosocial behavior toward prosocial ones, had they been given an opportunity to do so (Dunfield & Kuhlmeier, 2010; Hamlin et al., 2011).

Overall, this work adds to the growing literatures that from very young ages, humans are both impressively prosocial and impressively evaluative. Further, it adds to the literature examining what factors influence the frequency or extent of prosocial acts in early childhood (e.g., Chernyak & Kushnir, 2013; Chernyak, Sandham, Harris, & Cordes, 2016; Hay, Castle, Davies, Demetriou, & Stimson, 1999), and supports the general notion that prosociality is neither a single construct (Dunfield & Kuhlmeier, 2013) nor driven by a single motivation. This work suggests that it may be premature to describe toddlers as either selectively prosocial or indiscriminately altruistic, and calls for future studies to explore the moderating factors underlying children's selective and indiscriminate altruism.

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