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AUTHOR: Jayd Blankenship

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THESIS COMMITTEE CHAIR


SIGNATURE

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Carrick Williams, PhD
THESIS COMMITTEE MEMBER


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Marie Thomas, PhD
THESIS COMMITTEE MEMBER


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Preschoolers Selectively Trust and Selectively Share Based on the Mental States of Others

Jayd Blankenship

California State University San Marcos

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Preschoolers Selectively Trust and Selectively Share Based on the Mental States of Others

Adults understand that every new person they meet has unique qualities and that individuals vary in their character profiles. For example, the smartest child in a class may also be the meanest, or the next-door neighbor who generously invites a new neighborhood resident over for dinner may have a reputation as a terrible chef. In the real world, using such complex characteristics to make social judgments is not always a straightforward and effortless task. Individuals may be competent and possess valuable qualities in some domains, while simultaneously lacking competencies or value in other domains—and usually people have complex combinations of characteristics that differ in valence across domains. Thus, in social interactions we must carefully weigh the characteristics of partners to decide which are trustworthy, and which deserve our time, affection, or other resources. Though adulthood affords us the capacity to make decisions based on complex social information about others (e.g., seeking out those who will benefit us and avoiding those who will harm us), it is unclear when children begin to exercise such “social vigilance.”

Researchers have suggested that one way children process the social world is by assessing others' characteristics. We know quite a bit about how preschoolers make decisions when they are asked to reason about others—one trait at a time. For example, three- to five-year-olds can identify and choose to rely on sources who are more knowledgeable (Koenig & Harris, 2005), who have intentions to help rather than to deceive (Vanderbilt, Liu, & Heyman, 2011), and who are more confident in the information they provide (Jaswal & Malone, 2007). As further evidence, children also choose to share resources specifically with those that act prosocially rather than antisocially (Kenward & Dahl, 2011; Vaish, Carpenter, & Tomasello, 2010), with those who contribute more work than less work on a joint task (Kangeisser & Warneken, 2013),

and with individuals who are resource-poor over those who are resource-rich (Li, Spitzer, & Olson, 2014). However, much less is known about how children make social decisions when partners are described as possessing multiple characteristics at the same time. This distinction is important to highlight because the individuals that children (and people in general) encounter in everyday life invariably have complex qualities, often changing according to circumstance. And, certain social partners may have beneficial characteristics in one domain, but not in another. For example, a friend may have the best *intentions* for helping us study for a math test, but lack the necessary *knowledge* to assist. When do children begin to manage these social complexities by weighing the different benefits social partners offer, and choosing to interact with them selectively based on their traits? More specifically, when do children begin to apply information about a source's past accuracy to situations in which they are seeking correct testimony? And, when do children begin to use information about a source's prosocial behavior to make decisions about whether or not to share limited resources? In order to address these questions, the current study will examine how children use multiple pieces of information about a source's characteristics to make different kinds of everyday social decisions: about whether or not to trust information provided by a social partner, and whether or not to share resources with the same partner.

We chose to vary these two particular characteristics—accurate testimony and prosocial intentions—because they are frequently tested in the domain of social cognitive development (so there is much evidence to support children's reasoning about these characteristics when presented separately), and because both of these traits can vary independently of one another. For instance, it is possible for someone to be a poor source of information (e.g., always says the wrong answer), but still exhibit prosocial intentions or support.

In order to provide background for this study, first I will review the literature on children's evaluation of each of these characteristics, tested separately. Then, I will discuss related studies on preschoolers' reasoning about social partners with multiple characteristics.

Children's Evaluation of Whom to Trust

Researchers have examined the ways children use information about social partners to make decisions about whom to trust (for a review, see Mills, 2013; Koenig & Sabbagh, 2013). One way children determine a speaker's reliability is through past behaviors (Birch, Vauthier, & Bloom, 2008; Jaswal & Neely, 2006; Koenig, Clement, & Harris, 2004). For example, Koenig and Harris (2005) demonstrated that preschoolers preferred to learn from sources that had been accurate in the past rather than from sources that had been inaccurate in the past. In their study, children were presented with one informant who always labeled familiar objects by the correct name (i.e., calling a shoe a "shoe") and another informant who always labeled familiar objects by an incorrect name (i.e., calling a ball a "shoe"). Children were then asked to choose which of the two informants' labels they preferred to use (e.g., "danu" versus "loma") to label a novel object the child had never seen before. Results indicated that preschool-age children could correctly identify which speaker had been accurate, and subsequently *trusted* the source with a history of correct labeling. Thus, by four years of age, it appears children can use a source's past accuracy to predict their future accuracy. The tendency to trust a previously reliable informant has been found across many studies and is interpreted as an indication that children attend to certain favorable characteristics (e.g., accuracy) when determining the trustworthiness of a source (Koenig, Clément, & Harris, 2004; Scofield, Gilpin, Pierucci, & Morgan, 2012).

Further, studies have shown that children can monitor the extent to which sources are accurate by tracking the frequency of one's errors (Pasquini, Corriveau, Koenig, & Harris, 2007).

Pasquini et al. (2007) presented three- and four-year-olds with informants who correctly labeled objects at rates of 0%, 25%, 75%, or 100% across four trials. Three-year-olds did not trust informants who made even a single error (only trusting people who were correct 100% of the time), whereas four-year-olds used the sources' relative accuracy for selection of trustworthy sources (i.e. chose 75% over 25% accuracy). This finding suggests that by four years of age, children can identify who is *more* accurate between sources, rather than just the presence or absence of accuracy.

Other studies have demonstrated children's sensitivity to a source's confidence when deciding whom to trust. Jaswal and Malone (2007) investigated three-year olds' understanding of a source's confidence in their knowledge. For example, children watched as two experimenters labeled a hybrid object (e.g. spoon-key) as either "This is a spoon" to a less confident phrase, "I think this is a spoon." Children were less likely to trust the uncertain experimenter, suggesting that children were influenced by the simple presence or absence of a speaker's confidence about their knowledge when determining trustworthiness. Furthermore, Jaswal and Malone (2007) examined three-year-olds' ability to keep track of both the experimenter's errors and level of distraction, and they found that children trusted adults the least when they behaved in both a distracted way and gave erroneous information. This suggests children use information about social behavior to make decisions about the relative accuracy of sources, and rely on subtle characteristics regarding the accuracy of such sources.

In addition to identifying a source's level of accuracy, other research has revealed that children take into account the *reason* for a source's inaccuracy, based on others' access to information (Nurmsoo & Robinson, 2009a & Nurmsoo & Robinson, 2009b). Nurmsoo and Robinson (2009b) demonstrated that children assess a speaker's knowledgeability based on

information from both past accuracy and past access to relevant information. Three- to five-year-olds were presented with two puppets that labeled objects incorrectly; one puppet did so inexplicably, while the other puppet had on a blindfold. Preschoolers attributed the errors of the blindfolded puppet to a lack of knowledge access, and subsequently trusted the advice of the source after the blindfold was removed. Children attributed the errors of the other puppet to a lack of knowledge generally and were less likely to trust such sources in the future. This suggests children are sensitive not just to a source's reliability, but to situational factors that might influence their behavior.

There is also evidence that children selectively choose to trust social partners based on their favorable or unfavorable intentions. For example, Mascaro and Sperber (2009) investigated three- to five-year-olds' selective trust for either a benevolent or a malevolent puppet whose traits were established with demonstrations of the puppet either caressing or hitting the experimenter (and the experimenter stating, "The cow stroked me" or, "The frog hit me"). When given an opportunity to choose between a nice or mean source, three-year-olds were more likely to believe a nice puppet's advice. A follow-up experiment (using a search task) measured children's endorsement of an explicitly labeled "big liar" puppet, and Mascaro and Sperber (2009) found that while all of the three-year-olds followed the advice of the intentionally deceitful puppet, four-year-olds were more successful at ignoring the explicitly unreliable source. Thus, by age four, children seem to incorporate a source's intentionality into their decision of whom to trust.

