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Children's Selective Trust Based on Previous Lying Behaviors

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Children's Selective Trust

Based on Previous Lying Behaviors

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Biography

The author was born in Elmhurst, Illinois, on December 22, 1992. She graduated from York Community High School, in Elmhurst. She received her Bachelor of Arts degree in Psychology and her Bachelor of Science degree in Applied and Computational Mathematics and Statistics from the University of Notre Dame in 2015.

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Abstract

This study examined children's nuanced understanding of prosocial liars and self-serving liars across the following three areas: children's willingness to learn information from liars, their judgments of liars through their friend preferences, and their visual attention to liars. As children develop theory of mind skills, they learn they can manipulate other's knowledge states by telling lies. They also evaluate lying based on whether the liar has self-serving or prosocial intentions, with the former judged more negatively and the latter judged more positively. Based on research findings indicating that children demonstrate selective trust in informants based on their previous accuracy or reliability, the current study aimed to discern whether children (ages 4-11 years old) base their willingness to learn novel information on their evaluations of deceptive informants with sensitivity to the informants' intentions. Results suggest that as children age and increase in moral theory of mind, they increasingly trust information from a prosocial lying informant compared to a neutral informant, and appear to trust information from a self-serving lying informant marginally less than a neutral informant. Further, regardless of intentions of the lying informant, children tend to avoid choosing the lying informant as a friend. Some differences in visual attention are also discussed. Overall, this research indicates that children may have a more nuanced understanding of the intentions of deceptive informants that becomes more pronounced with age, yet children still prefer to have friends who do not lie.

Introduction

As children are learning to navigate their social worlds, they begin to tell lies in various situations, such as covering up transgressions or to receive rewards. This type of lying is referred to as *self-serving lying* and involves lying to protect oneself often at another person's expense. Typically, children are instructed by parents and other adults that lying is a bad behavior and they should avoid engaging in this behavior. Yet, parents encourage children to lie in politeness situations, such as when children receive an undesirable gift and are encouraged to tell the gift-giver that they indeed do like the gift. This type of lying is referred to as prosocial lying. *Prosocial lying* involves lying to dampen the emotional distress or harm that another may feel. Since children are told not to lie, this concept of lying for a prosocial reason may be confusing at a young age.

Of course, children also interact with people in their everyday environments who may lie to them or others. Given this, children need to develop the skills to differentiate between people who are reliable and unreliable sources of information to determine who they should trust. One possibility is that children perceive all people who lie as unreliable sources of information; if this is the case, then children should avoid trusting information from individuals who exhibit lie-telling behaviors. My master's thesis examined this possibility to determine whether and when children develop a differential understanding of different types of lying, specifically distinguishing between prosocial lying and self-serving lying.

Development of Theory of Mind

As lying becomes relevant in children's lives, theory of mind skills play an important role. *Theory of mind* refers to the ability to understand that others have a set of beliefs, desires, intentions, and knowledge states that may differ from one's own mental state. These skills begin to develop in early childhood and are utilized to explain others' actions. According to Bartsch and Wellman (1995), the development of theory of mind occurs in three phases, as discussed next.

Around two years of age, children use desires to explain others' actions and have little to no understanding about beliefs - this is referred to as the *desire* phase. Children at this age can talk about and understand that people do things to satisfy their individual desires, but they fail at belief reasoning tasks that three-year-old children pass with ease (Wellman & Woolley, 1990). For example, children can understand that their friend stole a cookie because that is what their friend desired, but they have more difficulty understanding that their friend stole a cookie because they desired it *and believed* the action they took would satisfy the desire. Around three years of age, children begin to have an understanding of beliefs, yet they do not use their knowledge of beliefs to explain the actions of others – this transitory phase is called the *desire-belief* phase. Past research has found evidence that three-year-old children have an understanding of beliefs and even *false beliefs*- having an understanding that others can be mistaken about the reality of a situation (Mitchell & Lacohee, 1991; Moses, 1993; Siegal & Beattie, 1991). Yet even with this knowledge, children in this phase of development still tend to explain others' actions in terms of desires, even when probed to refer to beliefs (Bartsch & Wellman, 1989).

It is not until around four years of age that children begin to use their understanding of beliefs and false beliefs to explain actions – referred to as the *belief-desire* phase. Four-year-old children begin to use beliefs more consistently to explain actions by attributing mental states, beliefs, and knowledge states to other people. Children of this age start to recognize that people engage in actions because they *believe* the actions will help achieve their desires regardless of the outcomes of those actions. Once children develop the theory of mind skills to this point, they are able to understand that others have a different knowledge set than their own and can use this information in a variety of ways, including engaging in lie-telling behaviors themselves as well as realizing that others could be lying. For example, once a four-year-old child realizes that his mother does not know he stole cookies from the cookie jar, he can use his understanding of her knowledge state (that she doesn't know who took the cookies) to engage in a self-serving lying behavior (e.g., by telling his mother "it wasn't me" when questioned).

Deception and lie-telling are relevant to moral understanding and evaluations, especially as children are able to make inferences about the beliefs of others and their intentions. For example, is the act of deceiving others always considered a bad behavior? Or do moral evaluations change based on children's understanding of a lie-teller's intentions? Researchers developed a task, called "The Accidental Transgressor" in order to measure children's morally relevant false belief theory of mind (Killen, Mulvey, Richardson, Jampol, & Woodward, 2011). In this task, children are read a story about a student who unknowingly throws out his or her classmate's cupcake in an attempt to help a teacher clean the

classroom, and are asked questions regarding the accidental transgressor's knowledge state and intentions. Results revealed that older children (7.5-year-olds) judged the intentions of the transgressor more positively than did younger children (3.5-year-olds). Further, when asked *why*, older children were more likely to justify their evaluations by mentioning that the transgressor did not have negative intent, indicating a more developed understanding of accidents and the intentions of others. Children's ability to understand the intentions of others in a morally relevant situation may indeed play a role in their ability to understand the intentionality of lie-tellers in prosocial and self-serving situations as well.

Summary

Young children tend to understand and explain actions only using desire psychology. By three years of age, they begin to understand beliefs and false beliefs, yet do not utilize this understanding in their explanations of others' actions. Around four years of age, children begin to systematically attribute mental states, beliefs, and knowledge states to others and use this information to explain their individual actions. Given this developing understanding of others' mental states, it is of interest to examine the ages at which children begin to engage in lying behavior themselves as this involves understanding that others do not have knowledge about the actual circumstances of an event. Further, it may be important to examine children's morally relevant theory of mind in relation to their understanding of prosocial and self-serving lies.

Development of Lying in Children

As theory of mind skills develop, children not only have the ability to understand someone has a different knowledge state than their own, but they also learn they can manipulate others' knowledge states through lying. Children then can use these skills in two main ways – telling self-serving lies to manipulate someone's mental state for selfish reasons or telling prosocial lies to do so for the emotional benefit of others, demonstrating social and emotional competence. Generally, children first begin to tell lies to cover up a transgression or to get a reward. Then, children begin to tell anti-social or self-serving lies for either their own gain or to avoid punishment (Talwar & Crossman, 2011). Typically, the development of lying behaviors is seen as a bad behavior that is worrisome to parents and caretakers.

