

PRESCHOOLERS THINK STRANGERS WILL SHARE THE SAME KNOWLEDGE AS  
OTHER GROUP MEMBERS, BUT WILL NOT BEHAVE LIKE THEM

A Thesis  
by  
MEGAN NORRIS

Submitted to the Graduate School  
at Appalachian State University  
in partial fulfillment of the requirements for the degree of  
MASTER OF ARTS

May 2018  
Department of Psychology

PRESCHOOLERS THINK STRANGERS WILL SHARE THE SAME KNOWLEDGE AS  
OTHER GROUP MEMBERS, BUT WILL NOT BEHAVE LIKE THEM

A Thesis  
by  
MEGAN NORRIS  
May 2018

APPROVED BY:

---

Robyn Kondrad  
Chairperson, Thesis Committee

---

Doris Bazzini  
Member, Thesis Committee

---

Amy Galloway  
Member, Thesis Committee

---

Rose Mary Webb  
Chairperson, Department of Psychology

---

Max C. Poole, Ph.D.  
Dean, Cratis D. Williams School of Graduate Studies

Copyright by Megan Norris 2018  
All Rights Reserved

## **Abstract**

### **PRESCHOOLERS THINK STRANGERS WILL SHARE THE SAME KNOWLEDGE AS OTHER GROUP MEMBERS, BUT WILL NOT BEHAVE LIKE THEM**

Megan Norris  
B.S., North Greenville University  
M.A., Appalachian State University

Chairperson: Dr. Robyn Kondrad

Children learn much of what they know from others' testimony. But, they are selective: children as young as 3 years consider cues to credibility like past accuracy, benevolence, and group membership to decide whom to trust. Research on credulity has centered on how children's judgments about a single individual influences their trust for that same person later. For instance, if children know that a particular informant has labeled objects incorrectly in the past, they are unlikely to later endorse that informant's testimony. The current study explores whether children generalize an epistemic behavior (i.e., being knowledgeable) and a social behavior (i.e., being nice) to members who are part of the same group but with whom children have had no direct experience. Four- and 5-year-olds learned that people who belong to one group (e.g., "red group") always either provide accurate information or are nice, and the other group always demonstrates the opposite behavior. Half the children heard the group being labeled and the other half did not. Next, children were introduced to two strangers; one wore a red shirt and the other wore a blue shirt. These strangers offered the same conflicting behaviors as their group earlier demonstrated.

Children's generalizations were conditional: they only generalized the epistemic trait when the stranger's group was explicitly labeled. They never generalized the social trait to strangers. These data suggest that children use group membership to make inferences about strangers' epistemic and social characteristics in different ways.

*Keywords:* selective trust, stereotypes, social categorization

## **Acknowledgements**

I would like to thank everyone who helped me in the completion of this thesis; I truly could not have done this without the help of so many people. Robyn, thank you so much for all the guidance you have given me the past two years. I honestly could not have completed this project without your assistance. I would also like to take this opportunity to thank you for sparking my interest in social cognitive development and I am excited for many future collaborations with you as both a researcher and friend. I would also like to thank my committee members, Dr. Doris Bazzini and Dr. Amy Galloway, for all your input and edits you have provided to make my thesis the best it can be. Thank you to the research assistants, Maggie, Taylor, Marissa, and Allison, in the DISC lab for your help in double coding my data and helping with recruitment. Additionally, I would like to thank the families in the community and the school directors who were so willing to allow me to work with their kids during data collection for this project.

I would like to thank my mom, dad, and sister for supporting me through this project. I would also like to thank the members of my cohort, especially Rebekah Knight, Blake Wagner, and April Young. Thank you for all the proofreading you have done, for talking out my results with me, and for continually checking on my mental health. I would not have been able to complete this project and still be sane without your help.

Lastly, I would like to thank the Office of Student Research, the family of the Wiley F. Smith, the SAFE fund, and the Graduate Student Association Senate of Appalachian State University for helping to fund this research as well as my travels to present my findings.

## Table of Contents

Abstract.....	iv
Acknowledgements .....	vi
List of Tables .....	ix
List of Figures .....	x
Abstract.....	2
Preschoolers Think Strangers will Share the Same Knowledge as Other Group Members, but will Not Behave Like Them.....	3
Social Categorization and Stereotyping.....	4
Labeling .....	9
Theory of Mind .....	12
Selective Trust.....	14
Current Study .....	17
Method.....	19
Participants.....	19
Design .....	19
Materials .....	20
Procedure .....	21
Hypotheses .....	25
Results .....	25
Familiarization Trials .....	26
Group Preference Trials.....	27
Generalization Trials .....	28
Exploratory Questions .....	28
Memory Check.....	30
Theory of Mind .....	31
Discussion.....	31
References.....	41

Tables .....	53
Figures .....	56
Appendix A.....	57
Appendix B.....	59
Vita .....	60



### **List of Tables**

Table 1. Stimuli and Labels for the Epistemic Condition.....	53
Table 2. Behaviors Used in the Social Condition.....	54
Table 3. Means and Standard Deviations by Trait and Identification Condition.....	55

## **List of Figures**

Figure 1. Means of Performance in Each Trial by Trait and Identification Condition .....	56
--	----

Preschoolers Think Strangers Will Share the Same Knowledge as Other Group Members, but

Will Not Behave Like Them

Megan Norris

Appalachian State University

## Abstract

Children learn much of what they know from others' testimony. But, they are selective: children as young as 3 years consider cues to credibility like past accuracy, benevolence, and group membership to decide whom to trust. Research on credulity has centered on how children's judgments about a single individual influences their trust for that same person later. For instance, if children know that a particular informant has labeled objects incorrectly in the past, they are unlikely to later endorse that informant's testimony. The current study explores whether children generalize an epistemic behavior (i.e., being knowledgeable) and a social behavior (i.e., being nice) to members who are part of the same group but with whom children have had no direct experience. Four- and 5-year-olds learned that people who belong to one group (e.g., "red group") always either provide accurate information or are nice, and the other group always demonstrates the opposite behavior. Half the children heard the group being labeled and the other half did not. Next, children were introduced to two strangers; one wore a red shirt and the other wore a blue shirt. These strangers offered the same conflicting behaviors as their group earlier demonstrated. Children's generalizations were conditional: they only generalized the epistemic trait when the stranger's group was explicitly labeled. They never generalized the social trait to strangers. These data suggest that children use group membership to make inferences about strangers' epistemic and social characteristics in different ways.

*Keywords:* selective trust, stereotypes, social categorization

Preschoolers Think Strangers will Share the Same Knowledge as Other Group Members, but  
will Not Behave Like Them

The extent to which children come to endorse and use stereotypes to guide their own beliefs and behavior has become a hot topic in developmental psychology, especially given the political climate surrounding gender, racial, and ethnic prejudice. For instance, a recent study found that by six years of age girls already endorsed the stereotype that males are smarter than females. Further, this belief led girls to be attracted to activities for “kids who try hard” and to avoid activities for “really, really smart kids” (Bian, Leslie, & Cimpian, 2017). Importantly, the researchers argue that ascribing to these beliefs dramatically alters girls’ experiences and contributes to gender normative career aspirations.

What is exciting about this relatively new wave of research is that scholars are moving beyond the question of whether children’s social attitudes give rise to early stereotypes that affect members of the stereotyped groups (they do; Aboud, 1988; Bar-Tal, 1996; Bigler & Liben, 2007; Katz, 1976), and moving towards questions such as how these early social categories and associated beliefs influence children’s own behavior and learning experiences. The current study contributes to the field by exploring three questions: Will preschoolers generate a stereotype of a group and use it to make predictions about the groups’ likely future behavior? Will those group stereotypes influence children’s selective preferences for strangers who are purportedly a part of that group, but with whom children have no direct experience? Will providing a label for the group (i.e., the red and blue people) and for the stranger (i.e., the red and blue persons) influence children’s generalization of group traits to strangers?

The following sections will provide more background on children's social categorization and stereotyping behaviors as well as how the selective trust paradigm can be used to explore how children's generalizations about individuals might influence their own learning behavior.

### **Social Categorization and Stereotyping**

Stereotypes are defined as a set of beliefs about the characteristics of members of a social category (Hilton & Von Hippel, 1996; McGarty, Yzerbyt, & Spears, 2002). One theory about how stereotypes are formed is that they are based initially on a categorization process (Allport, 1958; Tajfel, 1969). That is, people form an abstract representation of how individuals are alike in some important aspect (e.g., race, gender, animate vs. inanimate) and can thus be grouped together and treated as similar (e.g., Medin & Smith, 1981). Stereotypes are formed about the social category as people learn more about the associated characteristics (e.g., being told or having first-hand experiences that males, a social category, are characteristically intelligent). The associated characteristics are then applied generally to all members perceived as being part of the social category. This last part of the categorization process is called category induction: generalizing category characteristics to novel exemplars.

There are a number of theories about how particular characteristics become associated with a social category. For instance, the social learning approach suggests that people learn about stereotypes from their interactions with parents, friends, family, media, or other social outlets (e.g., Bigler, Jones, & Lobliner, 1997; Bigler & Liben, 2007; Eagly & Steffen, 1984; Greenwald & Banaji, 1995). As an example, first and second grade girls' math performance suffers when they have a female teacher who says that boys are better at math

(Beilock, Gunderson, Ramirez, & Levine, 2010). The cognitive developmental approach, pioneered by Piaget (1970) suggests that cognitive abilities focus attention on particular characteristics by which stereotypes are then formed. For example, young children may focus predominantly on perceptually salient characteristics (e.g., gender) whereas older children may also consider non-obvious properties (e.g., political affiliation) because they are better able to mentally represent both simultaneously. A full review of the many different approaches to stereotype formation is beyond the scope of this project (but see Hilton & Von Hippel, 1996; Meiser & Hewstone, 2004 for a review).

It is important to emphasize that categorization is a necessary and natural process that begins early in infancy (Kinzler & Spelke, 2011; Langlois et al. 1987; Mahajan & Wynn, 2012). Categorizing the people, events, objects, and so forth in the environment allows one to readily understand relationships between category members and make effortless inductive inferences about novel category members (Coley, Medin, & Atran, 1997; Gelman & Coley, 1990; Heyman & Gelman, 2000; Mareschal & Quinn, 2001). For instance, one reason why young infants are such phenomenal word learners is that they use perceptually obvious characteristics of an object, like the shape of their family dog, to categorize novel objects and generalize labels – seeing the neighbor’s dog for the first time and inducing by its shape that it also is a ‘dog’ with other dog-like characteristics (e.g., Baldwin, 1992; Imai, Gentner & Uchida, 1994). In other words, infants can learn the names for things at an astonishing rate because they can categorize like objects and make assumptions about what they are called, rather than having to learn the word for each object as a 1:1 ratio. Forming social categories, and subsequently forming stereotypes about those social categories is equally as necessary and important for learning about our social world as forming any other kind of category.