Although the research presented thus far has provided examples of ways in which children evaluate a sources' characteristics by choosing whether or not to *trust* informants (Jaswal & Malone, 2007; Koenig & Harris, 2005; Mascaro & Sperber, 2009; Nurmsoo &

Robinson, 2009b), other researchers have focused on different social behaviors that reflect children's understanding of partners' characteristics—such as sharing (Kenward & Dahl, 2011; Olson & Spelke, 2008; Warneken & Tomasello, 2013).

Children's Evaluation of When to Share with Others

During the preschool years, children not only reason about testimony, they also develop ideas about social exchange and reciprocity (Dunfield, Kuhlmeier, & Murphy, 2014) and become more selective in choosing individuals they wish to allocate rewards to (Dunfield et al., 2014; Warneken & Tomasello, 2013). This is notable because, although trust in testimony represents reliance on information and knowledge, a child's decisions to share may be based on other (sometimes independent) social domains. For the purposes of this paper, sharing is used to describe the act of giving some of one's *own* resources to another individual, with the intention to benefit individuals other than one's self (Martin & Olson, 2015; Tomasello & Vaish, 2013).

In a typical sharing paradigm, children are invited to observe social characteristics of others and then asked to distribute resources between those characters (Olson & Spelke, 2008). In a seminal example, Olson and Spelke (2008) told preschoolers narratives about dolls—one doll was a protagonist and the other dolls were either prosocial (previously shared a penny) or antisocial (previously did not share a penny). Then, children were asked how many resources (e.g., out of three stickers) the protagonist doll should share with the other dolls. Children instructed the protagonist to selectively share more stickers with the prosocial doll, showing that preschoolers can identify a recipient's qualities in one domain and then use that information to decide who deserves more resources. These findings have been replicated across several studies that investigate children's sharing behaviors towards others based on a source's qualities

(Dunfield, Kuhlmeier, & Murphy, 2013; Kenward & Dahl, 2011; Warneken & Tomasello, 2013).

Further evidence shows that preschoolers discriminate between others who vary in their intentions when allocating resources (Kenward & Dahl, 2011). Kenward and Dahl (2011) found that three- and four-year-olds were sensitive to characters labeled as “helpers” and “hinderers.” Participants watched a scene with one struggling puppet that was helped by a second puppet and aggressively hindered by a third. Children were then asked to distribute biscuits between the helpful and harmful puppets. Kenward and Dahl (2011) discovered that by age four, children shared more with a helper than a hinderer, rewarding characters with favorable intentions more than those with unfavorable intentions.

When distributing resources, children are also sensitive to whether or not the recipient has shared with them (personally) in the past (Warneken & Tomasello, 2013). Warneken and Tomasello (2013) measured both sharing and helping behaviors in two- and three-year-olds who participated in a game (i.e., throwing marbles down a funnel) that was designed to make children both the initiator of sharing (i.e., the children could share their marbles when the puppet ran out) and the recipients of sharing (i.e., the puppet could offer marbles when the child ran out). Children were then given opportunities to share with a puppet that previously shared with them. Warneken and Tomasello (2013) found that by age three, a social partner's previous sharing influenced children's subsequent sharing, such that, if the puppet shared with the child, the child was likely to reciprocate, and if the puppet did not share with the child, the child responded in kind. These findings show that in the context of a cooperative setting, a recipient's prosociality can be influential in children's subsequent sharing behaviors.

Children have also been shown to selectively share based on others' information sharing. Dunfield, Kuhlmeier, and Murphy (2013) found that when three-year-olds receive information from sources with conflicting intentions, they also employ selectivity in their own sharing of information. Dunfield et al. (2013) investigated children's assessment of characters that *shared* the identity of a covered picture (i.e., helpful condition, "I know! It's a cupcake!") or *withheld* the identity (i.e., sneaky condition, "I know but I'm not telling") before giving the child an opportunity to also reveal or withhold the identity of a novel hidden picture to each source. The researchers found that children selectively rewarded the helpful character more frequently than the sneaky character by sharing the identity of a novel object to the more helpful character when it was the child's turn to share. This indicates children identify the intentions of their social partners and reciprocate accordingly within in the domain of information sharing, choosing to share their information only with those who acted prosocially.

Taken together, this research suggests that by the preschool years, children are able to decide which of two social partners possesses a more valuable social quality, but less is known about children's understanding of characteristics in social partners that are more complex. To date, a handful of studies have investigated children's social evaluations when more than one quality of a source is made explicit.

Children's Evaluation of Sources with Multiple Characteristics

There is little evidence to suggest how children may use more complex information to make diverse social choices about how to interact with social partners. However, a small set of studies have investigated children's ability to take different characteristics into account to make a single social decision, such as to trust a source that intends to help but lacks relevant knowledge.

Some studies have investigated how children weigh multiple characteristics that could affect a source's trustworthiness. For example, Liu, Vanderbilt, and Heyman (2013) asked five- and six-year-olds to find the location of a prize using the advice of a single source that *initially* varied along two dimensions: accurate or inaccurate knowledge, and good or bad intentions. For example, during training trials, children observed a source with accurate knowledge and good intentions try to help another person find a hidden prize, whereas a source with inaccurate knowledge but good intentions tried to help but accidentally identified the wrong box. But in all conditions, on test trials, children were told the source was now explicitly *knowledgeable* about the location of the prize—thus eliminating that cause of past mistakes. Liu et al. (2013) revealed that children were influenced by the source's intentionality to some degree, but outcome (i.e., identifying the correct box regardless of the source's intentions or knowledge) was weighted more in their decisions to trust. Interestingly, follow-up inference questions revealed that children related sources with positive intentions as positive in other capacities (i.e., more likely to help someone pick up dropped papers), demonstrating an understanding of the sources' underlying mental states. Liu et al. (2013) reasoned that children (e.g. five- and six-year-olds) may have difficulty interpreting internal traits (such as one's intentions to help), but external outputs could be more salient factors in social decision making and, ultimately, easier for children to understand.

Children also use a source's traits to guide their endorsements, but the choice is less clear when the traits conflict (Fiske, Cuddy, & Glick, 2007; Landrum, Mills, & Johnston, 2013). Landrum et al. (2013) documented three- to five-year-olds' selective trust towards sources that varied in competence (knowledgeable or ignorant) and benevolence (nice or mean). For instance, children at all ages weighted benevolence information more than expertise—when presented

with a mean expert (e.g., eagle or bicycle expert) and a nice non-expert, children trusted the non-experts who were nice, even though they clearly did not know the correct answer. Thus, children are able to identify certain social and intellectual qualities, but it is unclear when they understand how to use appropriate information for relevant situations if they are only measured on one social choice (e.g., trust).

Another important factor in early social learning is to discount unrelated characteristics when making social decisions. A study by Li, Heyman, Xu, and Lee (2014) investigated children's ability to use only appropriate social characteristics to make trust-relevant decisions. Li and colleagues presented children with two characters that had a combination of traits: sources were either honest or dishonest (made either true or false claims about owning a stuffed animal), and they possessed an unrelated positive or negative trait (they were described as either clean or dirty). Children were asked which character they preferred to ask for the location of a hidden doll (hidden in either a box or a basket). Five-year-olds were more successful at using trustworthy-related qualities (honesty) rather than unrelated qualities (cleanliness) to inform their trust judgments. This study demonstrates that by age five children can focus on the information about a source that is most relevant to the task at hand, while ignoring other, unrelated characteristics of social partners.