Research examining children's development of these negative lying behaviors often utilizes a *temptation resistance paradigm*, in which children are asked not to peek at an object when an experimenter steps out of the testing room (Evans & Lee, 2013; Talwar & Lee, 2008). Upon return, the experimenter asks the children if they peeked at the toy. If the children lie, they are then asked what they believe the object to be and why. Results from these studies have indicated that children are able to tell lies around the age of three to four years old (Talwar & Lee, 2008); one study even suggested that children as young as two to three years old have the ability to do so and that this ability to tell lies correlates with children's levels of executive functioning on a Stroop task (Evans & Lee, 2013). As children reach five to six years of age, they demonstrate better lying skills, such as being able to maintain their lies. For example, when the children who

peeked in the above study (Talwar & Lee, 2008) are asked what they think is the object, younger children will respond naming the correct object, indicating that they in fact did lie about peeking, while children around five or six will maintain their lie by saying they don't know or giving the name of a different object. Further, seven- to eight-year-olds demonstrate the ability to tell more sophisticated lies (Talwar & Lee, 2008). After being probed for what the object is, children are asked *why* they think that is the object. Although five- and six-year-olds are able to maintain their lies, when asked *why* they tend to implicate themselves or give short responses for this question. On the other hand, seven- and eight-year-old children are able to give more elaborate responses and keep the lie going. Thus, as children age, they become more skilled at lying.

Most studies have focused on this negative type of lie-telling, but the development of lying behaviors actually demonstrates a normative developmental milestone, regardless of whether lie-telling behaviors are considered a desirable trait (Talwar & Crossman, 2011). Interestingly, the telling of prosocial lies tends to begin later in the developmental timeline than anti-social lies (Talwar & Crossman, 2011). A study conducted by Talwar, Murphy, and Lee (2007) aimed to examine children's development of prosocial lying behaviors using an *undesirable gift paradigm*, in which either a child or their parent is presented with an undesirable gift, such as a bar of soap, and then is asked by an experimenter whether they like the gift. In the case of the parent receiving the gift, the child is encouraged by the parent to lie on their behalf. Results from this study indicated that most children between the ages of three and eleven are willing and able to tell

prosocial lies. Moreover, the percentage of children telling these lies increases with age, and the older children told more elaborate prosocial lies.

In addition to engaging in lie-telling behaviors themselves, children have to recognize when others are lying to them. Lee and colleagues (1997) investigated the differences and similarities in children's evaluations of truth- and lie-telling situations by altering the intentions of the truth- or lie-teller. Children in this study were seven, nine, and eleven years old ($n = 120$ Chinese children, $n = 108$ Canadian children). Children heard four different scenarios that varied in whether the protagonist performed a prosocial or antisocial deed and either lied or told the truth about it to a teacher. Not surprisingly, children rated confessing to an antisocial deed positively, whereas lying about an antisocial deed was rated negatively. This result strengthened with age. In contrast, when the protagonist lied for a prosocial reason, seven-year-olds rated this negatively, whereas nine- and eleven-year-old children's ratings were either neutral or positive. This indicates that as children age, they begin to take intentionality into account when judging lie-telling behaviors, which may influence their willingness to learn from various lying informants.

Research studies have also examined children's understanding of a specific type of prosocial lie, called a "blue lie" (Fu et al., 2007; Fu et al., 2008). Blue lies are told to benefit a collective, sometimes at the expense of an individual, and thus serve a prosocial purpose. For example, when someone on a team sport knows they aren't very good, they may tell a blue lie by pretending to be sick during an important sporting event so that the team has a better chance of

winning. Fu and colleagues (2008) investigated children's evaluations of blue lies and the relation of these evaluations to their blue lie-telling behaviors in a two-part study; the study involved children ages seven, nine, and eleven years old from China. The first experiment ($N = 294$) explored children's lie-telling behaviors when put in a staged situation where they had to choose between lying for a collective of their peers (i.e., telling a prosocial blue lie) or telling the truth. As children increased in age, they were more likely to lie in the staged situation. The children also heard vignettes involving moral dilemmas where a child protagonist faced decisions about lying or telling the truth in situations where lying was more beneficial to the self or to the collective. Children were then asked whether the characters in the vignettes should lie or tell the truth. The researchers found as age increased, children were more inclined to lie for the collective (prosocial lying) and less inclined to lie for the self, and this was related to their own lying behaviors in the staged real-life situation. More specifically, all age groups were more likely to lie for the collective than the self, but seven-year-olds were close to chance, while nine- and eleven-year-olds were above chance for choosing the character to lie for the collective, further indicating that as children age they become more willing to engage in lie-telling behaviors if the lie is told with a prosocial intention.

The second experiment conducted by these authors ($N = 291$) delved further into children's moral judgments of blue lies. A similar methodology was used as Experiment 1 with the exception that the vignettes in this part involved the protagonist actually lying or telling the truth in the given scenarios instead of

just considering which option to do. Experimenters then asked the children to evaluate the lie- or truth-telling in the vignettes on a seven-point scale ranging from "very very bad" to "very very good." Consistent with Experiment 1, the findings from Experiment 2 indicated that as age increased, children rated lying for the self more negatively than lying for the prosocial purpose. Seven-year-old children evaluated lying for the collective negatively, while nine-year-old children evaluated this type of prosocial lying neutrally, and eleven-year-olds evaluated it positively, emphasizing a developmental trend that as children age they become more accepting of blue lie-telling. Importantly, these older children not only evaluated blue lies less negatively than the younger children, but they actually evaluated the prosocial blue lies positively, demonstrating a critical change in moral understanding.

Summary

As children grow older, they become more concerned with others as opposed to themselves in terms of their moral reasoning. Children also become more in tune to the intentions behind others' actions and more accepting of lying for prosocial reasons – they sometimes even prefer it. An open question is whether children can use their judgments of a person's intentions when engaging in a lie-telling behavior to evaluate whether that individual is a reliable source of information.

Children's Selective Trust in Informants

A growing body of research has examined how children's trust in the testimony of informants is influenced by the previous reliability of the informants

(e.g. Corriveau, Pickard, & Harris, 2010; Krogh-Jespersen & Echols, 2012). For example, Krogh-Jespersen and Echols (2012) proposed that children have a default trust in adult testimony that aids in learning novel information, but that indications of being an unreliable source of information can violate that trust. Their study examined two-year-old children's ($N = 160$) willingness to learn novel labels for familiar and novel objects from a single informant. Results indicated that when the object was novel and children had no other information to rely upon, they accepted labeling information from an unreliable informant. In contrast, when the object was familiar and children had a label for that object, they rejected the information provided by an unreliable informant. In both conditions, when the informant was a reliable source of information, two-year-old children were willing to learn the novel label for both novel and familiar objects. Thus, children are attending to the reliability of an informant when determining whether to accept novel label information.