Without social categories, it would be difficult to explain and predict human behavior and one would be limited in his or her ability to navigate the social world.

Social essentialism is the predominant theory in developmental psychology that explains how young children form social categories in the first place. The essentialist approach suggests that there are inherent and often non-obvious qualities to living things and objects that make up the essence of categories that go beyond physical appearance (Gelman, 2003; Hirschfeld, 1996; Medin & Ortony, 1989). For example, Gelman and Coley (1990) asked 2.5 year-olds to look at typical and atypical category exemplars (e.g., a bluebird vs. a dodo bird) and decide whether certain qualities were true about each (e.g., does it live in a nest?). If children relied only on perceptual features, they should not expect a perceptually atypical category exemplar like a dodo to live in a nest, but they do. Further, by age five years, children treat natural categories (i.e., person, dog, female) as distinct from artifact categories (i.e., chair, book, tool; Rhodes & Gelman, 2009). Boundaries for artifact categories are seen as more flexible and subjective, whereas natural categories are seen as more objectively correct (Rhodes & Gelman, 2009).

There are two theories that describe how children form social categories that fit under the social essentialist approach. One of these theories has a focus on natural kinds and the other has a focus on social obligations. The theory that social categories are natural kinds proposes that the social world is composed of discrete kinds determined by nature which are stable, such as gender (Rothbart & Taylor, 1992; Rhodes, 2013). In a study conducted by Haslam, Rothschild, and Ernst (2000), adults rated social categories on different elements of essentialism. Researchers found that one of the dimensions that capture the structure of essentialist thinking follows closely with the theory of natural kinds. This dimension includes



perceptions of naturalness (natural vs. artificial), immutability (unchangeable), and historical stability (stable over time) suggesting that natural categories, such as race or gender, are unalterable, unlike categories like political affiliation or social class.

The theory that social categories are markers of social obligations suggests that social categories highlight relationships between people. This includes expectations that members of a category have inherent obligations to each other, therefore allowing for predictions of patterns of social interactions (Rhodes, 2013). For example, it is proposed that expectations are in place for a member of a category to befriend members of the same category and refrain from harming members of the same category. In a study conducted by Rhodes (2012), children 3- through 5-years old used novel social categories, even when they were arbitrarily defined, when making inferences about other children's behaviors. The participants were introduced to a group named the Flurps and another group named the Zazes. The researcher asked the child to predict the recipient of an action performed by an agent, "who did the Flurp steal a cookie from, another Flurp or a Zaz?" The children predicted that the Flurp stole a cookie from the Zaz, suggesting that 3 to 5 year olds believe agents would not harm their own group members (Rhodes, 2012). Children also expected agents from one category to harm members of another category (Rhodes, 2012).

Finally, a theoretical model developed by Bigler and Liben (2006; 2007) called the Developmental Intergroup Theory focuses on which specific characteristics of people become the basis of social categories rather than other characteristics. For instance, social categorizations are formed based on gender rather than height. This theory suggests that there are three processes that contribute to the formation of social categories and stereotypes: establishing the psychological salience of different attributes of the person (e.g. perceptual

discriminability), categorizing individuals by salient dimensions (e.g. classification into groups), and developing stereotypes and prejudices of salient social groups (e.g. implicit or explicit bias). Children first begin to develop stereotypes when people are explicitly labeled, treated, or sorted differently from each other. This then leads to the conceptualization of different social categories (Bigler & Liben, 2006; Bigler & Liben, 2007). Explicitly communicating stereotypic beliefs allows children to internalize those beliefs and then detect variations between groups and attributes that would have otherwise been overlooked (Bigler & Liben, 2006; Bigler & Liben, 2007). For example, when young girls enter school they may be classified into a group based on gender and even labeled often by that category label (“Good morning, boys and girls”; Bigler, 1995). This facilitates children’s conceptualization of this social category. Girls may then be treated differently from boys in areas of school achievement such as math skills which can also be communicated by the teacher either implicitly or explicitly (Beilock et al., 2010). Girls then begin to notice subtle differences between genders and internalize these beliefs that they are not as smart as boys (Bian et al., 2017). Girls internalizing these beliefs can cause them to seek other activities that are not as challenging, resulting in a possible long lasting effect on girls’ choices of occupation (Bian et al., 2017).

In summary, the categorization process begins early in life as a strategy for processing and quickly learning new information about the world. Of particular interest for the current study is the process of social categorization that gives rise to stereotypes in early childhood. In the current study, I investigated whether preschoolers use a perceptually salient cue (i.e., shirt color) as a marker for group membership, characterize that group with either an epistemic (i.e., knowledgeable) or social (i.e., nice) trait, and extend those traits to novel

category exemplars (i.e., to people who are either explicitly labeled as or perceptually appear to belong to a particular group).

### **Labeling**

Labels facilitate children's categorization processes (Bigler, Jones, & Lobliner, 1997; Cimpian & Markman, 2009; Gelman & Coley, 1990). For example, 16-month-old infants are more likely to generalize non-obvious properties of novel objects if the category to which it belonged was labeled (Keates & Graham, 2008). First, an experimenter introduced a target object and displayed its non-obvious property, (i.e. the sound it made), then labeled the object by saying, "Look, this is a blick." When the experimenter later used the same label for a test object, the infants expected the test object to make the same sound as the target object. But, if the experimenter did not label the test object, infants expected it to share the same property as something else that was a similar shape (Keates & Graham, 2008). Toddlers do the same thing: 2.5-year-olds make more accurate category inductions about animals when the animals are labeled, especially unusual animals like a Dodo bird (Gelman & Coley, 1990). For example, toddlers claimed that the dodo lives in a nest when the dodo was labeled as a bird, but did not expect it to live in a nest when it was not labeled.

Preschoolers also use labels to make inductive inferences about unusual category exemplars (Jaswal, 2004). Researchers showed 3-and 4-year-olds a picture of an animal that looked a lot like a cat, and told them that even though it might be hard to believe, it, "is actually a dog". When asked if the animal would drink milk like a cat or eat bones like a dog, the children made inferences about the animal that were consistent with the label (i.e., it will eat bones). These results suggest that preschoolers use labels to make inductive inferences even when they conflict with perceptual cues (Jaswal, 2004).

Labels guide preschoolers' social category inductions as well. For example, after learning about two children, one who was shy and the other who was friendly, a third child was introduced who looked like the friendly child but who was labeled as being shy. Preschoolers relied on trait labels rather than appearances when deciding which psychological quality was true about the third child (Heyman & Gelman, 2000). Using a similar paradigm, five-year-olds heard about two characters' social (i.e., religion) and personality (i.e., shyness) categories and what they each liked to play (e.g., a shy, religious boy who likes to play zigo vs. a friendly, secular boy who likes to play zaber; Diesendruck & HaLevi, 2006). When asked what a third child liked to play, who shared the same social category as one boy and the same personality category as the other boy, children relied more on matching the social category (e.g., saying the third child would like to play zigo), than they did the personality category. Importantly, children relied exclusively on the label; even when they had pictures, children's inductions were consistent with the label and not the perceptual cues (Diesendruck & HaLevi, studies 2 and 3).

Clearly, labels provide an efficient way for children to learn about the people and objects in their environment. They can direct more energy into learning new things, because they can make assumptions about the properties that novel objects and people might have given their labels. When labels are used in a generic way (e.g., boys are smart) rather than in a specific way (e.g., this boy is smart), the effect of the label is enhanced (e.g., Cimpian, Brandone, & Gelman, 2010; Cimpian & Markman, 2011). For example, in one study 4-year-olds learned about non-obvious properties of a novel creature. Some heard a plural or singular generic phrase (e.g., *Zarpies* are scared of ladybugs or *A Zarpie* is scared of ladybugs) and others heard a specific phrase (e.g., *This Zarpie* is scared of ladybugs). Those

children who heard generic phrases were more likely than those who heard specific phrases to associate innate characteristics with the Zarpies, extend properties of a single Zarpie to all Zarpies, and view being a Zarpie as a causal factor for having the non-obvious property (Rhodes, Leslie, & Tworek, 2012).

Generic language also increases stereotyping for perceptually obvious categories, such as biological sex (Bigler, 1995). In a field study, elementary school children between the ages of 6 and 11 years were assigned to one of three classrooms. In one classroom, the teacher used gender to assign children to groups, and highlighted the groups by using physical space (e.g., bulletin boards to display girls' vs. boys' artwork) and verbal instructions (e.g., "How many girls/boys know the answer?"). In a second classroom, color was used to assign groups (red vs. green) and the teachers used the same physical and verbal means to highlight those groups. In the third classroom, there were no groups. Teachers were instructed to treat the classroom as a single unit and to use specific language (e.g., "Does Tom/Tina know the answer?"). After 4 weeks, children in the gender classroom expressed more gender stereotypes relative to baseline measures when asked to rate certain activities as more feminine or masculine than either of the other two conditions. This research suggests that the use of generic labels increases stereotyping more than specific language, and as a result can influence the learning experiences children may have.

In summary, children begin to use labels at a very young age to make inferences about non-obvious qualities of novel objects (Gelman & Coley, 1990; Keates & Graham, 2008). Preschoolers use labels to make inductions about people's behaviors or preferences (Diesendruck & HaLevi, 2006; Heyman & Gelman, 2000). Using labels in a generic rather than a specific way may activate stereotypical beliefs about category members because it

implies normative behaviors or traits (Bigler, 1995; Cimpian et al., 2010, Cimpian & Scott, 2012, Hammond & Cimpian, 2017, Rhodes et al. 2012). In the current study, I ask whether labeling a group (e.g., “These are the red people.”) will increase the likelihood that preschoolers will generalize the groups’ epistemic or social traits to strangers.

### **Theory of Mind**

Preschoolers’ theory of mind ability may be related to inferences that children make about strangers based on strangers’ group membership. Theory of mind is the ability to mentalize: to understand others’ desires, beliefs, and intentions, how those mental states relate to behavior, and that mental states may differ from person to person (Wellman & Liu, 2004). Children’s mentalizing ability increases rapidly throughout their preschool years (Wellman & Liu, 2004). Some researchers suggest that theory of mind improves because of brain and cognitive development (see Mahy, Moses, & Pfeifer, 2014 for a review). As children’s brains mature, they have increased information processing, working memory, and other executive functioning abilities (Cuevas & Bell, 2014; Sabbagh, Xu, Carlson, Moses, & Lee, 2006). As a result, children are better able to set aside their own beliefs, desires, emotions, or knowledge in order to step into someone else’s mind.