There is also evidence that children choose to *allocate* resources as a complex function of group membership and morality. Hetherington, Hendrickson, and Koenig (2014) investigated preschoolers' group membership biases (accompanied by conflicting moral behavior) with measures of epistemic trust and resource distribution. Four- and five-year-olds watched video clips about antisocial in-group members, prosocial out-group members, and neutral controls. Prosocial characters shared a candy bar and anti-social characters did not; in-group members

wore the same color shirt as the child and out-group members wore a different shirt color (red or blue). Children were then asked to choose which group member they would selectively endorse for advice in a search task. Additionally, children were asked to distribute five coins (that did not belong to the child) between the two characters. Interestingly, the preschoolers relied on group status for selective trust, but moral behavior for resource allocation, suggesting that sharing behaviors are more strongly influenced by prosocial behaviors than group membership. These findings further imply that children may rely on one social characteristic to make judgments in one context, but rely on another characteristic to make judgments in another domain.

These studies (e.g., Hetherington et al., 2014; Vanderbilt et al., 2011) highlight the idea that although children use mental state information to predict behavior (such as trustworthiness), they also use source characteristics to make other kinds of social appraisals (e.g., whether they will help others in need, whether they are deserving of rewards, and even how fast they are likely able to run). Thus, measures of selective trust or selective sharing alone may not be enough to fully describe children's assessments of a social partner's characteristics and interpersonal value. Combining a measure of selective trust with a separate measure of selective sharing may help to demonstrate children's understanding of a source's multiple, diverse characteristics.

Current Study

In real world interactions, the social partners we encounter possess many different characteristics that we must learn to interpret in order to effectively predict behavior and navigate social interactions. How do children weigh and manage complex social information in order to make important decisions involving others? Specifically, if children are explicitly given information about the accuracy of a source's testimony *and* their pro- or antisocial intentions, will children use accuracy information to decide whether to take a source's advice, and use

information about prosocial intentions to decide whether to share earned resources? Do children use appropriately relevant information to make social decisions? The present study addresses these important questions.

By combining the two measures of selective trust and selective sharing, the present work will be able to ascertain whether children understand sources as having multiple, separate characteristics that are relevant to different social decisions. The current study examines preschool-age children's ability to reason about the characteristics of individual sources, as measured by their willingness to trust and share with those sources. In this study, children will interact with one of four possible social partners whose profiles vary in valence along two dimensions: knowledge and prosociality, creating four partner profiles: 1) "*Helpful*:" prosocial, and gives correct information (on purpose), 2) "*Silly*:" prosocial, but gives incorrect information (by mistake) 3) "*Tricky*:" antisocial, and gives incorrect information (on purpose), and, 4) "*Wile*" (named for Wile E. Coyote, the cartoon character who always tries to harm the Roadrunner but never succeeds): antisocial but gives correct information (by mistake). These social partners will subsequently provide advice to children about where to look for an object in a search task, in which the child wins prizes for correct guesses. After receiving their earned prizes, children will have an opportunity to share them with the social partner. Children's performance will be measured on how frequently they trust each character's advice in the search task, and on the number of prizes they choose to share with their partner. Children will also be asked follow-up questions about their impressions of the sources.

Because these two measures have never been used in the same study, it is unknown how children will use these pieces of information to make decisions about the same social partner. There are several possible outcomes, each with support from previous studies.

First, it is possible that children will trust accurate sources and share with prosocial sources, using task relevant social information to inform their judgments on each task, just as they do when these characteristics are presented separately. Because preschoolers use a source's demonstrated reliability to inform their trust decisions (Koenig & Harris, 2005; Vanderbilt et al., 2011) and use a source's demonstrated prosociality to inform their sharing behaviors (Dunfield et al., 2013; Kenward & Dahl, 2011), it is possible they will also be able to separate these characteristics, and rely on separate characteristics independently when asked to make decisions about whether to trust and share with sources. Doing so infers that children consider these characteristics to be independent of one another, and relevant to different social decisions.

However, there is also the possibility that children may not differentiate neatly between sources along these dimensions. For instance, children might use sources' characteristics to differentiate between social partners on one measure but not the other. If this occurs, children may demonstrate sophisticated reasoning about the reliability of sources, but not differentiate on measures of prosocial behavior. Liu et al. (2013) found that children tended to focus on outcome information (whether the source's testimony led to a successful outcome) over information about a source's intentions (whether the source intended to provide good information, or did so accidentally). Therefore, it is possible we will observe the same pattern in our study: with children differentially trusting sources whose advice leads to successful searches, but then either sharing equally with all sources (replicating findings from Kenward and Dahl, 2011), or sharing more with sources whose testimony led to correct *outcomes* (regardless of whether the partner intended it to do so). Such a finding would suggest that children tend to weigh outcome information more heavily than information about intentions and goals (Liu et al., 2013) when making social decisions. It may also suggest that children do not fully understand the

implications of others' intentions, or do not critically consider others' intentions as long as the source provided accurate information.

Of course, the reverse is also possible. For example, children may *trust* sources indiscriminately—such as trusting all sources all the time—but share selectively with sources that demonstrate good intentions. Evidence for this outcome derives from looking across studies in the two literatures which collectively show that children demonstrate the ability to judge the prosocial intentions of others prior to demonstrating selective trust of only accurate sources (Dunfield, Kuhlmeier, O'Connell, & Kelley, 2010). Studies of selective trust typically demonstrate that children selectively endorse more accurate sources by the age of three or four, while studies investigating sharing and understanding of prosocial intentions suggest that children understand these dimensions by age two and even during the first year of life (Hamlin, Wynn, & Bloom, 2007; Hamlin & Wynn, 2011). Such a finding would suggest that children are sensitive to the intentions, and prosocial nature, of others before they are sensitive to others' accuracy, or are able to use past accuracy to predict future accuracy. Relatedly, children may erroneously assume that someone who has good intentions will invariably provide good advice, perhaps assuming that if an individual possesses one positive characteristic, then all of their other characteristics will also be positive in valence (Boseovski & Lee, 2008).

Thus, it is unknown how children will use diverse information about sources' characteristics to make different social decisions. Because existing studies suggest differing possible outcomes about how children may use different kind of information, it is especially important to understand when children begin to use only relevant information to make appropriate social decisions.

Using measurements of selective trust, selective sharing, and follow-up questions, I hypothesize the following:

H₁: There will be a main effect of outcome on trust; children will generally trust a source with positive outcomes (correct advice) more than negative outcomes (incorrect advice).

H₂: There will be a main effect of intention on sharing; children will share with a source that has good intentions more than negative intentions.

H₃: There will be an interaction between intention and outcome on sharing behaviors. The effect of sharing based on outcome will differ across intention conditions.

Method

Participants

We tested 168 preschool-aged children ranging from three- to five-years-old. Boys and girls were equal in numbers for each condition. Subjects were recruited and tested at a children's museum in Southern California. The ethnicity breakdown was approximately 55% Caucasian, 12% Hispanic-Latino, 10% Asian-Pacific Islander, 3% African American, 6% identified as "Other," and 14% chose not to disclose ethnicity information.

Procedure and Materials

General Procedure. In an individual session, after training, each child completed three general tasks: a search task, follow-up questions, and a sharing task.

After gaining parental permission (through a consent form asking if their child could participate) and assent of the child, children were randomly assigned to one of the four conditions. Every child was tested in an area of the museum designated for research and they were asked if they wanted to play a game to win stickers.

Training/Manipulation. After assent, children were invited to sit at a small table across from two people: an experimenter (E1) and another person that directed “Monkey,” a hand-puppet (E2).

E1 told participants about a “finding game” in which Monkey hid an object in one of two boxes and the goal was to find the hidden object. Two small boxes (one yellow and one green in color) and the hidden object—one round, flattened marble (“bead”)—were placed on the table in front of the child. Participants were told they could trade the “beads” they find for sticker prizes to take home at the end of the game.