Krogh-Jespersen and Echols (2012) utilized a single informant methodology adapted to the capabilities of younger children to decrease the memory demands for their task. Another paradigm for measuring children's willingness to learn novel information is a two-informant task, in which one informant is reliable and the other is unreliable. This task is appropriate for older children who have greater memory capabilities. Corriveau, Pickard, and Harris (2010) utilized this two-informant paradigm to examine four-year-old children's selective trust in information provided by either reliable or unreliable informants. Reliability in this study was presented to children as whether the informants

provided appropriate labels for a series of familiar objects: one informant always provided accurate labels (labeled a stuffed dog with the appropriate label "dog") and one with inaccurate labels (labeled a stuffed dog with a different familiar label, for example, "banana"). Following four familiarization trials, children participated in four trials of a novel object labeling task, in which each informant labeled a novel object with a different novel label (e.g., "This is a roke" vs. "This is a cham"). Children were asked to choose which label they believed applied to the novel object; thereby endorsing one of the informants. Results indicated that four-year-old children endorsed the information provided by the previously accurate informant. In a second part of this study, researchers replicated this finding with morphological forms of words. For the familiarization trials, one informant consistently used correct morphology (e.g., "Here are some shoes") while the other informant consistently used incorrect morphological forms (e.g., "Here are some shoe"). The test trials included novel morphological forms (e.g., "Yesterday he glang" vs "Yesterday he glung"). Using a two-informant paradigm allows researchers to evaluate whether children have a preference for learning novel information from a reliable informant in comparison to an unreliable informant.

A similar study conducted by Birch, Vauthier, and Bloom (2008) further demonstrated children's trust in testimony with a slightly different task and extended previous findings beyond word learning to object functions as well. In their study, three- to four-year-old children participated in a history phase in which two puppets each labeled four common objects. One puppet consistently

labeled all of the objects accurately, whereas the other puppet labeled all of the objects using a familiar but incorrect word. Next, children participated in a testing phase that consisted of a preference condition and a contrast condition. Each condition included the presentation of two pairs of novel objects. In the preference condition, both puppets applied the same label (e.g. a "ferber") to two different objects. Then, the experimenter asked children to hand them the "ferber." In the contrast condition, again both puppets applied the same label to two different objects, but in this condition the experimenter asked children to hand them an item that had a different object label. For example, the puppets each labeled different objects as a "koba" and the experimenter asked the child to hand them the "modi." In this condition, if children applied the novel label to the object that the accurate puppet endorsed, they should be more willing to hand the experimenter the other object (i.e., the object labeled by the inaccurate puppet). Consistent with predictions, results indicated that children chose the object labeled by the previously accurate puppet in the preference tasks and chose the object labeled by the previously inaccurate puppet in the contrast tasks.

Following the novel object label trials, children participated in a second reliability study examining their willingness to learn object functions from accurate vs. inaccurate informants. In this study, the familiarization phase involved one puppet applying correct object functions to familiar objects (e.g., the puppet says the object is for brushing your teeth when referring to a toothbrush), and one puppet applying incorrect object functions to the same familiar objects (e.g., the puppet says the toothbrush is for cleaning your face). The test trials were

similar to that of the first study, such that the two puppets applied the same object function to two different novel objects (e.g., they both stated that different novel objects are "for cleaning a toaster"). Then, the experimenter asked the child for the object that is used for cleaning a toaster. As in the first study, there were also contrast trials. The results indicated that children endorsed the accurate puppet's information in the preference condition for object functions but were at chance for the contrast condition. Although the effect for object functions was not as strong in the contrast condition as it was for object labels, the results from this series of studies demonstrate that children's selective trust in testimony is not exclusive to the word learning domain as there are similar patterns when learning about object functions.

Children may make judgments regarding selective trust based on factors other than reliability; in fact, recent research has examined whether young infants attend to group membership as a cue regarding which informant is providing the most accurate information. Buttelmann et al. (2013) examined 14-month-old infants' selective trust in informants based on in-group or out-group membership, with group membership determined by the language each informant spoke. This study examined object preference and imitation using the single-informant paradigm, which is suited for an infant population. First, participants watched a familiarization video featuring the informant telling a short story either in the participants' native language (in-group language condition) or an unfamiliar foreign language (out-group language condition). Following this video, infants participated in two imitation tasks that involved watching a video of the informant

performing an unusual action on an object (e.g., turning on a touch lamp with his/her head). The experimenter then gave the same object to the infant for 60 seconds and coded whether the infant performed the unusual action on the object at any point during the time-frame. The infants also participated in two preference trials that involved watching a video of the informant examining two objects and demonstrating a preference for one of the objects. The objects were then placed in front of the infant to determine which object the child preferred (e.g., which object the infant touched first). The findings indicated that infants in the in-group language condition were more likely to imitate the unusual action than those in the out-group condition. However, for the preference tasks, infants' choices did not differ from chance. Thus, at 14 months of age, selective learning from in-group informants was only evident for the imitation tasks.

Not only does group membership influence selective trust, but it also has been shown to influence children's social preferences. In a study conducted by Kinzler and colleagues (2009), researchers investigated the influence of foreign accents, foreign language, and race on five-year-old children's friendship choices. In Experiment 1 of the study, children viewed two faces on a screen and listened to voice clips for each of the photographs including American-accented English, French, and French-accented English. The experimenter then asked the children to select the child with whom they would want to be friends. Findings from Experiment 1 indicated that children demonstrated a preference for native language over foreign language as well as native accent over foreign accent when choosing friends. Experiment 2 utilized this same methodology to investigate

whether comprehensibility of the language influences children's friendship preferences. When asked which child they understood, children selected the child with the foreign accent over the child with the foreign language. But when asked with whom they would rather be friends, there was no significant difference between the child speaking in a foreign accent versus the child speaking in a foreign language, indicating that comprehensibility of a social partner is not necessarily a cue for social group membership. Experiment 3 of this study again utilized the same methodology to investigate whether children's social preferences are more so based on race or accent. Findings from this experiment indicated that when no audio information was available, children demonstrated a preference of the white child over the black child. Most of the children in this study were white, so this preference was expected due to previous research findings. Interestingly, when the photograph of the white child was paired with a foreign accent and the photograph of the black child was paired with a native accent, children demonstrated a friend preference for the black child with the native accent. Results from this study indicate that children's social preferences are more complex than simply visual information about another child when other information is available, such as language or accent.

Summary

Previous research has demonstrated infants' and children's selective trust in testimony across multiple domains, including novel word learning, object functions, and imitation, using a single informant and two-informant paradigms. Results from these studies support the proposal that children use information

about an informant, including his or her knowledge state and group membership, to determine whether that informant is a reliable source of new information or to choose friends. Yet, there are a number of open questions regarding the factors that children attend to when determining whom to trust when learning novel information.

Research Aims

This research study aimed to examine whether children make selective judgments regarding whether an informant is a reliable source of novel information depending on that informant's intentions when lying. Specifically, children's ability to differentiate between prosocial liars and self-serving liars was examined across the following three areas: children's willingness to learn novel information from liars, their friend preferences, and their visual attention to liars. This thesis also examined age-related differences as well as theory of mind differences in children's understanding of deceptive informants.

Statement of Hypotheses

The following hypotheses proposed developmental differences in selective trust across age, with younger children (4-6-year-olds) avoiding learning from liars regardless of intentionality, slightly older children (7-9-year-olds) showing a period of transition in their understanding of intentionality as it relates to deceptive behavior, and older children (10-11-year-olds) showing a preference to learn from a prosocial liar and an active avoidance to trust the self-serving liar. The hypotheses also proposed differences in friend preferences and visual attention across lying conditions.