Better theory of mind ability may make it less likely that children will generalize a characteristic they have come to know about some category members to novel ones. For example, a child may learn that teachers at their school generally like to eat apples. Children with better theory of mind abilities may be less likely than children with less developed abilities to expect a new teacher to also like apples. One of the skills that develops between the ages of 3 and 5 is the understanding that people have diverse desires that influence how they behave (Wellman & Liu, 2004). Children with better diverse-desire understanding may

realize that group membership may not be relevant for certain kinds of behaviors, like food preferences.

The negative correlation between perspective taking and stereotyping is seen in adults (Galinsky & Moskowitz, 2000). Undergraduate students created a narrative about an elderly man in a photograph. Participants were either asked to take the perspective of the man in the photograph or were not given any specific instructions. Later, participants in the perspective taking group expressed less stereotypic attitudes towards the elderly in their narratives and were generally more positive toward the target in the photograph than participants in the control condition. In other words, when asked to jump into the shoes of someone else, adults treat that person as an individual rather than as a generic older adult. As a result, people are less likely to make stereotypical assumptions about the individual when they take their perspective (Galinsky & Moskowitz, 2000).

A similar pattern emerges with preschool-aged children: those who are better at false belief theory of mind tasks are less likely to engage in stereotypical behaviors (Mulvey, Rizzo, & Killen, 2016). In the false belief theory of mind task, children have to understand that someone else may not have the same access to information as the child had, and may therefore have a false belief (Wellman & Liu, 2004). For example, a child may be given information about an item that is unexpectedly inside a box (i.e. a button inside a bandage box) but another person is not given this information; for a child to display false belief theory of mind, they must be able to infer that that other person would think that the expected item – bandages – would be inside the box, rather than the unexpected button.

One study found that 3- to 6-year-olds who passed false belief tasks were more likely to challenge gender norms than those who failed (Mulvey et al., 2016). Children were told

stories about a member of a group who wanted to play with a gender-atypical toy. Then, children answered questions about their expectations of the likelihood of the target of the story to resist gender stereotypes such as, “Do you think he will tell the group that he wants to play with tea sets? What would you tell the group?” Those children who passed false belief expected peers to challenge group norms relating to gender stereotypes and were more likely to propose playing a gender-neutral game than children who failed false belief (Mulvey et al., 2016).

The current study explores whether theory of mind is correlated with children’s generalization of group traits to strangers. If children are better at perspective taking they may be less likely to generalize to strangers because they think of the stranger as an individual with unique beliefs and desires. Children may be willing to extend group traits, but only if they have direct experience with the stranger.

### **Selective Trust**

Selective trust tasks have been used to explore how preschool-aged children make decisions about whether to believe others’ testimony (e.g., Jaswal & Neely, 2006; Koenig & Harris, 2005). In the classic paradigm, children hear two speakers offer conflicting testimony about familiar objects. One speaker always labels one object correctly and the other always labels it incorrectly. Later, children hear the same two speakers offer conflicting novel labels for several novel objects and have to decide which of the two speakers to believe. The idea is that children will form a representation about the two speakers (i.e., one is always right and the other always wrong) and they will later use those representations to guide their learning by selectively believing novel information provided by the reliable speaker and ignoring the unreliable one (Koenig, Clement, & Harris, 2004).



There is a plethora of research that shows preschoolers are sensitive to many epistemic cues that indicate credibility. They selectively prefer learning new information from informants who have been accurate in the past (e.g., Jaswal & Neely, 2006; Koenig & Harris, 2005), confident (e.g., Tenney, Small, Kondrad, Jaswal, & Spellman, 2011), or who are known experts (e.g., Boseovski & Thurman, 2014; VanderBorghet & Jaswal, 2009). Children also use social cues when deciding whether someone is trustworthy. Using the selective trust paradigm, for instance, children generated representations of one informant as benevolent and another as mean. Later, children preferred learning novel information from the benevolent individual (Johnston, Mills, & Landrum, 2015; Landrum, Pflaum, & Mills, 2015).

Group membership is a particularly powerful social cue for trust. For example, children endorse information from an individual who earlier had been a member of a consensus over one who was a dissenter (Corriveau, Fusaro & Harris, 2009). In fact, even when children know that the consensus has provided inaccurate information they will often defer (Chen, Corriveau, & Harris, 2012; Corriveau & Harris, 2010). The authors have argued that it is advantageous for children to be perceived as likeable by the majority group and so children provide “respectful deference” even when they do not truly believe the testimony (see also Jaswal & Kondrad, 2016). The power of group membership intensifies when children perceive themselves to be part of a particular group. For instance, children saw one informant who had a native-accent and another informant who had a non-native accent demonstrate the functions of several objects. Later, children were more likely to agree with the way the native-accented speaker used the object (Kinzler, Corriveau, & Harris, 2011). Similarly, children who were assigned to be part of a group defined by shirt colors later,

using the selective trust paradigm, showed preferences for in-group testimony even though out-group members were just as knowledgeable (MacDonald, Schug, Chase & Barth, 2013).

Clearly, children make epistemic generalizations and decisions based on epistemic or social cues (i.e., knowledgeable and benevolent people will know more, so I will endorse their testimony). But, they also make social generalizations and decisions based on social cues (i.e., people nice in the past are going to be nice later, so I will befriend them). For example, using a modified selective trust paradigm, preschoolers indicated that they would rather be friends with native than non-native accented speakers (Kinzler, Shutts, DeJesus & Spelke, 2009; Kinzler, Shutts & Spelke, 2012). When faced with native- and non-native accented speakers who were mean, children's dislike was greater for out-group than in-group members (Kinzler & DeJesus, 2013).

In summary, there is no doubt that children are sensitive to epistemic and social cues to credibility and that guide their learning and social preferences. But nearly all of the research in this area has focused on how the representation children build about a given individual later influences their predictions about that same individual's future behavior and subsequent selective trust. What is less clear is whether children generalize group characteristics to individuals who are purportedly a part of that group, but with whom children have no direct experience, and if they do, whether that generalization will influence their selective epistemic or social preferences towards those unfamiliar individuals. The current study is the first to take advantage of this paradigm to investigate how children generalize social and epistemic characteristics to novel category members, and whether those generalizations lead to preferences when it comes to learning new information. This is the first study to use the selective trust paradigm to specifically explore how children might use

generated stereotypes to guide their learning about novel objects and novel behaviors from strangers. The selective trust paradigm provides a well-validated approach to addressing these questions.

### **Current Study**

The current study addresses these questions using a modified selective trust paradigm. First, 4- and 5-year-olds were introduced to two groups identified by shirt color. In one condition, the groups displayed a positive or negative epistemic behavior (knowledgeable or not). In another condition, the groups demonstrated a positive or negative social behavior (nice or not). Children then heard the groups offer conflicting novel words for novel objects in the epistemic condition, or display conflicting novel behaviors on novel objects in the social condition, and were then invited to endorse the novel label or novel behavior of their choice. I anticipated that children would prefer the group demonstrating the desirable characteristic. Next, children were introduced to two strangers wearing either a red or blue shirt who had never had contact with the groups.

The primary question of interest was whether children would generalize their earlier stereotypes about the groups (i.e., this is a nice group) to these strangers, even though they have never observed information about the strangers epistemic or social characteristics. In addition, half of the children heard the group and stranger explicitly labeled by their group status (red/blue) whereas the other half heard the groups and strangers referred to generically (these people/this person). This secondary question explored whether labels would facilitate children's stereotypes and influence their selective trust more than if category membership remained ambiguous. Finally, children completed a series of Theory of Mind tasks in order to assess individual differences in perspective taking ability. Of interest was whether a child's

ability to understand the mindset of a stranger perceived to be a member of a group would lead to subsequent refraining from stereotyping the appropriate epistemic and social traits to the stranger.

There are two unique features of the current study that are important to note. First, children who participated were not part of either group being introduced to them. In most of the previous research on intergroup processes, children have been members of one of the groups and the studies addressed how being a part of an in- or out-group influenced children's behavior. In the current study, I am specifically interested in exploring how children might use social categories to guide their expectations about groups and strangers when they are *not* members themselves of any of the groups involved.

This age group was selected because of several developmental shifts that occur around the 4- and 5-year-old age range. First, children are better able to keep track of credibility cues like a history of accuracy and inaccuracy when they are four years old; younger children only track inaccuracy whereas older children track both (Corriveau, Meints, & Harris, 2009). Older children may be better at keeping track of multiple cues in part because their executive functioning abilities, especially inhibitory control and working memory, improve from 3- to 5-years of age (Belsky, 2013; Zelazo, Carlson, & Kezek, 2008). As noted above, there are also dramatic changes in theory of mind ability taking place during this age range that could have consequences for stereotyping behaviors (Wellman & Liu, 2004). Finally, this age range represents a time when children may be on the cusp of sensitivity to stereotypes impacting their own behaviors. Some research has found that it is not until six years of age that children have clear expectations about some types of

stereotypes, like gender norms (Bian et al., 2017). Therefore, children younger than six may be less sensitive to stereotypes and are not yet using them to to guide their experiences.

I expected children who are learning about information would have a stronger preference for the groups and strangers with the desirable trait than children who are learning about behaviors. I expected selective preferences would be stronger for the group members than the strangers. I also expected older children and children who heard social category labels would display stronger preferences for the stranger. Additionally, I expected greater performance on the theory of mind tasks and would negatively influence performance on the generalization trials.

## Method

### Participants

One-hundred-six children participated in a single 15-minute session. Due to failure to pass catch trials and experimenter error, 14 children were excluded from the sample. This rate of exclusion is typical for this age range (e.g., Jaswal, Mckercher, & VanderBorgh, 2008; Palmquist, Jaswal, & Rutherford, 2016). The final sample included 92 children with 44 four-year-olds ( $M_{\text{age}} = 55.14$  months,  $SD = 3.16$ ; 24 girls) and 48 five-year-olds ( $M_{\text{age}} = 66.13$  months,  $SD = 2.97$ ; 24 girls). Children were recruited from a database of families from the community and local preschools and came from predominately white, middle class backgrounds. Participants were treated according to the guidelines set forth by the American Psychological Association, see Appendix B for IRB approval documentation.