First, E1 demonstrated the game (“I’ll go first!”) in two trials. For each round of the game, Monkey hid the bead (“I’m going to hide the bead now!”) in one of the boxes (under the table) out of the child’s view and the boxes were placed back on top of the table. E1 then asked, “Monkey, which box has the bead?” and Monkey indicated one of the boxes by saying, “This one! The bead is in this one!” and touching the location. On the first round, E1 always followed Monkey’s advice and selected the box that Monkey pointed to. In this way, children observed what happens when a player (E1) followed Monkey’s advice. Monkey differed between conditions in both demonstrated accuracy and intentions, creating the four unique character profiles described previously: *Helpful*, *Silly*, *Tricky*, and *Wile*.

As the box that E1 picked was opened, E1 expressed either satisfaction (“Yay!”) or dismay (“Aww!”) at the outcome of their choice (the bead was either in the box or not) and Monkey also expressed a reaction (e.g., when the bead *was* found, *Helpful* and *Silly* respond with “Yay!” and *Tricky* and *Wile* responded with “Aww!”; when the bead *was not* found, *Helpful* and *Silly* responded with “Aww!” and *Tricky* and *Wile* responded with “Yay!”). This feedback was

designed to emphasize the conditions (e.g., Monkey varied in knowledge about the location of the bead and intention to help), and was the main manipulation between the conditions.

For example, *in the Helpful condition, the experimenters responded:*

E1: Yay! I found the bead! I listened to Monkey and now I will win stickers!

Monkey: Yay! I said the right one. I want to help and always say the right one on purpose.

In the Silly condition, the experimenters responded:

E1: What? The bead isn't in here? It's in this other box!

Monkey: Aww! I said the wrong one. I want to help but always say the wrong one by accident.

In the Tricky condition, the experimenters responded:

E1: What? The bead isn't in here? It's in this other box!

Monkey: Yay! I said the wrong one. I don't want to help and always say the wrong one on purpose.

In the Wile condition, the experimenters responded:

E1: Yay! I found the bead! I listened to Monkey and now I will win stickers!

Monkey: Aww! I said the right one. I don't want to help but always say the right one by accident.

Then, E1 continued by saying, "I'm going to try to get the bead again, but this time I'm going to see what happens when I *don't* listen to Monkey." In this way, children observed what

happened when a player (E1) did *not* follow Monkey's advice. The above process was repeated, but this time with the opposite outcome: in the two conditions in which E1 found the bead the first time (*Helpful* and *Wile*), E1 expressed disappointment at losing in the second round (E1: "Aww! I didn't find the bead! I didn't listen to Monkey and now I will not win stickers!"). In the two conditions in which E1 did not find the bead the first time (*Silly* and *Tricky*), E1 expressed satisfactions at winning in the second round (E1: "Yay! I found the bead! I didn't listen to Monkey and now I will win stickers!"). Monkey also responded in each case, consistent with each character profile:

For example, *in the Helpful condition, the experimenters responded:*

E1: Aww! I didn't find the bead! I didn't listen to Monkey and now I will not win stickers!

Monkey: Aww! I said the right one but you didn't find it.

In the Silly condition, the experimenters responded:

E1: Yay! I found the bead! I didn't listen to Monkey and now I will win stickers!

Monkey: Aww! I said the wrong one but you found it anyway.

In the Tricky condition, the experimenters responded:

E1: Yay! I found the bead! I didn't listen to Monkey and now I will win stickers!

Monkey: Aww! I said the wrong one but you found it anyway.

In the Wile condition, the experimenters responded:

EI: Aww! I didn't find the bead! I didn't listen to Monkey and now I will not win stickers!

Monkey: Yay! I said the right one but you didn't find it.

After the demonstrations, it was the child's turn to play the game.

Selective trust task. Next, the child was told it was now their turn to play the game.

After the training trials, the experimenter brought out an empty, round, wooden box and explained to the child:

EI: "When you find the beads they go in this box. Then you can trade the beads for stickers when you're done. Here's one to start with."

Beads were used as tokens to trade for stickers later (prior to the resource allocation task). In each individual trial of the selective trust task, the child either opened the correct box (bead will be inside) or the incorrect box (box will be empty). Each time the child chose correctly, the found beads were placed in the wooden box to be counted at the end.

To ensure all children had "earned" the same number of resources to be shared, the total number of beads found was always traded for exactly eight stickers. The experimenter gave the child a bead "to start with" so that each child always had at least one bead at the end of the task to trade for stickers, even if they found no beads during the game. The child was then told they would have an opportunity to share their stickers at the end with Monkey.

EI: "At the end, you can keep all the stickers for yourself, or if you want, you can give some stickers to Monkey."

In response to this, Monkey expressed a desire for the reward ("Stickers?! I love stickers!").

Next, it was the child's turn to play the game as demonstrated, and the two boxes and one bead were placed on the table in front of the child. For each trial, the experimenters state the following:

E1: "Are you ready to play?"

Monkey: "I'm going to hide the bead now!" [Hides bead in one of the boxes under the table, then places the boxes back on the table.]

E1: "Okay Monkey, which box has the bead?"

Monkey: [Points] "This one! The bead is in this one!"

E1: [To child] "Can you point to the box with the bead in it?"

The same yellow and green boxes used in training trials were placed in front of the child, and, after hiding the bead, the puppet provided advice about where the child should look for it. Monkey pointed to the correct or incorrect box and both experimenters gave verbal feedback, in correspondence to each of the four conditions. For all conditions, when the child found the bead, E1 always said,

E1: "Yay! You found it! Here is a bead to put in your box. You will trade it for stickers at the end!"

In cases that the child found the bead, Monkey responded:

In the Helpful condition,

Monkey: Yay! I said the right one and you found it.

In the Silly condition,

Monkey: Yay! I said the wrong one but you found it.

In the Tricky condition,

Monkey: Aww! I said the wrong one but you found it.

In the Wile condition,

Monkey: Aww! I said the right one and you found it.

This is when the found beads were placed in the wooden box. On the other hand, for all conditions when the child did not find the bead, nothing was placed in the wooden box and E1 always said,

E1: "Oh no! The bead isn't in this box. It's in this other box! Monkey!"

For each condition, the experimenters both continued to respond accordingly:

In the Helpful condition,

E1: "You told him/her the right one! It's okay – we will play again. Remember, Monkey wants to help and always says the right one.

Monkey: Aww! I said the right one but you didn't find it.

In the Silly condition,

E1: "You told him/her the wrong one! It's okay – we will play again. Remember, Monkey wants to help but always says the wrong one.

Monkey: Aww! I said the wrong one and you didn't find it.

In the Tricky condition,

EI: “You told him/her the wrong one! It’s okay – we will play again. Remember, Monkey does not want to help and always says the wrong one.

Monkey: Yay! I said the wrong one and you didn’t find it.

In the Wile condition,

EI: “You told him/her the right one! It’s okay – we will play again. Remember, Monkey does not want to help but always says the right one.

Monkey: Yay! I said the right one but you didn’t find it.

Children completed three trials of the *selective trust* task. Children were measured on how frequently they followed the puppet’s advice out of three trials. The box that the bead was placed in was counterbalanced.

Follow-up questions. After the children finished the selective trust task, they were asked six questions about the puppet to assess their understanding of each condition’s general traits, intentions, outcomes of each puppets’ advice, and a different-domain question about capability. In order to check their understanding of intentions behind the puppet’s actions, we asked: “Did Monkey want to help you find the sticker?” and “Is Monkey nice or mean?” Next, to measure children’s understanding of each condition’s outcome, they were asked: “Did Monkey say the right one?” and “Is Monkey a good person to listen to?” To assess children’s reasoning about the puppets’ general traits, they were asked: “If you played another game, would you want to play with Monkey or someone else?” Finally, to assess preschoolers’ reasoning about the informant’s general capabilities, we asked them: “Do you think Monkey can run fast or not run fast?” (as in Liu et al., 2013). Responses were recorded in terms of answers to the forced-choice questions.