Willingness to learn. Hypothesis I. As age and moral theory of mind scores increase, children will be more likely to trust information from the prosocial informant compared to the neutral informant.

Hypothesis II. As age and moral theory of mind scores increase, children will be less likely to trust information from the self-serving informant compared to the neutral informant.

Friend preference task. Hypothesis III. Children will more often choose to be friends with the prosocial informant compared to the neutral informant and this pattern will become more prominent with age.

Hypothesis IV. Children will less likely choose to be friends with the self-serving informant compared to the neutral informant and this pattern will become more prominent with age.

Visual attention. Hypothesis V. Children will attend differentially to faces in the prosocial lying condition than in the self-serving lying condition. This aspect of the current thesis was exploratory in nature as visual attention differences would not be predicted based on previous accounts of children's reliance on informants with varying levels of reliability. One possibility was that children will attend to the faces of the prosocial liar and the self-serving liar differently when compared to attention to the neutral informant.

Method

Participants

Participants included 130 children ($n = 76$ boys, $n = 54$ girls) between the ages of 4 and 11 years of age. In order to ensure variability in age, participants

were recruited according to membership in one of four age groups: 4-5-year-olds (n = 32, age range = 48-71 months, mean age = 60.19 months, n = 18 males), 6-7-year-olds (n = 32, age range = 72-95 months, mean age = 85.00 months, n = 17 males), 8-9-year-olds (n = 32, age range = 96-119 months, mean age = 107.38 months, n = 18 males), and 10-11-year-olds (n = 19, age range = 121-138 months, mean age = 127.68 months, n = 12 males). Participants' parents completed an optional demographic form for their child for which 52.31% did not respond to ethnicity and 50.77% did not respond to child's proficient languages, although all participants were fluent in English. Of the participants with responses, ethnicities were 62.90% Caucasian, 9.68% Hispanic, 9.68% mixed, 8.06% African-American, 4.84% Asian, and 4.84% other. Further, parents indicated whether children were only exposed to the English language or whether the children had been exposed to other languages; 73.44% of children were exposed to English only and 26.56% were exposed to at least one other language.

Fifteen participants were excluded from analysis due to having greater than 2 missing answers (n = 13) or due to technical problems with the eye-tracking computer (n = 2), for a total of 115 participants in the final dataset. All participants were recruited through the Museum of Science and Industry, Chicago and participated in this study in a designated space there. Participants received a small token of appreciation, such as stickers, erasers, or pencils upon completion of the study.

Materials and Procedure

The study used a 2 (Informant: liar, neutral) x 2 (Lying Type: prosocial, self-serving) mixed design with informant as a repeated-measures factor and lying type as a between subjects factor. Therefore, each participant experienced a liar and a neutral informant, with three types of Willingness to Learn trials - novel label, action imitation, and novel function – and a Friend Preference task. Some participants ($n = 54$) additionally completed a moral theory of mind task, which was added to the study design at a later timepoint.

Children were seated next to an experimenter in front of a 17.3-inch laptop equipped with a Tobii x3-120 mobile eye tracker. The experimenter explained to the participant that they would watch a series of videos of her friends. Two familiarization videos featuring the lying and the neutral informants were presented individually (described below). The order of presentation of the neutral and lying informants was pre-set and counterbalanced across participants such that half of participants saw the neutral informant first and half saw the lying informant first. Following the familiarization videos, the experimenter explained to the participant that they were going watch her friends name some items and that she would ask the participant a few questions. Children then participated in the following three tasks (described below) that were designed to examine their willingness to trust the testimony provided by the informants: the novel object label task, the action imitation task, and the novel object function task.

Following these tasks, for the children who did not participate in the Moral Theory of Mind task ($n = 61$), the experimenter then posed the Friend Preference task question (described below). For the children who further

completed the Moral Theory of Mind task ($n = 54$), the experimenter posed the Friend Preference task question, and then explained to the children that they would hear a short story and answer a few more questions. Upon completion of the study, the experimenter offered participants a prize from the prize box.

Familiarization videos. Participants each watched two videos designed to introduce them to the two informants appearing in the subsequent tasks: one video featured a neutral informant and the other featured an informant who lies. Both informants were female. The type of lie being told was a between-subjects factor, with children either viewing an informant engaging in a prosocial lie or a self-serving lie.

Prosocial lying. The prosocial lying familiarization video introduced children to the prosocial intentions that motivated one informant's lying behavior. The video started with a woman looking directly into the camera and saying she didn't like a toy that her friend gave her for her birthday. Then her friend was heard approaching off-camera, so the woman turned slightly to address her. The friend then asked if the woman liked her birthday gift. Even though she did not like the gift, she told her friend that she liked it anyway (see Appendix A for the verbal scripts for the familiarization trials).

Self-Serving lying. The self-serving lying familiarization video introduced children to the self-serving intentions that motivated one informant's lying behavior. The video started with a woman looking directly into the camera and saying that she accidentally broke her friend's toy. Then her friend was heard approaching off-camera, so the woman turned slightly to address her. The friend

then asked if the woman knew what happened to her broken toy. Even though the woman knew she broke the toy herself, she told her friend that the toy was already broken when she got there.

Neutral control. The neutral familiarization video introduced children to an informant who was not a liar. The video started with a woman looking directly into the camera and saying that she really liked a toy and wondered if her friend would like it too. Then her friend was heard approaching off-camera, so the woman turned slightly to address her. The friend then asked the woman if the item was her toy, to which she replied yes and that she thought it was pretty cool.

Selective Trust Tasks. After viewing the familiarization videos of one of the lying informants and a neutral informant, all participants engaged in three types of selective trust tasks: the novel object label task, the action imitation task, and the novel object function task. Each task consisted of two trials. Task order was pre-set, but the object labels, functions, and actions performed by the informants were counterbalanced.

Novel object label task. This task assessed children's willingness to learn a novel label from the informants across two trials. Each trial began with a video of each of the informants (i.e., one neutral and one liar) presenting a different novel label for the same novel object (e.g., "That's a gep" vs. "That's a dax"). Immediately after watching both videos, an image of the novel object appeared on the screen and the participant was prompted by the experimenter to endorse one of the two novel labels that the informants provided (e.g., "Would you call that a gep or a dax?") The child gave a verbal response. This procedure was repeated

with different novel labels ("That's a blicket" vs. "That's a dawnu") for a

different novel object on the second trial. Each child received a score across the

two trials, representing the proportion of trials in which the child endorsed the

novel label provided by the *lying* informant.
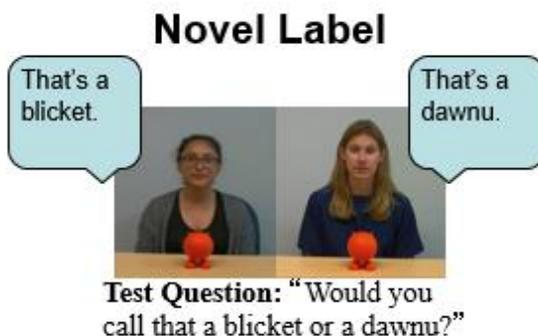
Figure 1. Novel object label task example.