### Design

Children participated in one of four conditions: Epistemic Labeled ( $n = 23$ ; ages 50 months – 71 months;  $M_{\text{age}} = 60.96$  months,  $SD = 5.99$ ), Social Labeled ( $n = 24$ ; ages 48

months– 70 months;  $M_{\text{age}} = 61$  months,  $SD = 6.96$ ), Epistemic Not-Labeled ( $n = 22$ ; ages 51 months – 69 months;  $M_{\text{age}} = 60.68$  months,  $SD = 5.30$ ), and Social Not-Labeled ( $n = 23$ ; ages 50 months – 72 months;  $M_{\text{age}} = 60.83$  months,  $SD = 7.14$ )<sup>1</sup>. Approximately equal numbers of 4- and 5-year-olds participated in each condition. In each of the four conditions, children completed four trial blocks: (a) four familiarization trials, (b) four group preference trials, (c) four generalization trials, and (d) two catch trials. Following the catch trials, children were asked three exploratory questions, completed a series of theory of mind tasks (see Appendix A), and completed a memory check at the conclusion of the study.

### **Materials**

Twelve familiar objects were used for the familiarization and catch trials, and 16 novel objects were used in the group preference and generalization trials for the Epistemic condition (see Table 1 for a list of familiar and novel objects). High quality photographs were taken of the informants wearing either red or blue shirts as they are pointing to objects for the relevant trials in the Epistemic condition. Four photographs of informants demonstrating nice or mean behaviors (see Table 2 for list of behaviors adapted from Baltazar, Shutts, & Kinzler, 2012) were used for the familiarization trials in the Social condition. Eight more photographs (four of the groups and four of the strangers sitting in neutral positions with neutral expressions), were used in the group preference and generalization trials, respectively, for the Social condition. Directly after the catch trials, children were shown photographs of the group members and answered exploratory questions about the groups. In the memory check, children were presented with two photographs of the groups, one displayed directly above the other. These photographs were cropped so that only the people's

---

<sup>1</sup> Data collection is still in progress. The remaining 4 children are being run but I do not anticipate the data to change at this point.

faces were visible, and were in black and white. All photographs were shown on a 15 inch laptop computer using a PowerPoint slideshow. Children's sessions were video recorded for later response coding.

### **Procedure**

Children were seen individually in a lab or a quiet space in their preschool, sitting next to the researcher with the computer screen in front of them. The researcher began by first introducing the two groups of informants displayed on the screen. The group members were sitting around a table with three people sitting close to one another on one side of the table wearing the same color shirts (red) and three other people sitting closely on the other side of the table wearing a different color shirt (blue). Half of the children heard the groups being labeled by their group name on each trial, and the other half did not hear a particular label: "The Red people/these people and the Blue people/these people are going to show you some things and tell you what they are called." The group that was introduced first was counterbalanced across participants. The researcher then asked children to decide who they thought was saying the right thing in the Epistemic condition, or who they thought was doing the nice thing in the Social condition.

**Familiarization trials.** On each of the four familiarization trials, the children in the Epistemic condition learned which group knew the correct familiar object labels. Children in the Social condition learned which group was nice or mean. For each trial, the children in the Epistemic condition saw a photograph displaying the informants in one group pointing to one of two familiar objects. The researcher explained that, "The Red people /these people say this is the shoe, and the Blue people /these people say this is the shoe." The researcher then invited the children to decide, "Who is saying the right thing?" One group was always

correct (pointing to the target object, a shoe, on the table) and the other always incorrect (pointing to a different object, a ball, on the table), but whether it was the red or blue group and which group was discussed first was counterbalanced across participants.

The procedure was the same for children in the Social condition, except that the informants were demonstrated four different types of nice (or mean) behaviors instead of knowledge. For instance, on one trial children learned that the people in the “red” group, “share the cookies,” whereas the people in the “blue” group “steal the cookies.” Informants were depicted with typical expressions corresponding with nice (smiles) and mean (frowns) behaviors and portraying the action that was described. In the case of stealing and sharing cookies, nice informants were shown offering cookies to each other and the mean informants were shown holding cookies close to themselves and turning away from each other. Informants were displayed in this way to illustrate the actions that they were doing and their facial expressions act as an additional cue for niceness or meanness. Children then decided who was “doing the nice thing.” See Table 2 for a description of the objects, labels, and behaviors.

**Group Preference trials.** Immediately after the four familiarization trials, the four group preference trials began. The point of these trials was to verify that children generated the stereotype I expected (knowledgeable or nice) and preferred the group who displayed the desirable characteristic. In the Epistemic condition and Social condition, the procedure is identical to the familiarization trials. The only exception is that the informants pointed to novel objects and novel labels were used in the Epistemic condition and in the Social condition, informants were shown sitting at the table with their hands in their laps and neutral expressions. In the Social condition, descriptions of novel behaviors using past tense novel



verbs were used to describe a previous action that the informants had done (See Tables 1 and 2 for objects and behaviors).

**Generalization trials.** The four generalization trials proceeded in the same manner as the group preference trials, except instead of seeing the two groups, the children saw two strangers. One of these strange individuals wore a red shirt and the other wore a blue shirt. The researcher explained that, “These are new people, and neither of these people have met any of the other people we were just looking at.” She then introduced the game in the same way as she did for the group preference trials: “the Red person/this person and the Blue person/this person are going to show us some things and tell us what they are called.” Who was introduced first was counterbalanced across children.

**Catch trials.** Given the repetitive nature of the previous trials, children could have developed a side bias or may have begun making selections without paying much attention. The two catch trials were similar to the previous four trials and were meant to catch these issues. For children in the Epistemic condition, the two pictured objects were both familiar (See Table 1) and trials proceeded in the same way as the Familiarization trials, except that each stranger was correct once. To pass the catch trials, children chose each stranger once. Similarly, for children in the Social condition the strangers demonstrated one familiar nice and one familiar mean behavior each, such as hitting a plush animal versus hugging a plush animal. Children indicated who was doing the right thing and must choose each informant once in order to pass the catch trials.

**Exploratory Questions.** Directly after the catch trials, the researcher displayed the photographs of the two groups, side by side. The researcher asked three questions about the group members. First, the researcher asked children to identify which group had the positive

characteristic, “Look at these people, can you tell me which people knew more/was nicer.”

The second question was an implicit measure of association relating to shirt color preference:

“If you had the choice between a red or blue shirt to wear, which color shirt would you want to wear?” The third question was open-ended and asked the child to freely answer, “What are the red and blue people like?”

**Theory of Mind Tasks.** After the selective trust task, the researcher assessed children’s theory of mind using a standard testing procedure developed by Wellman and Liu (2004). The tasks were administered in the following order: Diverse Desires, Diverse Beliefs, Knowledge Access, Contents False Belief, Explicit False Belief, and Real-Apparent Emotion (refer to Appendix A for the script for each task).

To pass the Diverse Desires task, children had to differentiate between their own and someone else’s preferences. To pass the Diverse Beliefs task, children had to differentiate between their own belief and someone else’s belief. To pass the Knowledge Access task, children had to understand the not-seeing equals not-knowing rule. In the Contents False Belief task, children had to set their own knowledge aside in order to recognize that someone else likely had an incorrect belief due to prior expectations. In the Explicit False Belief task, children had to recognize how someone’s belief, which is different from their own, will lead to a particular behavior, which would also be different from their own. Finally, the Real-Apparent Emotion task requires children to recognize that outwardly displayed emotions can be different than simultaneous internal feelings. If a participant failed two tasks in a row then the experimenter stopped administering tasks (Wellman & Liu, 2004). This set of tasks is regarded as a reliable and valid measure of preschoolers’ theory of mind ability (Ahmadi, Jalaie, & Ashayeri, 2015; Wellman, Fang, Liu, Zhu, & Liu, 2006; Wellman & Liu, 2004).

**Memory Check.** A memory check was presented at the conclusion of the study to check whether children were able to identify which group members were knowledgeable or nice without shirt color information, showing that they were paying attention to the faces of the informants rather than shirt color alone. Photographs of the group members were altered to be in black and white and the photos were shown stacked on top of each other to remove color or side information. Once prompted to look at the people's faces, the researcher said, "I want you to look at these faces, do you remember who was smarter/nicer? These people or these people?" while pointing to the pictures. In this check, color labels were not used to describe the people so that children had to rely solely on the face information rather than shirt color or side of the screen for the correct answer.

### **Hypotheses**

I expected a main effect of condition: children in the Epistemic condition would have a stronger preference for the groups and strangers with the desirable trait than children in the Social condition. I expected a main effect of trial type: selective preferences would be stronger in the group preference trials than in the generalization trials. I also expected a main effect of age and label: older children and children in Labeled conditions would display stronger preferences for the stranger. Additionally, I expected a negative correlation between performance on the theory of mind tasks and performance on the generalization trials.

### **Results**

Preliminary analyses revealed no effects or interactions involving age or gender. Subsequent analyses were collapsed across these factors. A main effect was found for counterbalancing order (there were 8 orders to which children were semi-randomly assigned) in the generalization trials,  $F(7, 84) = 3.47, p = .003, \text{partial } \eta^2 = .35$ . Pairwise comparisons revealed that orders 1 ( $M = 1.50, SD = 1.00$ ) and 5 ( $M = 1.73, SD = 1.74$ ) had lower scores

than orders 2 ( $M = 3.33$ ,  $SD = 1.15$ ) and 4 ( $M = 3.27$ ,  $SD = 0.79$ ). These results should be considered with caution because of the low sample size ( $n$  ranged from 10–12). Orders 2 and 4 depicted the informants with the desirable trait in blue and orders 1 and 5 depicted the informants with the desirable trait in red. This same pattern was not seen in the other orders. For that reason, and because of the small sample size, order was not considered in subsequent analyses.

As expected, there were significant differences in selective preferences between trial blocks (familiarization, group preference, generalization),  $F(2, 168) = 46.00$ ,  $p < .001$ ,  $\eta^2 = .35$ . Pairwise comparisons using a Bonferroni test showed a significant difference between the familiarization trials ( $M = 3.85$ ,  $SD = 0.44$ ) and group preference trials ( $M = 2.92$ ,  $SD = 1.23$ ),  $p < .001$ . The familiarization trials also differed from the generalization trials ( $M = 2.46$ ,  $SD = 1.35$ ),  $p < .001$ . There was also a significant difference between the group preference and generalization trials,  $p = .019$ . In other words, selective preferences were clearest in the familiarization trials where children knew what the correct object or nice behavior was already, and preferences were the least clear in the generalization trials where children had to extend characteristics from groups to strangers. The results for each trial block are reported below, as well as results for exploratory questions, memory check, and theory of mind.