Selective sharing task. After the selective trust task and follow-up questions, children were then asked to trade their beads in for stickers. The children had as few as one bead (never picked the correct box) or as many as four beads (always picked the correct box); in all cases, the experimenter said, "Let's see how many beads you found! Wow! That means you can have *eight* stickers!" The eight stickers were laid out in front of the child on the table, and then children were presented with the sharing task. The number eight was chosen based on previous resource allocation studies and to allow a wide range of variability in sharing behaviors because children were not expected to share more than half of their stickers with the social partner (Warneken & Tomasello, 2013).

Each child was given two novel boxes (one purple and one orange, to differentiate them from other containers used in the task), and children were told that one box is for Monkey and the other is for them. "Monkey's box" has a picture of a smiling monkey face and the child's box has a smiley face on top. These symbols were included to help children remember which box was theirs and which was Monkey's, to ensure they would not make errors in their placements. Children also answered a memory check question to ensure they understand this information ("Can you point to your box?" and "Can you point to Monkey's box?"). Next, children were instructed to place as many stickers as they wanted to keep into their personal box and as many stickers as they wanted to give to the puppet into the puppet's box:

E1: "All the stickers that you want to take home go in this box [point] and all the stickers that you want to share with Monkey go in this other box [point]."

Then, they were told that their decision was entirely private and up to them and a cardboard barrier was placed between the child and experimenter ("I'm going to put this up so no one can see!"). The privacy was used to allow the child confidentiality in their sharing decision,

so as to minimize the influence of socially desirable choices on the child's sharing decisions (Malit et al., 2016). If parents were present during the task, which was often the case, they were instructed to look away during this part of the task, so as not to influence children's decisions. Children were asked to alert the researcher when they were finished allocating the stickers. Researchers checked to make sure that no stickers were left on the table before continuing. (If there were leftover stickers, children were encouraged to continue the allocation process.)

Follow-up sharing question. After the child was finished making their decision, the boxes were placed aside, and the child was told that they could open their personal box shortly, after the entire game was over.

Children were asked a question about sharing, under the guise of E1 stating it was his/her turn to share. Pilot studies suggested that explicit questions about the *child's* direct sharing behaviors made the children uncomfortable, so this question was used as a more "neutral" measure of the children's evaluations of resource allocation. In each condition, E1 reminded the child how Monkey played the game.

In the Helpful condition,

E1: "Remember, Monkey wanted to help me, and he told me the right one, too."

In the Silly condition,

E1: "Remember, Monkey wanted to help me, but he told me the wrong one, too."

In the Tricky condition,

E1: "Remember, Monkey did not want to help me, and he told me the wrong one, too."

In the Wile condition,

E1: "Remember, Monkey did not want to help me, but he told me the right one, too."

Then, the child were asked, "Do you think I should share with Monkey?"

End of session. After the follow-up question, children's personal stickers were placed in a small, plastic bag to take home and they were thanked for their participation. The puppet's box was not opened in front of them, so as to avoid any unintended social consequences (e.g., children may feel embarrassment). Instead, the number of stickers in the box designated for Monkey was recorded after the child's departure, as the amount they chose to share with their social partner.

Results

Trust

Children's trust scores were calculated as the number of times they followed the source's advice (from zero to three) in the search task (for percentages, see Table 1).

To test the hypothesis that children would trust a source whose advice led to positive outcomes over negative outcomes (H_1), a 2 (Outcome: positive or negative) x 2 (Intention: positive or negative) factorial analysis of variance (ANOVA) was conducted. Assumptions for a factorial ANOVA were met. There were no significant effects of gender, birth order, parental education, ethnicity or time spent in preschool on children's trust. Therefore, these variables were not included in this analysis. There was a significant main effect of Outcome, $F(1, 164) = 164.88, p < .001, \omega^2 = .495$, indicating that children trusted a source whose advice led to positive outcomes more than those whose advice led to negative outcomes. There was not a significant main effect for Intention, $F(1, 164) = .03, p = .87, \omega^2 = -.002$, suggesting that children's trust did

not differ based on the sources' intentions. There was also no significant interaction between Outcome and Intention, $F(1, 164) = .64, p = .42, \omega^2 = -.001$. Overall, children trusted the sources with positive outcomes more than the sources with negative outcomes (see Figure 1). Hypothesis 1 was supported.

Sharing

Children's scores in the sharing task were measured as the number of stickers that children chose to share with the source, out of eight total stickers (although a priori, we did not expect children to share more than half of their earned resources, i.e., four stickers). Percentages of stickers shares in the Sharing Task are presented in Table 2.

To test the hypotheses that children would share more stickers with sources that had positive intentions compared to sources with negative intentions (H_2) and that there would be an interaction between intention and outcome in sharing behaviors across conditions (H_3), a 2 (Intention: positive or negative) x 2 (Outcome: positive or negative) factorial ANOVA was conducted. Assumptions for a factorial ANOVA were met and there were no significant effects of gender, birth order, parental education, ethnicity or time spent in preschool on children's sharing, so these factors were excluded from subsequent analyses. There was a significant main effect of Outcome, $F(1, 164) = 7.08, p = .009, \omega^2 = .03$, suggesting that children chose to share more resources with a source whose advice led to positive outcomes than sources whose advice led to negative outcomes. There was a significant main effect of Intention, $F(1, 164) = 13.59, p < .001, \omega^2 = .06$, indicating that children chose to share more resources with those who had good intentions over those who had bad intentions. There was no significant interaction between Outcome and Intention, $F(1, 164) = 3.02, p = .084, \omega^2 = .01$ (see Figure 2).

Post-hoc comparisons revealed that children did not share different numbers of stickers between the source who had positive intentions and positive outcomes ($M = 3.19$, $SD = 1.80$) and the source with positive intentions and negative outcomes ($M = 2.98$, $SD = 1.62$) ($t(82) = 0.56$, $p = 0.57$, $d = 0.12$), indicating children rewarded sources with positive intentions equally, regardless of Outcome. Furthermore, children shared similar numbers of stickers between the source who had positive intentions and positive outcomes and the source who had negative intentions and positive outcomes ($M = 2.71$, $SD = 1.52$) ($t(82) = 1.58$, $p = 0.21$, $d = 0.29$). This finding revealed that children chose to share equally with sources whose advice led to positive outcomes, regardless of Intention. However, children shared more stickers with the source with positive intentions and negative outcomes ($M = 2.98$, $SD = 1.62$) than the source with negative intentions and negative outcomes ($M = 1.57$, $SD = 1.67$) ($t(82) = 3.93$, $p = 0.0002$, $d = 0.86$), indicating that children chose to share more resources with a source who *accidentally* gave bad advice rather than a source who *purposely* gave bad advice. Hypothesis 2 was supported but Hypothesis 3 was not.

Follow-up Questions

Trust

Binary logistic regressions with Outcome (positive or negative), Intention (positive or negative) and their interaction (Outcome x Intention) as independent variables were used to analyze the children's responses to the verbal follow-up questions (e.g., yes or no, nice or mean) (for percentages, see Tables 3, 4, 5, and 6).

Context-specific intention question. To assess children's understanding of the sources' intentions, we asked them, "Did Monkey want to help you find the bead?" and recorded whether they answered "yes" or "no." Results showed a main effect of Outcome, Wald $\chi^2(1) = 14.45$, $p <$

.001, suggesting children were more likely to say that the source wanted to help them find the bead when the outcome was positive rather than negative. Results also indicated a main effect of Intention, Wald $\chi^2(1) = 21.73, p < .001$, signifying that children were more likely to say that the source wanted to help them find the bead when Intention was positive rather than negative. There was not an interaction between Outcome and Intention, Wald $\chi^2(1) = .75, p = .39$ (see Table 7). These results suggest that children reasoned that the source wanted to help them when he actually intended to help, as well as when he actually did help (even if the help was accidental).