Action imitation task. This task assessed participants' selective trust in the

informants' knowledge about how to perform novel actions. Participants viewed

two videos – one video of each informant performing an action on the same

object. In one trial, one informant turned on a toy with her elbow, whereas the

other informant turned on the same toy with her forehead. In a second trial, each

informant built the same set of blocks in a different way. Before producing the

action, each informant stated: "I [use the item] like this" (e.g., "I build the blocks

like this" or "I turn it on like this"). Immediately after watching both videos, the

experimenter asked, "Out of those two ways, how would you do it?" The child

was then presented with the object and given the opportunity to perform the

action of their choosing on it. Each child received a score across the two trials,

representing the proportion of trials in which the child imitated the action

performed by the *lying* informant.

Action Imitation

I build my blocks like this.

I build my blocks like this.

Test Question: "Out of those two ways, how would you build your blocks?"

Figure 2. Action imitation task example.

Novel object function task. This task measured children's selective trust in the informants' knowledge about how novel objects work. This task was similar to the novel object label task except instead of labeling objects, the informants described how they each use the same object (e.g., "That's for holding pencils" vs. "That's for working out"). Then an image of the object was presented on the screen and the experimenter prompted the participant, "Would you use this for working out or holding pencils?" This task also included a second trial in which a different object was used along with two different functions ("That's for picking up toys" vs. "That's for carrying a water bottle"). The child's verbal response was recorded. Similar to the above tasks, each child received a score across the two trials, representing the proportion of trials in which the child endorsed the function performed by the *lying* informant.
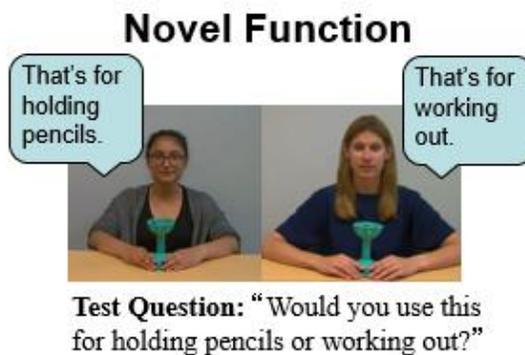
Novel Function

That's for holding pencils.

That's for working out.

Test Question: "Would you use this for holding pencils or working out?"

Figure 3. Novel object function task example.

Friend Preference Task. Following the three selective trust tasks, the experimenter prompted the child with one question, which was used to address children's social preferences. This question examined whether children encoded the intentionality information related to the liar in comparison to the neutral informant. Two images were presented side-by-side to the participant – one of the neutral informant and one of the lying informant. The experimenter then posed the question: "Who would you rather have as your friend?" Children were assigned one point if they pointed to the *lying* informant.

Moral Theory of Mind Task. Following the Friend Preference task (for children who participated in the study after the decision to add a theory of mind task; $n = 54$) the experimenter read each child a short story adapted from the Accidental Transgressor task (Killen et al., 2011), which was as follows:

"Emma (Ethan) and Sarah (Steven) are classmates. One day, Emma brings a cupcake to school and puts it in a paper bag because she wants to eat it after school. Then she goes out to play. Sarah comes in to help the teacher with cleaning the room and notices the bag left on the table. Sarah throws the bag in the trash."

The characters in the story were matched to the child's gender. The story was read aloud as the experimenter moved or pointed to paper images of the characters and items from the story (see Appendix B). Following the story, children were asked five questions for which participants received 1 point for each correct answer. Points were summed for each participant such that each

participant received a score between 0 and 5, with a score of 5 meaning all questions were answered correctly, demonstrating a higher level moral theory of mind. The questions along with examples of correct answers were as follows:

1) What did Sarah, the girl who threw out the bag, think was in the bag? (*trash*, *nothing*)

2) What was really in the bag? (*a cupcake*)

3) Where will Emma look for her cupcake when she comes back to the classroom? (*on the table, where she left it*)

4) Where is the cupcake really located? (*trash bin*)

5) When Sarah threw out the bag, did she think she was doing something that was "all right" or "not all right"? Why? (*all right*)

Apparatus

All of the familiarization videos, task videos and images, and the friend preference question images were displayed on a computer screen equipped with a Tobii eye-tracker. Thus, eye-tracking data were collected throughout the study using a mobile eye-tracker (Tobii x3-120). The data collected from the Tobii eye-tracker were analyzed in regards to Hypothesis V, addressing whether children's visual attention differs across conditions. For the purpose of this study, we focused on visual attention to the image of the informants displayed side-by-side during the Friend Preference task. Areas of Interest (AOIs) were generated for each of the informants' faces to determine whether attention to the informants differed by informant type (lying or neutral; see Figure 4 below).

Figure 4. Areas of Interest of same size and proportion created for informant faces.

Results

Willingness to Learn

Hypothesis I predicted that as children increase in age, they will be more likely to trust information from the prosocial lying informant compared to the neutral informant. For this analysis, age was measured in months, and willingness to trust the prosocial lying informant was measured in terms of the proportion of times a child endorsed the information from the lying informant out of the 6 total trials (or the number of trials completed by each participant for instances involving missing data for some of the trials). To test this hypothesis, a simple linear regression was conducted and found that age in months was a significant predictor of willingness to learn from the prosocial lying informant, such that as for every increase in one month of age, children's proportion of willingness to learn from the prosocial liar increased by 0.33 percent (meaning about a 3.96 percent increase per year of age) ($F(1,56) = 8.41$, $p = .005$), with an R^2 of 0.131

(see Figure 5 below). As part of Hypothesis I, I further wanted to examine whether an increase in moral theory of mind scores predicted an increase in children's willingness to learn from the prosocial lying informant. Another simple linear regression was conducted and found that for every increase in theory of mind score, children's proportion of willingness to learn from the prosocial liar increased by 11.75 percent, ($F(1,24) = 7.68$, $p = .01$), with an R^2 of 0.242. Thus, Hypothesis I was supported, in that both age and moral theory of mind were significant predictors of willingness to learn from the prosocial lying informant in the predicted direction.
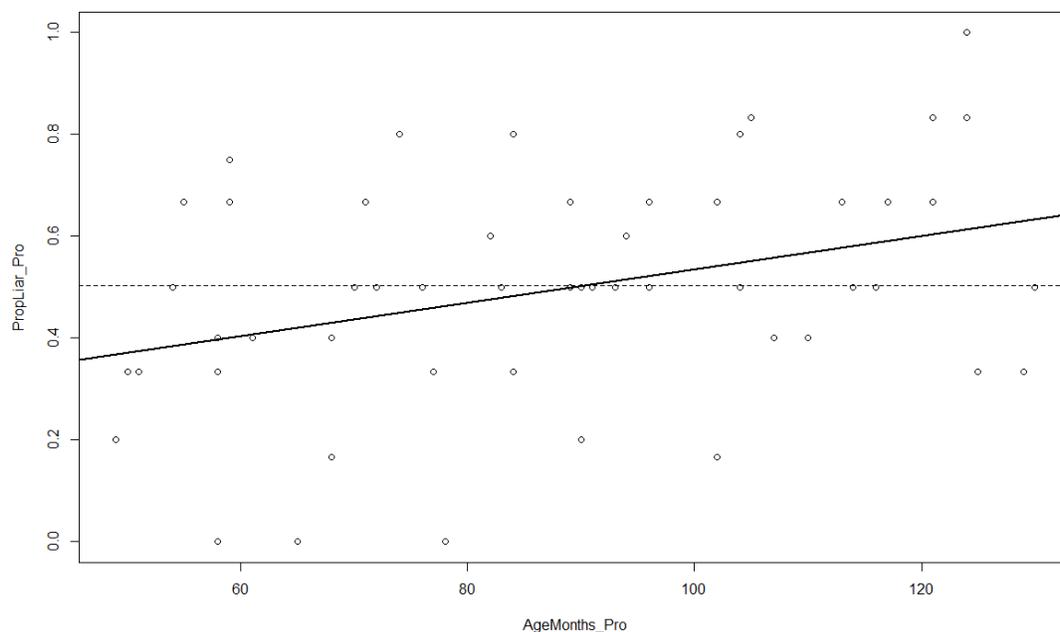