### **Familiarization Trials**

As expected, children in all four conditions could identify who was saying or doing “the right/nice thing” when the groups were labeling familiar objects or being nice/mean. As Figure 1 shows, children in the Epistemic Labeled and Not-Labeled conditions endorsed the labels from the accurate group on average, 3.87 ( $SD = 0.46$ ) and 3.59 ( $SD = 0.66$ ) out of four

trials, respectively. Children in the Social Labeled and Not-Labeled conditions endorsed the nice group's behaviors as the "nice thing" on average 4.00 ( $SD = 00$ ) and 3.91 ( $SD = 0.29$ ) of four trials, respectively (see Table 3 for means and standard deviations). All four conditions were above what would be expected by chance performance of 2,  $ts > 11.19$ ,  $ps < .001$ ,  $ds > 2.40$ .

A one-way analysis of variance revealed an effect of condition,  $F(3, 88) = 3.94$ ,  $p = .011$ , such that children in the Epistemic Not-Labeled condition were less likely to identify the accurate group than children in the Social Labeled ( $p = .008$ ) and Social Not-Labeled ( $p = .059$ ) conditions. Despite the condition differences, tests against chance show that children in all four conditions formed a clear representation of one group as demonstrating a desirable trait and the other as demonstrating an undesirable trait.

### **Group Preference Trials**

Figure 1 shows the average number of times out of four trials children endorsed the group that earlier demonstrated the desirable trait as a function of condition. As the figure shows, children in the Epistemic Labeled, Social Labeled and Social Not-Labeled conditions did so on 2.91 ( $SD = 1.08$ ), 3.13 ( $SD = 1.33$ ), and 3.17 ( $SD = 1.30$ ) of four trials, respectively. All were higher than what was expected by chance performance of 2,  $ts > 4.03$ ,  $ps < .002$ ,  $ds > 0.83$ . In contrast, children in the Epistemic Not-Labeled condition did not prefer one group over the other. They endorsed novel labels provided by the previously accurate group on 2.45 ( $SD = 1.10$ ) of four trials, which was no different from chance performance,  $t(21) = 1.94$ ,  $p = .066$ . A one-way analysis of variance revealed no significant differences between the conditions,  $F(3, 88) = 1.65$ ,  $p = .184$ . These results suggest that when groups are demonstrating a social trait like kindness, labels are not necessary to encourage

selective trust. In contrast, labels encourage children to use past group status to predict later group status when the context is epistemic.

### **Generalization Trials**

Figure 1 shows the average number of times out of four trials children endorsed the stranger that shared the same shirt color as the previously desirable group as a function of condition. Children in the Epistemic Not-Labeled condition responded at chance ( $M = 2.09$ ,  $SD = 1.23$ ),  $t(21) = .35$ ,  $p = .732$ . Given that these children had earlier not demonstrated selective trust for the group preference trials, this result was not surprising. Children in the Epistemic Labeled condition, in contrast, did generalize trust to the stranger who was explicitly labeled as having been in the desirable group more often than chance, ( $M = 2.74$ ,  $SD = 1.25$ ),  $t(23) = 2.83$ ,  $p = .010$ ,  $d = 0.59$ . Surprisingly, children in the Social Labeled ( $M = 2.50$ ,  $SD = 1.38$ ) and Social Not-Labeled ( $M = 2.52$ ,  $SD = 1.50$ ) conditions were ambivalent between the two strangers,  $t_s < 1.66$ ,  $p_s > .090$ . These data were particularly surprising for the Social-Labeled condition, as children had just selectively trusted the explicitly labeled, desirable group but did not trust the stranger who shared that group membership. A one-way analysis of variance revealed no significant differences between the Social and Epistemic conditions,  $F(3, 88) = .90$ ,  $p = .444$ . These results suggest that children are more willing to generalize group traits to strangers only when they are certain about group membership, and only when the learning context is an epistemic one.

### **Exploratory Questions**

There were three exploratory questions. First, children were asked to identify which group had the desirable trait from the familiarization trials. Across all four conditions, children had little difficulty. Twenty of the 23 children (87%) in the Epistemic Labeled

condition, 19 of the 22 children (86.4%) in the Epistemic Not-Labeled condition, 22 of the 24 children (91.7%) in the Social Labeled condition, and 20 of the 23 children (87%) in the Social Not-Labeled condition responded correctly. These distributions are all greater than expected by chance,  $\chi^2$ s  $> 10.21$ ,  $ps < .001$ , Yates' correction applied.

In the second question, children were asked to choose which shirt color they wanted to wear. Overall, 63 of the 92 children (68.5%) chose the color that was associated with the desirable trait. Sixteen of the 23 children (69.6%) in the Epistemic Labeled condition, 14 of the 22 children (63.6%) in the Epistemic Not-Labeled condition, 17 of the 24 children (70.8%) in the Social Labeled condition, and 16 of the 23 children (69.6%) in the Social Not-Labeled condition responded correctly. The distribution of children in the Social Labeled condition was marginally different from chance,  $\chi^2 = 3.38$ ,  $p = .066$ . The distributions from the other three conditions were all not greater than expected by chance,  $\chi^2$ s  $< 2.79$ ,  $ps > .095$ , Yates' correction applied.

Finally, children were asked to give a free response about what they thought the people in the groups were like. Only 32 of the 92 children (34.8%) provided an accurate trait label (e.g., smart, dumb, nice, mean) for one or more of the groups. Given the small sample size, analyses broken by both trait type and label status was not meaningful, and the following analyses should be interpreted with caution. Collapsing across trait type, of the 32 children who provided trait labels, 23 of them (71.8%) were in a social condition compared to 9 (28.1%) in the epistemic condition; these distributions were significantly different from each other, Fisher's Exact test,  $p = .005$ . Collapsing across label status, 21 of the 32 children (65.6%) were in a Labeled condition and 11 of them (34.4%) were in a Not-Labeled condition; distributions were significantly different, Fisher's Exact test,  $p = .051$ . In other

words, some children may have an easier time spontaneously generating their own trait label for social than epistemic traits, especially if the groups also had explicit labels (i.e., the “red” people vs. “these people”).

### **Memory Check**

At the end of the study, children identified the group that had been knowledgeable or nice in the familiarization trials based only on the group members’ faces (they could not see the shirt color). Additionally, the memory check was implemented after data collection had begun, resulting in 56 of the 92 children being subjected to the memory check. Overall, 42 out of 56 (75%) children who responded identified the correct group. In the Epistemic Labeled condition, 12 of the 16 children (75%) responded correctly on the memory check question. Five of the 11 children (45.5%) in the Epistemic Not-Labeled condition, 15 of the 16 children (93.8%) in the Social Labeled condition, and 10 of the 13 children (76.9%) in the Social Not-Labeled condition responded correctly. Children struggled most in remembering the faces in the Epistemic Not-Labeled condition,  $\chi^2 = 0, p = 1$ . This is interesting, because it is also the condition in which children did not generalize traits to strangers. The distributions are marginally significant against chance performance in the Epistemic Labeled condition,  $\chi^2 = 3.06, p = .080$ , and in the Social Not-Labeled condition,  $\chi^2 = 2.76, p = .09$ , Yates’ correction applied. The Social Labeled condition was well above chance,  $\chi^2 = 10.56, p = .001$ , Yates’ correction applied. These results suggest that most children, except those in the Epistemic Not-Labeled condition, were paying close enough attention to who was in each group that they could correctly identify the groups based on face alone, not shirt color.



### Theory of Mind

Theory of mind scores range from 0 to 6 with a score of 6 indicating greater perspective taking abilities. As expected, the average theory of mind score for children overall was 3.62 ( $SD = 2.06$ ) with older children ( $M = 4.21$ ,  $SD = 1.69$ ) having greater theory of mind skills compared to younger children ( $M = 2.98$ ,  $SD = 2.26$ ),  $t(79.33) = 2.94$ ,  $p = .004$ ,  $d = 0.62$ . A one-way analysis of variance showed that there were no differences in theory of mind score across conditions,  $F(3, 88) = 1.39$ ,  $p = .250$ .

Pearson's  $r$  correlations were conducted to explore whether children's performance on the Theory of Mind task predicted their selective trust in the group preference trials and in the generalization trials. No relationship was found between theory of mind and performance in the group preferences trials for any condition,  $r_s < .29$ ,  $p_s > .177$ . There was also no relationship in the generalization trials,  $r_s < .14$ ,  $p_s > .500$ , in any of the conditions. These results suggest that perspective taking ability does not predict children's likelihood of generalizing traits from groups to groups or groups to strangers.

### Discussion

There were three main results. First, as past research has shown, children readily generate a representation of groups as either desirable or not based on just a few examples of behavior (e.g., Corriveau et al., 2009; Elashi & Mills, 2014; McDonald et al., 2013). Second, whether children extend these group preferences to novel behaviors demonstrated by those same groups depends on the social or epistemic context. For the social trait of kindness, preschoolers will use those past behaviors to judge which groups' novel behaviors are the kind ones. However, children expect group knowledge to be predictive of future group knowledge only if the groups had been explicitly labeled. This result was unexpected, given

the plethora of past research that has demonstrated children's sensitivity to individuals' history of accuracy being a strong cue to future credibility (e.g., Corriveau & Harris, 2009; Jaswal & Neely, 2006; Koenig & Harris, 2005). Third, children are only willing to generalize group stereotypes to strangers when the strangers are providing information, not when they are demonstrating nice or mean behaviors, and only then if the group membership has been made explicit.

In other words, even though children clearly know when groups are being nice or mean, and expect those behaviors to be consistent later, they do not expect the same types of behavior from strangers who are part of the group. And, even though children clearly know when groups are knowledgeable or not, they will only make predictions about that groups' and strangers' knowledge if the group membership is explicit. Theory of mind ability is not related to these judgments. This is the first study to explore how epistemic and social group stereotypes might differentially influence preschoolers' selective preferences. This study adds to our understanding of how group behavior might have implications for children's learning and social relationships with novel group members.

As much previous literature has demonstrated (Jaswal & Neely, 2006, Koenig et al. 2004, Koenig & Harris, 2005), children in three of the four conditions expected groups to behave consistently. But what is interesting is that children seemed to make those assumptions using two different decision rules. When learning about novel nice and mean behaviors, children relied on the groups' past behaviors as an indicator of which novel behaviors were the kind ones. They did not treat labeled and not labeled groups differently. In contrast, in learning about the names of things, children relied on the groups' given label to decide how to categorize novel information. They did not show preferences if they did not

know the group label, even though they clearly knew which group had been previously accurate. Why the difference?