Outcome question. To evaluate children's understanding of the sources' outcomes, we asked them, "Did Monkey say the right one?" and recorded whether they answered "yes" or "no." Results revealed a main effect of Outcome, Wald $\chi^2(1) = 34.14, p < .001$, suggesting that children were more likely to say that the source said the right one when the outcome was positive instead of negative. There was no main effect of Intention, Wald $\chi^2(1) = .10, p = .75$, showing that the likelihood that children would answer "yes" when asked if Monkey said the right one did not depend on whether the source had positive or negative intentions. There was not an interaction between Outcome and Intention, Wald $\chi^2(1) = 2.21, p = .14$ (see Table 7). These findings suggest that children can reason quite clearly about the outcome when they follow the source's testimony, and the source's intent does not appear to influence their understanding of a source's accuracy.

General attribution question. To assess children's reasoning about the sources' general attributions, we asked them, "Is Monkey a good person to listen to?" and recorded whether they answered "yes" or "no." Results showed that there was a main effect of Outcome, Wald $\chi^2(1) = 25.53, p < .001$, indicating that children were more likely to answer that the source was a good person to listen to when his advice led to positive outcomes instead of negative outcomes. There

was also a main effect of Intention, Wald $\chi^2(1) = 10.27, p = .001$, suggesting that children were more likely to respond that the source was a good person to listen to if he had positive intentions instead of negative intentions. There was not an interaction between Outcome and Intention, Wald $\chi^2(1) = .001, p = .97$ (see Table 7). These findings show that children reason that the source is a good person to listen to when the outcome is positive, as well as when the source's intentions are positive.

General intention question. To investigate children's reasoning about the sources' general niceness or meanness, they were asked the question, "Is Monkey nice or mean?" and their responses of "nice" or "mean" were recorded. There was a main effect of Outcome, Wald $\chi^2(1) = 11.69, p = .001$, indicating that children responded that sources were "nice" if their advice led to positive outcomes instead of negative outcomes. There was a main effect of Intention, Wald $\chi^2(1) = 6.12, p = .013$, revealing that children were more likely to answer "nice" when asked about the sources who had positive intentions compared to the sources who had negative intentions. There was not an interaction between Outcome and Intention, Wald $\chi^2(1) = .63, p = .33$ (see Table 7). These results suggest that children recognize when a source has positive intentions (and correctly identify the source as "nice"), and also attribute a source's positive outcome (despite the source's negative intentions) as being "nice".

General impression of ability. To assess children's impressions of the sources' general capabilities, we asked them, "Do you think Monkey can run fast or not run fast?" and recorded whether they answered "fast" or "not fast." There was a main effect of Outcome, Wald $\chi^2(1) = 3.56, p = .05$, indicating that children were more likely to respond that sources could run fast if the sources' advice led to positive outcomes instead of negative outcomes. There was no significant difference in children's answers between positive and negative Intention conditions,

Wald $\chi^2(1) = 1.61, p = .21$. There was not an interaction between Outcome and Intention, Wald $\chi^2(1) = .64, p = .57$ (see Table 7). These findings show that children reason that sources who are accurate (and therefore, the outcome of their advice is positive) have greater abilities in other domains (e.g., athletic ability) than sources whose advice is inaccurate (and their advice leads to a negative outcome). Children's answers did not indicate that intentionality was a factor in a source's general abilities; sources with positive intentions would not necessarily be able to run faster than those with negative intentions.

Preference question. To assess children's preference for playing with the source or another social partner, we asked them, "If you play another game, would you want to play with Monkey or someone else?" and recorded whether children answered "Monkey" or "someone else." There was a main effect of Outcome, Wald $\chi^2(1) = 8.97, p = .001$; children were more likely to respond that they wanted to play with the source again when the sources' advice led to a positive outcomes instead of negative outcomes. The likelihood that children would answer that they would play with "Monkey" was not significantly different for those in the positive and negative intention conditions, Wald $\chi^2(1) = .80, p = .37$. There was not an interaction between Outcome and Intention, Wald $\chi^2(1) = 1.24, p = .27$ (see Table 7). These results indicate that children preferred to play with the source again when the outcome of his advice is positive, but do not necessarily prefer to play with the source or someone else based on their good or bad intentions.

Sharing

General reasoning about sharing. To evaluate children's general attitude about sharing, Experimenter 1 asked them, "Do you think I should share with Monkey?" and recorded their "yes" or "no" responses. A binary logistic regression with Outcome (positive or negative),

Intention (positive or negative) and their interaction (Outcome x Intention) as independent variables was used to analyze the children's responses to verbal follow-up question about sharing (for percentages, see Table 8). Results revealed a main effect of Outcome, Wald $\chi^2(1) = 8.26, p = .004$, children were more likely to recommend that Experimenter 1 should share when the source's advice led to an outcome that was positive instead of negative. The likelihood that children would recommend that Experimenter 1 should share with the source was not significantly different for those in the positive and negative Intention conditions, Wald $\chi^2(1) = 2.73, p = .10$. There was not an interaction between Outcome and Intention, Wald $\chi^2(1) = .83, p = .36$ (see Table 9). These results indicate that children suggested that Experimenter 1 should share with the source when the outcome was positive, but do not necessarily think the Experimenter should share differentially between sources based on positive or negative intentions.

Discussion

In this study, we measured children's trust and sharing behaviors towards speakers who displayed different combinations of accuracy and prosociality, in order to measure children's assessments of sources across different social dimensions. Altogether, children trusted sources whose advice led to positive outcomes, and shared with sources who exhibited positive intentions *and* whose advice led to positive outcomes.

As expected, the current study revealed that children reliably trust an accurate speaker's advice, and ignore that advice when the speaker is inaccurate (regardless of the speaker's intentions). These findings replicate numerous studies, including preschoolers' tendency to trust accurate over inaccurate sources (for a review, see Mills, 2013). Similar to the current study, Liu et al. (2013) found that five- and six-year-olds gave greater weight to informants' advice when it

lead to positive outcomes, regardless of the informants' intentions. In addition, it is quite logical for children to trust others based on the outcomes of their advice in the particular paradigm used here—and similarly, even adults take outcomes into account when evaluating moral circumstances (Cushman, 2008). Cushman (2008) found that although adults considered others' mental states when judging appropriate punishment, the consequences of an act can also strongly influence those judgments. Another reason why children may rely solely on outcomes is because this information is potentially more salient. In this task, sources' advice that led to positive outcomes might be considered more salient, or explicit, information because the outcome of their physical actions is directly observable. Children may interpret the salient, obvious actions of the source as easier to understand compared to less obvious, underlying mental states.

In addition to the trust task, children were invited to share the resources they earned with the source who gave them advice about where to look. In this measure, we found that children chose to share a higher percentage of their prizes with the sources who had good intentions (and good outcomes). To our knowledge, no study to date has investigated children's sharing behaviors towards informants who provide correct or incorrect testimony across prosocial and antisocial domains, but there is evidence for selective sharing within the prosocial literature. For instance, children choose to allocate resources to social partners who are prosocial over antisocial (Kenward & Dahl, 2011), who had previously shared instead of refrained from sharing (Olson & Spelke, 2008; Warneken & Tomasello, 2013), and who had previously shared information instead of withholding information (Dunfield et al., 2013). As predicted, children in this study reasoned that sources should be rewarded for their positive intentions, and we found this to be true even if that source accidentally hindered them in the game. Interestingly, we expected children to share more with the source who exhibited both positive intentions and

positive outcomes compared to the source who exhibited positive intentions and negative outcomes; however, children shared equally between the two. These findings suggest that children may not be as strongly influenced by others' intentions when deciding who is *trustworthy*, but they do recognize good intentions when making other social judgments (such as *sharing*). In fact, children appeared to reason that the consequences of another's advice are not crucial factors when making moral judgments if a social partner intends to be helpful.