Figure 5. Simple linear regression with age in months predicting proportion of children willing to learn novel information from the *prosocial* lying informant.

Hypothesis II predicted that as children increase in age, they will be less likely to trust information from the self-serving lying informant compared to the neutral informant. For this analysis, age was measured in months, and willingness to trust the lying informant was measured in terms of the proportion of times a child endorsed the information from the self-serving lying informant out of the 6 total trials (or the number of trials completed by each participant for instances involving missing data for some of the trials). To test this hypothesis, a simple linear regression was conducted and found that age in months was not a significant predictor of willingness to learn from the self-serving lying informant, such that as for every increase in one month of age, children's proportion of willingness to learn from the liar decreased by 0.06 percent (meaning about a 0.7 percent decrease per year of age) ($F(1,55) = 0.29$, $p = .59$), with an R^2 of 0.005 (see Figure 6 below). This did not support our prediction, but was in the expected direction. As part of Hypothesis II, we also wanted to examine whether an increase in moral theory of mind scores predicted a decrease in children's willingness to learn from the self-serving lying informant. Another simple linear regression was conducted and found that for every increase in theory of mind score, children's proportion of willingness to learn from the self-serving liar decreased by 7.36 percent, ($F(1,26) = 3.99$, $p = .056$), with an R^2 of 0.133, indicating marginal significance. Thus, Hypothesis II was not supported with age as a predictor of willingness to learn from the self-serving lying informant, but was marginally supported for moral theory of mind as a predictor. Importantly, both age and moral theory of mind were in the predicted direction – older children

were systematically less willing to trust information from the self-serving liar than younger children.
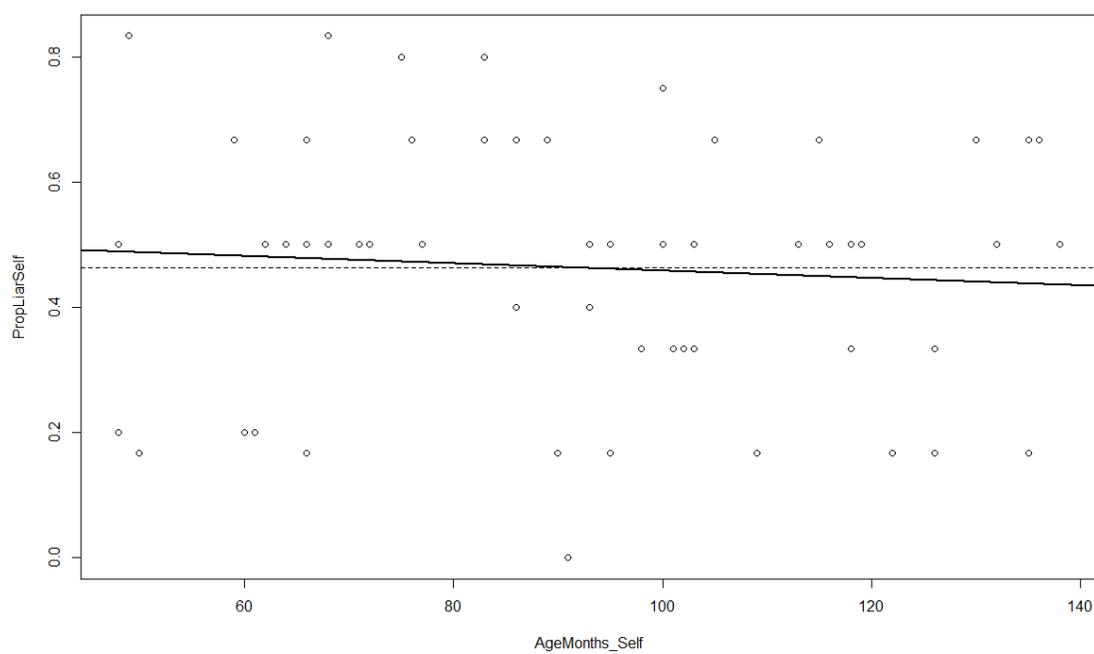
Figure 6. Simple linear regression with age in months predicting proportion of children willing to learn novel information from the *self-serving* lying informant.

Willingness to Learn by Task Type

Simple linear regressions were conducted to determine differences by task type for the three willingness to learn tasks – novel object label, action imitation, and novel object function – for each lying condition. For the Prosocial Condition, analyses show that willingness to learn from the liar in the *novel object label* task was significantly predicted by age and marginally significantly predicted by moral theory of mind score. Willingness to learn in the *action imitation* task was significantly predicted by moral theory of mind score, but not age. Finally,

willingness to learn in *the novel object function* task had no significant predictors.
See Tables 1 and 2 below; see Table 7 in Appendix C for a breakdown by age group.

	Novel Object Label			Action Imitation			Novel Object Function		
	b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Age (months)	0.0054	0.0019	.0056*	0.0024	0.0020	.2369	0.0015	0.0018	.4152
R^2		0.129			0.025			0.012	

Table 1. Willingness to learn (Prosocial Condition) by task type with age as a predictor.

*Significant at .05 level.

	Novel Object Label			Action Imitation			Novel Object Function		
	b	*SE*	*p*	*b*	*SE*	*P*	*B*	*SE*	*p*
Age (months)	0.1248	0.0675	.0766*	0.2209	0.0558	.0006**	0.0172	0.0721	.8140
R^2		0.125			0.395			0.002	

Table 2. Willingness to learn (Prosocial Condition) by task type with moral theory of mind as a predictor.

*Significant at .10 level.
**Significant at .05 level.

For the Self-Serving Condition, analyses show that willingness to learn from the liar in the *novel object label* task was only marginally significantly predicted by moral theory of mind score. No other significant relations were found. See Tables 3 and 4 below; see Table 8 in Appendix C for a breakdown by age group.

	Novel Object Label			Action Imitation			Novel Object Function		
	b	SE	p	b	SE	p	b	SE	p
Age (months)	-0.0020	0.0018	.267	-0.0007	0.0017	.6933	0.0005	0.0019	.783
R^2		0.022			0.003			0.001	

Table 3. Willingness to learn (Self-Serving Condition) by task type with age as a

predictor.