Children may be especially cautious about endorsing conventional information, like the names for things, from people they know little about because unlearning this type of information is cognitively taxing (Jaswal & Kondrad, 2016; Wilkes & Leatherbarrow, 1988). To avoid learning misinformation, children are “epistemically vigilant” (Sperber et al., 2010): they carefully evaluate the informant for cues to credibility to determine when to be skeptical or deferential of the incoming information. Children be especially cautious about trusting a trifecta of previously reliable people about the names for things when it was unclear that they were part of a group with a stable “smart” trait. In previous research that shows that children do extend past accuracy to future accuracy (Koenig et al., 2004), children are normally learning about an individual rather than a group. Children may exercise more caution when it comes to making assumptions about what several individuals who happen to be sitting near one another and wearing similar shirts will know from one moment to the next than they do to one individual. When it is clear that those individuals actually form a group (because the group has a label – here, the “red” group, but in real life, perhaps the “black” kids or the “girls”), children may begin to treat them as a single unit, much as they would a single person. Research on using labels to make category inductions supports this possibility. For example, preschoolers are more likely to make category-consistent assumptions about individual animals when those animals are labeled (e.g., “it’s a bird”) than if the animals were not labeled (Gelman & Coley, 1990).

Not only is unlearning effortful, but also if children later used the incorrect word with someone else it could cause confusion and, perhaps more importantly, have social

consequences. Children consider language expertise to be a powerful marker of in-group and out-group status (Corriveau, Kinzler, & Harris, 2013; Kinzler et al., 2009). Children befriend people who sound like a native speaker and avoid those who sound foreign (Kinzler & DeJesus, 2012). They also endorse information from people who usually know the names for familiar objects and avoid those who do not (Jaswal & Neely, 2006; Koenig et al., 2004; Koenig & Harris, 2005). Children may realize that when they make mistakes, they may be subject to the same treatment: avoided socially and considered “dumb”.

Children in social situations, regardless of whether groups were explicitly labeled or not, expected the *nice* group to be nice later and the *mean* group to be mean later. These results suggest that children considered the behaviors as indicative of a stable trait. Liu, Gelman, and Wellman (2007) conducted a study where 4- and 5-year-old children were asked to make predictions about how a peer would behave now and a month later. Some children heard the peer described with a trait label (selfish, nice, mean, and shy): “This is Bobby and he is mean, Bobby is a very mean boy,” and other children heard the peers’ behavior being described: “Mary walks by a boy carrying a plant...Mary pushes the boy and his plant falls...”. Liu et al. (2007) found that children made trait-consistent predictions when given trait labels but not when they only heard about behaviors. In the current study, children presented with social information were asked who was doing the “nice” thing. Children may have considered this question as indicative of a trait label, even though they were never explicitly told that this was the “nice” group. Because traits are consistent across time, it may have been easier for children in the Social context to assume the group behavior would be consistent than it was in the knowledge-based groups, in which children were asked who was

saying the “right” thing. If we had asked children who was “smart”, which is a trait label, they may have responded more like children in the social context.

Although children in both social situations with and without the category label believed the nice group would be nice again, they did not expect strangers to share the same behavior patterns. Even when it was explicitly clear that the stranger was part of the same group, children were no more likely to think that her novel behaviors were nice as they were the other stranger who was clearly in the other, “mean” group. Why would children not expect strangers to share the same social traits as their group members? One reason is because children had no direct experience with these strangers. They had witnessed for themselves several different types of nice behavior in several different contexts from the groups. It is possible that children were willing to predict that the groups’ behaviors would be stable because they saw that stability earlier for themselves. In fact, that is the very definition of a trait – it is a behavior that is consistent across time and context (Conley, 1985). Children may be unwilling to apply a trait-label to strangers until they have direct confirmation of the behaviors. Additionally, in the social context the group members displayed a variety of nice and mean behaviors. It would be an interesting follow-up study to have a single nice behavior being demonstrated several times. For instance, if one were to focus on sharing as a nice behavior and have the groups display instances of sharing multiple times; perhaps they would be more likely to make inferences about the stranger sharing later when they had seen multiple examples of the group members doing that exact behavior.

This argument may not apply to learning about the names of things. In that case, it seems that children do generalize to strangers if group labels (i.e., “red”) are provided. One reason is because children may not have considered the knowledge being demonstrated by

the group members as a domain-general trait. That is, these groups demonstrated that they were knowledgeable about one domain – the names for things. But knowledge or ignorance in one domain may not be the same thing as having a consistent trait. Indeed, children in the epistemic context provided fewer trait labels in the free response question than those in the social context. If the groups had demonstrated being knowledgeable or ignorant across a wide variety of domains, much like the nice/mean groups demonstrated several different trait-consistent behaviors in a wide variety of contexts, perhaps children would have relied on the history of knowledge as a way to make predictions about group knowledge later. As it stands, children learning about knowledgeability did not seem to consider the behavior as enough evidence to make stable predictions for groups or strangers. They may not have considered the group as possessing a trait. As a result, they relied upon the group label when it was provided instead of the behaviors.

This is not the first time a dual-process model has been proposed to explain the puzzling inconsistencies as to when children apply generalizations about certain behaviors and when they do not (Hermes, Behne, & Rakoczy, 2018; Sobel & Kushnir, 2013). Hermes et al. (2018) argued that unless children have sufficient trait knowledge, they will use a global-impression-formation strategy rather than a rational inductive inference strategy. Applied to this study, that means that because children in the object learning context perhaps did not have sufficient trait knowledge, they generated a global impression of each of the groups as “positive and negative” and used this impression as a general heuristic for answering the question “who is saying the right thing” all the way through from familiar to novel group members. Children may have been able to do this more easily when category labels were given in the epistemic context because they had something concrete (red people)

to which they could associate their general impression. In contrast, children who saw social information may have used a rational inductive inference strategy, which is considered a type II, slow thinking process, because they had sufficient trait knowledge about the groups (Hermes et al., 2018). This more systematic thinking may have resulted in children recognizing the erroneous thinking associated with generalizing traits to strangers based on group membership rather than observation, and thus refraining from stereotyping niceness to the strangers.

In addition to using multiple types of knowledge in order to better establish the desirable trait, it would be interesting to see how children make inferences about *other* traits based on the initial trait representation they form about the groups. A consideration with this procedure is that, in the epistemic context I used object labeling to establish the “smart or dumb” stereotype. Although research in selective trust has shown that children expect reliable object labelers to also have other types of knowledge about objects (Koenig & Harris, 2005), children recognize that certain types of knowledge do not produce a “halo” effect (Koenig & Jaswal, 2011). Future studies could explore whether children will think that unfamiliar group members who are stereotyped as “knowledgeable” would also be knowledgeable in other domains. It would be interesting to explore whether a positive social trait might generalize to positive epistemic expectations about unfamiliar group members (or the other way around).

One of the main findings of this thesis is that in learning situations, group labels mattered for children’s expectations about the knowledge of groups and strangers. Previous literature suggests that generic language activates stereotypes because it signals normative characteristics among members of a category, whereas specific language signals individual,

unique characteristics (Cimpian et al., 2010; Cimpian & Markman, 2011; Gelman, Star, & Flukes, 2002). For example, when 4-year-olds hear that, “Lorches have purple feathers,” they are likely to think that all Lorches share this feature than if they hear that “This Lorch has purple feathers,” (Cimpian et al., 2010). Similarly, Gelman et al. (2002) found that 4-year-olds make more category-based inferences when they hear quantified noun phrases like, “all bears like to eat ants” compared to indefinite plural noun phrases, “some bears...”. In the epistemic context where labels were used, children learned about the groups using generic language and in that same context without group labels the individuals were referred to using specific language. The results support the argument that generic language may increase the likelihood that children will use stereotypes to make judgments about novel category members. Why this did not seem to matter in the social situation is an open question, but I think it is related to the dual-process argument and the trait-state argument described above because an aspect needed for Type II processes to engage is sufficient conceptual background knowledge of a domain which may have been provided when the child was asked who was doing the “nice” thing. Therefore, in social contexts children’s generalizations to the stranger are not as dependent on labeling because they already have that sufficient trait knowledge to engage more deliberate thinking and inhibit stereotyping.

One methodological difference was that in the social situations, the actors wore trait-consistent facial expressions as cues for niceness and meanness in the familiarization trials, whereas actors in the learning situations wore neutral expressions. It is possible that the facial expressions may have made it easier for children to associate a trait with the group behavior in the social context than in the epistemic one because expression acts as an additional cue to niceness and meanness. I think this is unlikely, because children who heard labels in the



epistemic context had equally high rates of recognition as children in both, labeled and non-labeled, social situations for identifying the group with the desirable characteristic at the memory check at the end of the study. The high rates of accuracy were impressive, considering the difficulty of the memory check. Many factors which would indicate the correct group were stripped away in this check (shirt color, side of screen), so children had to answer based only on facial recognition. It is interesting that children who did not hear group labels in the learning situation showed poor accuracy relative to other groups. This is the group of children who struggled to differentiate the groups when labels were not present; – perhaps they were using simple heuristics consistent with a global impression formation strategy such as relying on shirt color to respond to the questions (Hermes et al., 2018).

There are a number of additional questions these data raise. For instance, the current study explored whether children generate representations of groups and generalize those representations to individuals. It would be interesting to explore how children make category deductions if the procedure was reversed. Would children build representations about a single individual and then apply those attributes to an entire group? It would also be interesting to explore whether using trait labels (“smart” or “nice”) rather than category labels (“red” or “blue”) would influence children’s generalizations. Studies suggest that trait labels may have a stronger effect on category inductions than category labels (Diesendruck & HaLevi, 2006; Heyman & Gelman, 2000).

The minimal group membership procedure was used in this study specifically so that child participants would not identify with either group themselves (Otten, 2016). However, shirt color may not be as powerful of a cue to group identity as factors like accent, race or gender because it is an arbitrary category, which does not convey any essential traits of the

category. This may influence how children make inferences about novel exemplars and thus, limit their generalizations. Recall in Bigler's (1995) study, expression of gender stereotypes were greater when teachers identified groups based on gender rather than color. A direction for research would be to explore differences in children's selective preferences of unfamiliar individuals when group membership is established using ecological social categories.