In addition to assessing children's sharing towards sources with positive intentions, we also investigated their sharing towards those with negative intentions. We found that children shared less with a source who intended to hinder them in the game (and was successful in doing so). However, interestingly, we found that children trusted and shared with a poorly-intended but accidentally accurate source. This unpredicted finding suggests that when the consequences of another's testimony result in positive outcomes, children conclude that this person deserves to be rewarded, even if he explicitly intended to harm. Curiously, children shared as many rewards with the accidentally helpful source, as the two positively-intended sources. It is possible that children are misattributing a source who gives accurate advice—rationalizing that someone who says the right answer might be a generally good social partner. Another possibility is that children are generally altruistic and want to reciprocate *any* positive behaviors that they benefit from; or perhaps their liberal altruism is a learned social norm. If this is the case, then children might be reasoning that any good quality (e.g., helpfulness, accuracy) is deserving of a reward, and they need very strong cues to break the social norm that you should share—essentially to punish an undeserving person.

We were surprised to find that children inferred sources with negative intentions were deserving of rewards when the source provided correct advice by mistake. Why would children

share with this source? It could be that children reason that someone's poor intentions are forgivable when the outcome is not actually harmful. In fact, studies on adults have demonstrated that it is difficult even in adulthood to reason about puzzling mental states and their consequences when making sense of others' intentions (Korman & Malle, 2016). Korman and Malle (2016) describe this difficult social reasoning as cognitively expensive, and adults "turn off" some mental processing in dynamic social interactions.

Children's answers to follow-up inference questions largely supported the idea that children assumed the *accidentally* helpful source was actually well-intentioned. To assess children's inferences about the source's intentions and gauge their opinion of the quality of the source, we asked children if the source "wanted to help," if the source was "nice or mean," and if the source was "a good person to listen to." Children correctly identified three out of the four sources. For instance, children offered positive answers (e.g., "nice," "wants to help," and "a good person to listen to") when making inferences about the two sources who had good intentions. And, children gave negative answers (e.g., "mean," "doesn't want to help," and "not a good person to listen to") when making inferences about the source who was both mean and successfully tricky. Children's responses to these questions are aligned with what we would expect their inferences to be for these conditions. However, children appeared to mischaracterize the fourth source, who was accidentally helpful, in their attributions. Instead of recognizing his harmful intentions, children appeared to focus on the unintended helpfulness of his actions, and inferred positive underlying characteristics—that he was "nice," "wanted to help," and "a good person to listen to." When we compare children's verbal responses to their sharing patterns, we can see that children's prosocial actions do, indeed, reflect their underlying social judgments. When children rewarded another's unintended positive outcomes, it appears this is because they

truly believed that the accidentally accurate source was prosocial. One reason for this could be that it is more difficult for preschoolers to make sense of this fourth character. In the real world, children may not regularly encounter social partners who overtly wish to harm but fail to be harmful, and thus have relatively little experience making sense of such combinations of behaviors and mental states. If this is the case, our data suggests that children default to placing more weight on the positive outcomes of the source's actions, rather than their unfulfilled harmful intentions.

Responses to other follow-up questions also reflect children's reasoning about the duality of others' behaviors and mental states—particularly the combination of intention and outcome information. To assess children's preference for continued interaction with the source, children were asked whether they preferred to play a subsequent game with the same source or someone else. Children preferred to continue to interact with those who had positive outcomes, regardless of their intentions. Logically, children appear to reason that an overtly correct partner is an optimal social partner.

Finally, to evaluate children's impressions of the source's general abilities, we asked children if they believed the source "could run fast." Answers to this question suggested that children thought sources whose advice led to positive outcomes would be more likely to "run fast" compared with those in the who did not. This finding is aligned with previous research, which documented that children judged sources to run fast based solely on outcome (Liu et al., 2013). Liu et al. (2013) found that five- and six-year-olds attributed this question about overt abilities (running) to other overt qualities (pointing to the correct box) but not to internal qualities (intention to help). Our sample also generalized positive outcomes to an ability to run

fast, using explicit cues (instead of less overtly obvious ones) in their reasoning about broad capability.

In addition to the questions following the trust task, we also asked children an inference question following the sharing task. To assess whether children thought that Experimenter 1 should share with the source, we reminded children that Experimenter 1 had also played the game under the same conditions and asked them if they thought Experimenter 1 should share stickers, too. We found that children's recommendations for Experimenter 1 to share with the source were aligned with outcome information, but not intentions. Interestingly, children's recommendations for another party to share were distinctive from their own sharing. Even though children shared with the source who had positive intentions, but was inaccurate, they did not reason that others should share with this source. One possibility is that children think that the accidentally inaccurate source only deserves rewards in a direct sharing situation within this context, but does not universally deserve rewards (in other, indirect circumstances). It may be easier to predict outcome information compared to intention information, and children may be more confident in recommending to share based on salient, obvious behaviors. Another possibility could be that this question is tapping into children's expectations of what the Experimenter *would* do, instead of what the Experimenter *should* do. For instance, DeJesus, Rhodes, and Kinzler (2014) documented children's divergence between expectations and evaluations of a third party's resource distribution. Although children responded that others should allocate resources equally in a moral task, they did not expect others to actually behave prosocially (DeJesus et al., 2014). Future research will be needed to further investigate children's expectations about others' social decisions in response to such sources.

There are several aspects to the questions presented here that remain to be examined. The current study was limited in the extent of the information that children were given about each source—only varying two dimensions, intentions and knowledge, while in reality social partners vary on a myriad of different characteristics. Future research might investigate how children trust and share with social partners whose traits vary along other, or additional, social dimensions. For example, several researchers have investigated children's selective trust in others who differ in expertise (Landrum, Mills, & Johnston, 2011), belong to an in-group or out-group (Kinzler, Corriveau, & Harris, 2011), or have reasons for their trustworthy or untrustworthy behaviors (Nurmsoo & Robinson, 2009a), but these dimensions have yet to be measured with selective sharing. Given that our findings reveal differences in children's prosocial behaviors towards others who have complex behaviors and mental states, it is possible that these measures will generalize to other social domains.

In addition to expanding research on children's assessment of others, another interesting topic to investigate is how children's resource allocations in this paradigm match up with other prosocial behaviors. For example, during the preschool years children are also beginning to exhibit behaviors such as helping and comforting, and it may be noteworthy to look into how children use such behaviors as unique social tools in more complex situations.

In closing, this study integrated two exciting areas of social cognitive development into a singular design for the first time. The question of how children selectively trust and selectively share with others based on their mental states is central to understanding how children develop the mechanisms needed to successfully interact with social partners. From the current study's findings, it is reasonable to imagine that children find distinct, and measurable, value in such characters as the kind neighbor who is a disastrous cook, or a malevolent classmate who happens

to know the right answer to a homework problem. This study hopes to provide support that children understand much more than singular dimensions of their relationships—they also are developing sophisticated social awareness designed to help them solve complex, real world problems.