	Novel Object Label			Action Imitation			Novel Object Function		
	b	SE	p	b	SE	p	B	SE	p
Age (months)	-0.1101	0.0606	.0809*	-0.0376	0.0623	.5510	-0.0705	0.062	.266
R^2		0.129			0.014			0.047	

Table 4. Willingness to learn (Self-Serving Condition) by task type with moral

theory of mind as a predictor.

*Significant at .10 level.

Friend Preference

Hypothesis III predicted that children in the prosocial lying condition will

choose to be friends with the prosocial lying informant at greater than chance

levels (chance = 0.50). A one-sample t-test was conducted comparing the

proportion of children choosing the prosocial lying informant as a friend (M =

0.36) to chance. Although there was a significant difference at the 95% level,

$t(48) = -2.23$, $p = .031$, it was not in the predicted direction. Instead, children were

actually less likely to choose the prosocial lying informant compared to chance.

This did not support the hypothesis.

Hypothesis IV predicted that children in the self-serving lying condition

will choose to be friends with the self-serving lying informant at lower than

chance levels (chance = 0.50). A one-sample t-test was conducted comparing the

proportion of children choosing the lying informant as a friend ($M = 0.38$) to

chance. The difference was not significant at the 95% level, $t(52) = -1.82$, $p = .074$, however it was trending in the expected direction. Children were marginally less likely to choose the self-serving lying informant compared to chance.

Collapsing the results across conditions, children chose to be friends with the lying informant at a mean proportion of 0.36. This was significantly different from chance at the 95% significance level, $t(101) = -2.87$, $p = .005$. This indicates that overall, children tended to avoid being friends with a lying informant, regardless of the intention behind the lies.

Friend Preference by Age and Moral Theory of Mind

Logistic regression analyses were conducted to examine age as a predictor of children's friend preference of the liar compared to the neutral informant for each of the lying conditions. Results of both Wald's tests indicated that age was not a significant predictor of friend preference in the prosocial lying condition, $\chi^2(1) = 0.3$, $p = .58$, but was a marginally significant predictor of friend preference in the self-serving lying condition, $\chi^2(1) = 3.4$, $p = .065$ such that older children were less likely to prefer being friends with the self-serving lying informant (see Table 9 in Appendix C for a breakdown by age group).

Logistic regression analyses were also conducted to examine moral theory of mind as a predictor of children's friend preference for each of the lying conditions. However, results of both Wald's tests indicated that moral theory of mind was neither significant for the prosocial lying condition, $\chi^2(1) = 1.5$, $p = .22$, nor the self-serving lying condition, $\chi^2(1) = 0.21$, $p = .64$.

Visual Attention

Visual attention to the informants was analyzed in the side-by-side comparison of informants in the friend preference task for the purposes of this study. Mean proportions of total time spent attending to the lying and neutral informants' faces in relation to total time spent attending to the entire scene were compared across lying conditions, but no significant differences were found, indicating that both informants were attended to for a similar proportion of time. See Table 5 below for proportions of total time spent looking at the lying versus neutral informants in each of the lying conditions and the corresponding t-test analysis results.

Informant	Prosocial Condition	Self-Serving Condition	t	df	p
Lying	0.302	0.330	-1.06	103	.292
Neutral	0.309	0.319	-0.414	103	.680

Table 5. Mean proportions of total time spent looking at the lying versus neutral informants in the Friend Preference task and corresponding t-tests.

Given that both types of informants were attended to for similar durations of time across conditions, we next examined whether there were differences in participants' *first gaze* to the informants for the Friend Preference task, more specifically whether the gaze was directed to the lying informant or the neutral informant first. Again, no differences were found between lying conditions, although the means were in the predicted direction, with the proportion of participants who looked at the liar first in the self-serving condition ($M = 0.58$) being slightly but not significantly larger than the proportion of participants who looked at the liar first in the prosocial condition ($M = 0.51$), $t(103) = 0.69$, $p = .492$.

Finally, we examined whether first gaze on the Friend Preference task was related to children's Willingness to Learn preferences in order to determine whether children's attention was initially drawn to the liar or neutral informant in accordance with which informant they had been willing to learn from. Children were organized into three groups according to 1) whether they demonstrated a preference for the liar (meaning that they endorsed information from the lying informant in more Willingness to Learn trials than the neutral informant; e.g. the proportion of trials endorsing information from the lying informant was greater than 0.50 for each participant), 2) whether they demonstrated a preference for the neutral informant, or 3) whether they demonstrated equal preference (meaning children endorsed information from the liar and neutral informant equally in the Willingness to Learn trials). See Table 6 for proportion of first gazes to the lying informant's face, proportion of total time spent attending to each of the informants' faces in relation to total time spent attending to the scene for each of the three specified groups, and the corresponding ANOVA results.

Preferred to Learn From:	n	1st Gaze to Liar	Total Fixation Lying Informant	Total Fixation Neutral Informant
Lying Informant	38	0.42	0.32	0.31
Neutral Informant	37	0.51	0.31	0.34
Equal Preference	30	0.73	0.31	0.29
F (2,102)		3.524	0.019	1.86
p-value		.033*	.981	.161

Table 6. Proportion of first gaze to the liar, proportion of total fixation duration to the lying informant, (collapsed across intentionality conditions) and proportion of total fixation duration to the neutral informant by Willingness to Learn preference group type.

*Significant at .05 level.

Through further analysis of the first gaze to the liar by group type, we found a significant difference from chance that indicated when children had equal preference of informants in the Willingness to Learn trials, they tended to attend to the lying informant first (mean proportion = 0.73) when deciding which informant to choose as a friend, $t(29) = 2.841$, $p = .008$. The other two groups (those who had a preference for either the lying informant or the neutral informant) did not differ from chance in terms of whether their first gaze was directed to the lying or neutral informant, $t(37) = -0.973$, $p = .337$, and $t(36) = 0.162$, $p = .872$, respectively.

Discussion

The purpose of this thesis was to examine whether children have a nuanced understanding of lying depending on a lie-teller's intentions. Specifically examining whether, as children age and become more skilled in moral theory of mind, they develop a more sophisticated understanding of lie-telling behaviors, meaning they can distinguish that a person who engages in prosocial lying behavior may still be a good source of information, even though he or she provided inaccurate information in the past. Thus, an open question was whether children are able to consider the contexts for lie-telling behavior when determining whether to trust new information from an informant, when determining friend preferences, and whether this is reflected in children's visual attention.