The results presented in this study underscore the importance of better understanding how young children come to generate stereotypes about groups and use those stereotypes to make inductive inferences about strangers. This is important to understand not only because people who may belong to stereotyped groups are affected, but also because using stereotypes to guide interactions with people can profoundly impact what children learn about, who they learn it from, and who they may want to befriend. Importantly, children seem to be more willing in some epistemic contexts to extend trust to strangers based on their group membership than they are in social contexts. In social contexts, children seem to avoid making generalizations from groups to strangers all together. There may be both positive and negative implications of these findings for important social issues, such as the early onset of gender or racial prejudice.

## References

- About, E. E. (1988). *Children and prejudice*. Cambridge: Basil Blackwell.
- Allport, G. (1958). *The nature of prejudice*. Cambridge: Addison-Wesley Pub. Co.
- Ahmadi, S. Z. Z., Jalaie, S., & Ashayeri, H. (2015). Validity and reliability of published comprehensive theory of mind tests of normal preschool children: A systematic review. *Iranian Journal of Psychiatry, 10*, 214-224. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4801491/>
- Baldwin, M. W. (1992). Relational schemas and processing of social information. *Psychological Bulletin, 112*, 461-484. doi: 10.1037/0033-2909.112.3.461
- Baltazar, N. C., Shutts, K., & Kinzler, K. D. (2012). Children show heightened memory for threatening social actions. *Journal of Experimental Child Psychology, 112*, 102-110. doi: 10.1016/j.jecp.2011.11.003
- Bar-Tal, D. (1996). Development of social categories and stereotypes in early childhood: The case of "The Arab" concept formation, stereotype and attitudes by Jewish children in Israel. *International Journal of Intercultural Relations, 20*, 341-370. doi: 10.1016/0147-1767(96)00023-5
- Beilock, S. L., Gunderson, E. A., Ramirez, G., & Levine, S. C. (2010). Female teachers' math anxiety affects girls' math achievement. *Proceedings of the National Academy of Sciences, 107*, 1860-1863. doi: <https://doi.org/10.1073/pnas.0910967107>
- Belsky, J. (2013). Physical and cognitive development. In C. Woods, & E. Epstein (Eds.), *Experiencing the Lifespan* (p.p. 141-174). New York, NY: Worth.

- Bian, L., Leslie, S. J., & Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science*, *355*, 389-391.  
doi: 10.1126/science.aah6524
- Bigler, R. S. (1995). The role of classification skill in moderating environmental influences on children's gender stereotyping: A study of the functional use of gender in the classroom. *Child Development*, *66*, 1072-1087. doi: <https://doi.org/10.1111/j.1467-8624.1995.tb00923.x>
- Bigler, R. S., Jones, L. C., & Lobliner, D. B. (1997). Social categorization and formation of intergroup attitudes in children. *Child Development*, *68*, 530-543.  
doi: <https://doi.org/10.1111/j.1467-8624.1997.tb01956.x>
- Bigler, R. S., & Liben, L. S. (2006). A developmental intergroup theory of social stereotypes and prejudice. *Advances in Child Development and Behavior*, *34*, 39-89.  
doi: [https://doi.org/10.1016/S0065-2407\(06\)80004-2](https://doi.org/10.1016/S0065-2407(06)80004-2)
- Bigler, R. S., & Liben, L. S. (2007). Developmental intergroup theory: Explaining and reducing children's social stereotyping and prejudice. *Current Directions in Psychological Science*, *16*, 162-166. doi: <https://doi.org/10.1111/j.1467-8721.2007.00496.x>
- Boseovski, J. J., & Thurman, S. L. (2014). Evaluating and approaching a strange animal: Children's trust in informant testimony. *Child Development*, *85*, 824-834.  
doi: 10.1111/cdev.12156
- Chen, E. E., Corriveau, K. H., & Harris, P. L. (2012). Children trust a consensus composed of outgroup members--but do not retain that trust. *Child Development*, *84*, 269-282.  
doi: 10.1111/j.1467-8624.2012.01850.x

- Cimpian, A., Brandone, A. C., & Gelman, S. A. (2010). Generic statements require little evidence for acceptance but have powerful implications. *Cognitive Science*, *34*, 1452-1482. doi: 10.1111/j.1551-6709.2010.01126.x
- Cimpian, A., & Markman, E. M. (2009). Information learned from generic language becomes central to children's biological concepts: Evidence from their open-ended explanations. *Cognition*, *113*, 14-25.  
doi:<https://doi.org/10.1016/j.cognition.2009.07.004>
- Cimpian, A., & Markman, E. M. (2011). The generic/nongeneric distinction influences how children interpret new information about social others. *Child Development*, *82*, 471-492. doi: 10.1111/j.1467-8624.2010.01525.x
- Cimpian, A., & Scott, R. M. (2012). Children expect generic knowledge to be widely shared. *Cognition*, *123*, 419-433. doi: 10.1016/j.cognition.2012.02.003
- Coley, J. D., Medin, D. L., & Atran, S. (1997). Does rank have its privilege? Inductive inferences within folkbiological taxonomies. *Cognition*, *64*, 73-112.  
doi: [http://dx.doi.org/10.1016/S0010-0277\(97\)00017-6](http://dx.doi.org/10.1016/S0010-0277(97)00017-6)
- Conley, J. J. (1985). Longitudinal stability of personality traits: A multitrait-multimethod-multioccasion analysis. *Journal of Personality and Social Psychology*, *49*, 1266-1282.  
doi: <http://dx.doi.org/10.1037/0022-3514.49.5.1266>
- Corriveau, K. H., Fusaro, M., & Harris, P. L. (2009). Going with the flow: Preschoolers prefer nondissenters as informants. *Psychological Science*, *20*, 372-377.  
doi: 10.1111/j.1467-9280.2009.02291.x

- Corriveau, K. H., & Harris, P. L. (2009). Preschoolers continue to trust a more accurate informant 1 week after exposure to accuracy information. *Developmental Science, 12*, 188-193. doi: 10.1111/j.1467-7687.2008.00763.x
- Corriveau, K. H., & Harris, P. L. (2010). Preschoolers (sometimes) defer to the majority in making simple perceptual judgements. *Developmental Psychology, 46*, 437-445. doi: 10.1037/a0017553
- Corriveau, K. H., Kinzler, K. D., & Harris, P. L. (2013). Accuracy trumps accent in children's endorsement of object labels. *Developmental Psychology, 49*, 470-479. doi: 10.1037/a0030604
- Corriveau, K. H., Meints, K., & Harris, P. L. (2009). Early tracking of informant accuracy and inaccuracy. *British Journal of Developmental Psychology, 27*, 331-342. doi: <https://doi.org/10.1348/026151008X310229>
- Cuevas, K., & Bell, M. A. (2014). Infant attention and early childhood executive function. *Child Development, 85*, 397-404. doi: 10.1111/cdev.12126
- Diesendruck, G., & HaLevi, H. (2006). The role of language, appearance, and culture in children's social category-based induction. *Child Development, 77*, 539-553. doi: 10.1111/j.1467-8624.2006.00889.x
- Eagley, A. H., & Steffen, V. J. (1984). Gender stereotypes stem from the distribution of women and men into social roles. *Journal of Personality and Social Psychology, 46*, 735-754. doi: <http://dx.doi.org/10.1037/0022-3514.46.4.735>
- Elashi, F., & Mills, C. (2014). Trust based on group membership or accuracy? The role of group membership on children's trust decisions. *Journal of Experimental Child Psychology, 128*, 88-104. doi: <https://doi.org/10.1016/j.jecp.2014.07.003>

- Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: Decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of Personality and Social Psychology, 78*, 704-728. doi: 10.1037//0022-3514.78.4.708
- Gelman, S. A. (2003) *The Essential Child: Origins of Essentialism in Everyday Thought*, Oxford University Press.
- Gelman, S. A., & Coley, J. D. (1990). The importance of knowing a Dodo is a bird: Categories and inferences in 2-year-old children. *Developmental Psychology, 26*, 796-804. doi: <http://dx.doi.org/10.1037/0012-1649.26.5.796>
- Gelman, S. A., Star, J. R., & Flukes, J. E. (2002). Children's use of generics in inductive inferences. *Journal of Cognition and Development, 3*, 179-199.  
doi: 10.1207/S15327647JCD0302\_3
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*, 4-27.  
doi: <http://dx.doi.org/10.1037/0033-295X.102.1.4>
- Hammond, M. D., & Cimpian, A. (2017). Investigating the cognitive structure of stereotypes: Generic beliefs about groups predict social judgments better than statistical beliefs. *Journal of Experimental Psychology: General, 146*, 607-614.  
doi: <http://dx.doi.org/10.1037/xge0000297>
- Haslam, N., Rothschild, L., & Ernst, D. (2000). Essentialist beliefs about social categories. *British Journal of Social Psychology, 39*, 113-127.  
doi: <https://doi.org/10.1348/014466600164363>

- Hermes, J., Behne, T., & Rakoczy, H. (2018). The development of selective trust: Prospects for a dual process account. *Child Development Perspectives*, advance online publication. doi: 10.1111/cdep.12274
- Heyman, G., & Gelman, S. A. (2000). Preschool children's use of novel predicates to make inductive inferences. *Cognitive Development*, 15, 263-280. doi:10.1016/S0885-2014(00)00028-9
- Hilton, J. L., & Von Hippel, W. (1996). Stereotypes. *Annual Review of Psychology*, 47, 237-271. doi: <https://doi.org/10.1348/014466600164363>
- Hirschfeld, L. A. (1996). *Race in the making: Cognition, culture, and the child's construction of human kinds*. Cambridge, Mass: MIT Press.
- Imai, M., Gentner, D., & Uchida, N. (1994). Children's theories of word meaning: The role of shape similarity in early acquisition. *Cognitive Development*, 9, 45-75. doi: 10.1016/0885-2014(94)90019-1
- Jaswal, V. K. (2004). Don't believe everything you hear: Preschoolers' sensitivity to speaker intent on category induction. *Child Development*, 75, 1871-1885. doi: <https://doi.org/10.1111/j.1467-8624.2004.00822.x>
- Jaswal, V. K., & Kondrad, R. L. (2016). Why children are not always epistemically vigilant: Cognitive limits and social considerations. *Child Development Perspectives* 0, 1-5. doi: 10.1111/cdep.12187
- Jaswal, V. K., McKercher, D. A., & VanderBorgh, M. (2008). Limitations on reliability: Regularity rules in the English plural and past tense. *Child Development*, 79, 750-760. doi: 10.1111/j.1467-8624.2008.01155.x