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Table 1

Percentage of Children's Trust Scores (Out of Three Trials) Across Each Condition

Variables	Percentage of Trust Trials
Positive Intention- Positive Outcome	90%
Positive Intention- Negative Outcome	31%
Negative Intention- Negative Outcome	26%
Negative Intention- Positive Outcome	93%

Table 2

Percentages of the Numbers of Stickers Children Shared (Out of Eight) Across Each Condition

Variables	Percentage of Stickers Shared
Positive Intention- Positive Outcome	40%
Positive Intention- Negative Outcome	37%
Negative Intention- Negative Outcome	20%
Negative Intention- Positive Outcome	34%

Table 3

Percentage of Children's Dichotomous Answers to Follow-Up Trust Questions 1-3

Questions	Helpful		Silly		Tricky		Wiley	
	Y	N	Y	N	Y	N	Y	N
Did Monkey say the right one?	98%	2%	18%	82%	13%	87%	90%	10%
Did Monkey want to help you find the sticker?	95%	5%	88%	12%	33%	67%	84%	16%
Is Monkey a good person to listen to?	98%	2%	63%	37%	31%	69%	90%	10%

Table 4

Percentage of Children's Dichotomous Answers to Follow-Up Trust Question 4

Questions	Helpful		Silly		Tricky		Wiley	
	Nice	Mean	Nice	Mean	Nice	Mean	Nice	Mean
Is Monkey nice or mean?	95%	5%	75%	25%	56%	44%	92%	8%

Table 5

Percentage of Children's Dichotomous Answers to Follow-Up Trust Question 5

Questions	Helpful		Silly		Tricky		Wiley	
	Fast	Not Fast	Fast	Not Fast	Fast	Not Fast	Fast	Not Fast
Do you think Monkey can run fast or not run fast?	60%	40%	35%	65%	23%	77%	60%	40%

Table 6

Percentage of Children's Dichotomous Answers to Follow-Up Question 6

Questions	Helpful		Silly		Tricky		Wiley	
	Monkey	Someone Else	Monkey	Someone Else	Monkey	Someone Else	Monkey	Someone Else
If you play another game, would you want to play with Monkey or someone else?	55%	45%	35%	65%	33%	67%	63%	37%

Table 7

Binary Logistic Regressions for Each Follow-Up Trust Question

Variables	<i>B (SE)</i>	<i>Wald χ^2</i>	<i>p value</i>	<i>Odds Ratio</i>
<i>Q1: Did Monkey want to help you find the bead?</i>				
Outcome	-1.86(.49)	14.45	<.001	.16
Intention	-2.70(.58)	21.72	<.001	.07
Interaction	.86(.99)	.75	.39	2.37
<i>Q2: Did Monkey say the right one?</i>				
Outcome	-3.79(.65)	34.14	<.001	.02
Intention	-.21(.65)	.10	.75	1.23
Interaction	-1.92(1.29)	2.21	.14	.15
<i>Q3: Is Monkey a good person to listen to?</i>				
Outcome	-3.17(.63)	25.53	<.001	.04
Intention	-1.50(.47)	10.27	.001	.22
Interaction	.04(1.23)	.00	.97	1.04
<i>Q4: Is Monkey nice or mean?</i>				
Outcome	-3.62(1.06)	11.69	.001	.03
Intention	-1.20(.49)	6.12	.01	.30
Interaction	1.20(1.51)	.63	.43	3.33

Q5: *Do you think Monkey
can run fast or not run fast?*

Outcome	-.60(.32)	3.56	.05	.55
Intention	-.41(.32)	1.61	.21	.67
Interaction	-.36(.64)	.32	.57	.70

Q6: *If you could play another game, would you
want to play with Monkey or someone else?*

Outcome	-1.39(.46)	8.97	.003	.25
Intention	-.41(.45)	0.80	.37	.67
Interaction	.71(.64)	1.24	.27	2.04

Table 8

Percentage of Children's Dichotomous Answers to Follow-Up Sharing Question

Question	Helpful		Silly		Tricky		Wiley	
	Y	N	Y	N	Y	N	Y	N
Do you think I should share with Monkey?	98%	2%	18%	82%	13%	87%	90%	10%

Table 9

Binary Logistic Regression Analysis for Follow-Up Sharing Question

Variables	<i>B (SE)</i>	<i>Wald χ^2</i>	<i>p value</i>	<i>Odds Ratio</i>
<i>Question: Do you think I should share with Monkey?</i>				
Outcome	-1.41(.44)	10.05	.004	.17
Intention	-.81(.49)	2.73	.10	.44
Interaction	.81(.89)	.83	.36	2.26

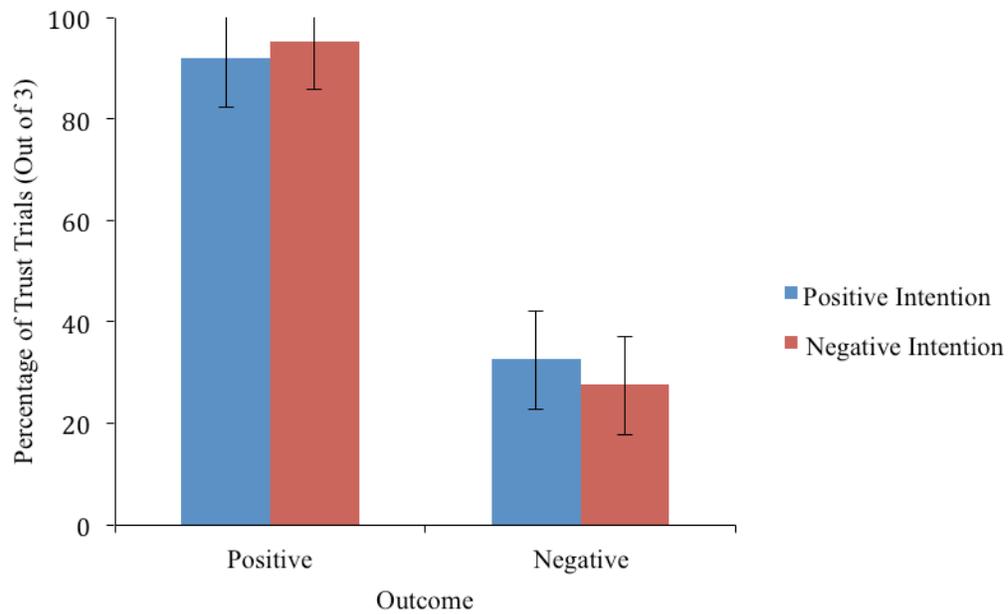


Figure 1. Percentage of trials (out of three) in which children trusted the source's advice in the search task. Error bars represent 95% confidence intervals.

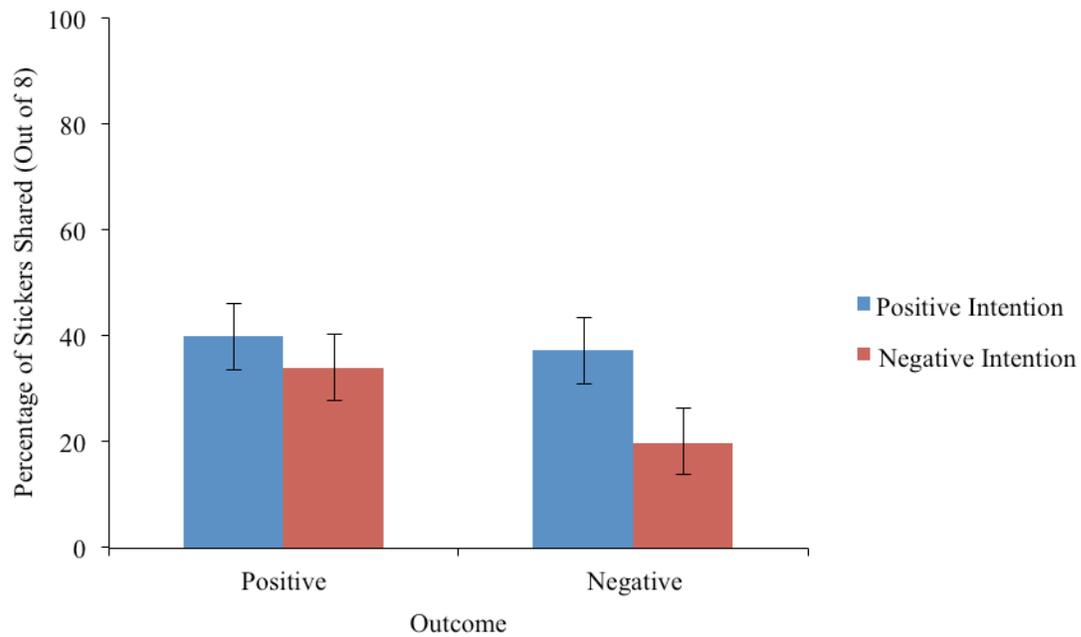


Figure 2. Percentage of stickers (out of eight) children shared with each source. Error bars represent 95% confidence intervals.