Regarding children's willingness to trust new information from a lying informant, evidence supported these hypotheses in the predicted directions – that

as children increased in age and moral theory of mind, they were more willing to trust new information from a prosocial lying informant and less willing to trust new information from a self-serving lying informant compared to a neutral informant. This pattern demonstrates that children do judge these two types of lies differently and the pattern becomes more prominent in older children. This suggests that children do have a nuanced understanding of lying depending on whether the liar has prosocial or self-serving intentions. This is consistent with previous findings, that older children in this age group become more accepting of prosocial lying and less accepting of self-serving lying than their younger counterparts. However, the relationship was less strong for the self-serving lying condition and was only approaching significance with moral theory of mind as a predictor of trust, and no relation with age, inconsistent with other findings. This difference in results could be due to differences in methodology. The current study utilized a methodology where each child only saw one version of a lying scenario, while other research methodologies have involved each child evaluating multiple versions of each type of lying scenario and creating a composite score of their evaluations (e.g. Fu et al., 2007; Fu et al., 2008; Lee et al., 1997). Further, the current study had each child evaluate only one type of lying (prosocial *or* self-serving), while other research has had each child make evaluations on multiple lying types (e.g. blue lying vs. self-serving; Fu et al., 2007; Fu et al., 2008). Having each child evaluate multiple types of lying (prosocial and self-serving) may result in more defined differences in children's evaluations of each of these types compared to a decision to choose between each of these types of lying

informant and a neutral informant to trust information. On the other hand, it is also possible that children are more sensitive to prosocial lies than to the self-serving lies when deciding from whom to learn. A prosocial liar may have a halo effect, in which children view the informant as having generally positive traits, including a bias toward being helpful when providing information. It is less clear whether children determine that a self-serving liar is generally not helpful or, in this case, not knowledgeable.

It was also predicted that as children increase in age and moral theory of mind skills, they will be more likely to choose the prosocial lying informant as a friend and less likely to choose the self-serving lying informant as a friend in comparison to a neutral informant. Unexpectedly, this was only partially supported in that overall, regardless of lying condition, children tended to avoid being friends with any type of liar and preferred the neutral informant as a friend. The only age-related finding was that older children were less likely than younger children to prefer the liar in the self-serving condition. So interestingly, even though children became more trusting of the prosocial lying informant, they still generally preferred to have a friend who does not lie.

Additionally, there were differences in visual attention to the lying informants compared to the neutral informants in the Friend Preference task by Willingness to Learn preference group type. More specifically, children who had an equal preference for the lying and neutral informants in the Willingness to Learn trials tended to attend to the lying informant first. This could indicate that when children did not know who to trust in the Willingness to Learn trials, they

visually attended first to the lying informant to look for information when making the Friend Preference decision.

Thus overall, children do seem to use information regarding previous intentionality of an informant to make future decisions on whether to trust novel information from that individual, which is in line with research demonstrating that children and infants selectively trust informants based on previous information on the reliability and accuracy of the informants (Birch, Vauthier, & Bloom, 2008; Corriveau, Pickard, & Harris, 2010; Krogh-Jespersen & Echols, 2012). This pattern of results also seems to correspond with research findings on children's use of prosocial lying (Talwar, Murphy, & Lee, 2007) and evaluations of prosocial lies (Fu et al., 2007; Fu et al., 2008; Lee et al., 1997), which are rated more positively and used more often by older children. But our results indicate that this pattern may more so have to do with children's moral theory of mind than their explicit age. This makes sense given that those with higher levels of moral theory of mind are better able to understand others' mental state knowledge and thus have the skills to better judge others' intentions in nuanced situations, making moral theory of mind a better predictor of children's understanding of prosocial lying than merely the numerical value of age.

Limitations of Research & Future Directions

One limitation of the study was that the group of 10-11-year-olds had a smaller sample size than the other age groups due to adding that older age group to the research study at a later timepoint. Perhaps a stronger relationship would have been established between age or moral theory of mind and willingness to

learn with a larger number of older participants, especially since the pattern in the self-serving condition was not as strong as expected given the literature demonstrating children's increasing negative evaluations of self-serving lying as children age (Fu et al., 2008; Lee et al., 1997).

One potential future direction to help elucidate children's selective trust in informants based on intentionality should involve directly contrasting the two types of lying – prosocial and self-serving – instead of separately against a neutral informant. This could address the question of whether all lying is an equally bad, untrustworthy behavior or if children are more willing to trust a liar who has good intentions. Also, since the results of the Friend Preference task did not match our predictions, it might be important for future research to include a justification question regarding why children chose one informant to be their friend over the other in order to get a more in-depth understanding of the children's choices. Finally, since visual attention in this study was exploratory, future studies could examine differences in visual attention for other tasks besides the Friend Preference task.

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Appendix A. Familiarization Scripts

Prosocial Lying:

Close-up of informant talking to the audience with a toy placed in front of her.

Informant: "Ugh! I don't like this toy. My friend, Susan, gave it to me. I don't want her to know I hate it. Oh, here she comes."

Friend enters room off-screen. Informant turns slightly to face her.

Informant: "Hi, Susan."

Friend (Susan): "Hi. Do you like the birthday gift from me?"

Informant: "Yes, I do. It's my favorite toy, so thank you."

Self-Serving Lying:

Close-up of informant talking to the audience with a toy place in front of her.

Informant: "Oh no! I broke this toy. My friend, Amy, let me borrow it. I don't want her to know I broke it. Oh, here she comes."

Friend enters room off-screen. Informant turns slightly to face her.

Informant: "Hi, Amy."

Friend (Amy): "Hi. Do you know what happened to my toy?"

Informant: "No, I don't. It broke, but it wasn't me."

Appendix A Cont'd

Neutral Control:

Close-up of informant talking to the audience with a toy placed in front of her.

Informant: "Ooh! I like this toy. I just got it as a gift. I wonder if my friend, Claire, will like it too. Oh, here she comes."
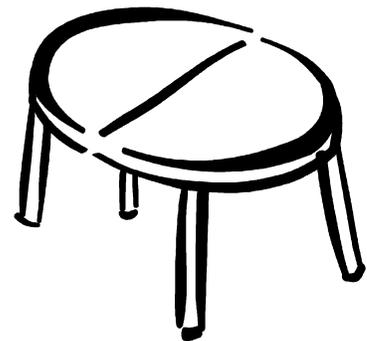
Friend enters room off-screen. Informant turns slightly to face her.

Informant: "Hi, Claire."

Friend (Claire): "Hi. Look at that; is that your toy?"

Informant: "Yes, it's mine. And I think it's pretty cool."

Appendix B. Morally Relevant Theory of Mind Images

Appendix C. Tasks Across Age Groups

Age	n	Novel Label	Action Imitation	Novel Function	Overall
4-5	16	0.34	0.47	0.41	0.39
6-7	16	0.44	0.56	0.44	0.49
8-9	16	0.53	0.56	0.53	0.55
10-11	10	0.75	0.70	0.45	0.63

Table 7. Willingness to Learn tasks by age group for the Prosocial Condition.

Age	n	Novel Label	Action Imitation	Novel Function	Overall
4-5	16	0.47	0.47	0.50	0.48
6-7	16	0.53	0.43	0.53	0.47
8-9	16	0.34	0.57	0.47	0.46
10-11	9	0.39	0.39	0.50	0.43

Table 8. Willingness to Learn tasks by age group for the Self-Serving Condition.

		Prosocial		Self-Serving
Age	n	Proportion Liar	n	Proportion Liar
4-5	16	0.27	14	0.64
6-7	16	0.36	14	0.29
8-9	16	0.43	16	0.31
10-11	10	0.33	9	0.22

Table 9. Friend Preference task by age group and lying condition.

		Prosocial		Self-Serving
Age	n	MoToM	n	MoToM
4-5	4	2.75	6	3.17
6-7	8	4.33	8	4.25
8-9	8	4.50	8	4.88
10-11	6	4.83	6	4.83

Table 10. Moral Theory of Mind task by age group and lying condition.