- Jaswal, V. K., & Neely, L. A. (2006). Adults don't always know best: Preschoolers use past reliability over age when learning new words. *Psychological Science, 17*, 757-758.  
doi:10.1111/j.1467-9280.2006.01778.x
- Johnston, A. M., Mills, C. M., & Landrum, A. R. (2015). How do children weigh competence and benevolence when deciding whom to trust? *Cognition, 144*, 76-90.  
doi: <http://dx.doi.org/10.1016/j.cognition.2015.07.015>
- Katz, P. A. (1976). The acquisition of racial attitudes in children. In P. A. Katz (Ed.), *Towards the elimination of racism* (pp. 125-154). New York: Pergamon Press.
- Keates, J., & Graham, S. A. (2008). Category markers or attributes: Why do labels guide infants' inductive inferences? *Psychological Science, 19*, 1287-1293.  
doi: 10.1111/j.1467-9280.2008.02237.x
- Kinzler, K. D., Corriveau, K. H., & Harris, P. L. (2011). Children's selective trust in native-accented speakers. *Developmental Science, 14*, 106-111. doi: 10.1111/j.1467-7687.2010.00965.x
- Kinzler, K. D., & DeJesus, J. M. (2012). Children's sociolinguistic evaluations of nice foreigners and mean Americans. *Development Psychology, 49*, 655-664.  
doi: 10.1037/a0028740
- Kinzler, K. D., Shutts, K., DeJesus, J., & Spelke, E.S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition, 27*, 623-634.  
doi:10.1521/soco.2009.27.4.623
- Kinzler, K. D., & Spelke, E. S. (2011). Do infants show social preferences for people differing in race? *Cognition, 119*, 1-9. doi:10.1016/j.cognition.2010.10.019

- Koenig, M., Clement, F., Harris, P. L. (2004). Trust in testimony: Children's use of true and false statements. *Psychological Science, 15*, 694-698. doi: 10.1111/j.0956-7976.2004.00742.x
- Koenig, M., & Harris, P. L. (2005). Preschoolers mistrust ignorant and inaccurate speakers. *Child Development, 76*, 1261-1277. doi: <https://doi.org/10.1111/j.1467-8624.2005.00849.x>
- Koenig, M. A., & Jaswal, V. K. (2011). Characterizing children's expectations about expertise and incompetence: Halo or pitchfork effects? *Child Development, 82*, 1634-1647. doi: 10.1111/j.1467-8624.2011.01618.x
- Landrum, A. R., Pflaum, A. D., & Mills, C. M. (2015). Inducing knowledgeability from niceness: Children use social features for making epistemic inferences. *Journal of Cognition and Development, 17*, 699-717.  
doi: <https://doi.org/10.1080/15248372.2015.1135799>
- Langlois, J. H., Roggman, L. A., Casey, R. J., Ritter, J. M., Rieser-Danner, L. A., & Jenkins, V. Y. (1987). Infant preferences for attractive faces: Rudiments of a stereotype? *Developmental Psychology, 23*, 363-369. doi: <http://dx.doi.org/10.1037/0012-1649.23.3.363>
- Liu, D., Gelman, S. A., & Wellman, H. M. (2007). Components of young children's trait understanding: Behavior-to-trait inferences and trait-to-behavior predictions. *Child Development, 78*, 1543-1558. doi:10.1111/j.1467-8624.2007.01082.x
- Mahajan, N., & Wynn, K. (2012). Origins of "us" versus "them": Prelinguistic infants prefer similar others. *Cognition, 124*, 227-233.  
doi: <https://doi.org/10.1016/j.cognition.2012.05.003>

- Mahy, C. E., Moses, L. J., & Pfeifer, J. H. (2014). How and where: Theory-of-mind in the brain. *Developmental Cognitive Neuroscience, 9*, 68-81.  
doi: <https://doi.org/10.1016/j.dcn.2014.01.002>
- Mareschal, D., & Quinn, P. C. (2001). Categorization in Infancy. *TRENDS in Cognitive Sciences, 5*, 443-450. doi: [https://doi.org/10.1016/S1364-6613\(00\)01752-6](https://doi.org/10.1016/S1364-6613(00)01752-6)
- McDonald, K., Schug, M., Chase, E., & Barth, H. (2013). My people, right or wrong? Minimal group membership disrupts preschoolers' selective trust. *Cognitive Development, 28*, 247- 259. doi: <https://doi.org/10.1016/j.jecp.2016.03.011>
- McGarty, C., Yzerbyt, V. Y., & Spears, R. (2002). Social, cultural and cognitive factors in stereotype formation. In C. McGarty, V. Yzerbyt, & R. Spears (Eds.). *Stereotypes as Explanations: The formation of meaningful beliefs about social groups*( pp. 1-15). UK: Cambridge University Press.
- Medin, D. L., & Ortony, A. (1989). Psychological essentialism. In S. Vosniadou & A. Ortony (Eds.), *Similarity and analogical reasoning*. UK: Cambridge University Press.
- Medin, D. L., & Smith, E. E. (1981). Strategies and classification learning. *Journal of Experimental Psychology: Human Learning and Memory, 7*, 241-253.  
doi: <http://dx.doi.org/10.1037/0278-7393.7.4.241>
- Meiser, T., & Hewstone, M. (2004). Cognitive processes in stereotype formation: The role of correct contingency learning for biased group judgements. *Journal of Personality and Social Psychology, 87*, 599-614. doi:10.1037/0022-3514.87.5.599
- Mulvey, K. L., Rizzo, M. T., & Killen, M. (2016). Challenging gender stereotypes: Theory of mind and peer group dynamics. *Developmental Science, 19*, 999-1010.  
doi:10.1111/desc.12345

- Otten, S. (2016). The minimal group paradigm and its maximal impact in research on social categorization. *Current Opinion in Psychology, 11*, 85-89.  
doi: <https://doi.org/10.1016/j.copsyc.2016.06.010>
- Palmquist, C. M., Jaswal, V. K., Rutherford, A. (2016). Success inhibits preschoolers' ability to establish selective trust. *Journal of Experimental Child Psychology, 152*, 192-204.  
doi: <https://doi.org/10.1016/j.jecp.2016.07.015>
- Piaget, J. (1970). Piaget's theory. In H. Mussen (Ed.), *Carmichael's manual of child psychology* (3rd ed., pp. 703-710). New York: Wiley.
- Rhodes, M. (2012). Naïve theories of social groups. *Child Development, 00*, 1-17.  
doi: [10.1111/j.1467-8624.2012.01835.x](https://doi.org/10.1111/j.1467-8624.2012.01835.x)
- Rhodes, M. (2013). How two intuitive theories shape the development of social categorization. *Child Development Perspectives, 7*, 12-16. doi: [10.1111/cdep.12007](https://doi.org/10.1111/cdep.12007)
- Rhodes, M., & Gelman, S. A. (2009). A developmental examination of conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cognitive Psychology, 59*, 244-274. doi:[10.1016/j.cogpsych.2009.05.001](https://doi.org/10.1016/j.cogpsych.2009.05.001)
- Rhodes, M., Leslie, S., & Tworek, C. M. (2012). Cultural transmission of social essentialism. *Proceedings of the National Academy of Sciences, 109*, 13526-13531.  
doi: <https://doi.org/10.1073/pnas.1208951109>
- Rothbart, M., & Taylor, M. (1992). Category labels and social reality: Do we view social categories as natural kinds? In G. R. Semin & K. Fiedler (Eds.), *Language, interaction and social cognition* (pp. 11-36). London: Sage.
- Sabbagh, M. A., Xu, F., Carlson, S. M., Moses, L. J., Lee, K. (2006). The development of executive functioning and theory of mind. *Psychological Science, 17*, 74-81.

- doi: 10.1111/j.1467-9280.2005.01667.x
- Shutts, K., Kinzler, K. D., McKee, C. B., Spelke, E. S. (2009). Social information guides infants' selection of foods. *Journal of Cognitive Development, 10*, 1-17.  
doi:10.1080/15248370902966636
- Sobel, D. M., & Kushnir, T. (2013). Knowledge matters: How children evaluate the reliability of testimony as process of rational inference. *Psychological Review, 4*, 779-797. doi: 10.1037/a0034191
- Sperber, D., Clement, F., Heintz, C., Mascaro, O., Mercier, H., Origg, G., & Wilson, D. (2010). Epistemic Vigilance. *Mind and Language, 25*, 359-393.  
doi: <https://doi.org/10.1111/j.1468-0017.2010.01394.x>
- Tajfel, H. (1969). Cognitive aspects of prejudice. *Journal of Social Issues, 25*, 79-97.
- Tenney, E. R., Small, J. E., Kondrad, R. L., Jaswal, V. K., & Spellman, B. A. (2011). Accuracy, confidence, and calibration: How young children and adults assess credibility. *Developmental Psychology, 47*, 1065. doi: 10.1037/a0023273
- VanderBorgh, M., & Jaswal, V. K. (2009). Who knows best? Preschoolers sometimes prefer child informants over adult informants. *Infant Child Development, 1*, 61-71.  
doi:10.1002/icd.591
- Wellman, H. M., Fang, F., Liu, D., Zhu, L., & Liu, G. (2006) Scaling of theory-of-mind understanding in Chinese children. *Psychological Science, 17*, 1075-1081.  
doi: 10.1111/j.1467-9280.2006.01830.x
- Wellman, H. M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development, 75*, 523-541. doi: <https://doi.org/10.1111/j.1467-8624.2004.00691.x>

- Wilkes, A. L., & Leatherbarrow, M. (1988). Editing episodic memory following the identification of error. *The Quarterly Journal of Experimental Psychology*, *40*, 361-387. doi: <https://doi.org/10.1080/02724988843000168>
- Zelazo, P. D., Carlson, S. M., & Kezek, A. (2008). The development of executive function in childhood. In C. Nelson, & M. Luciana (Eds.), *Handbook of Developmental Cognitive Neuroscience* (2 ed.). Cambridge, MA: MIT Press.

### Tables

**Table 1.**

*Stimuli and Labels for the Epistemic Condition*

Object Used	Label Used
Familiarity trials	
Ball versus shoe	“Which is the shoe?”
Cup versus dog	“Which is the cup?”
hat versus book	“Which is the book?”
Spoon versus bottle	“Which is the spoon?”
Group preference trials	
Rubber squeegee versus deer warner	“Which is the toma?”
Hose nozzle versus toilet flapper	“Which is the modi?”
Strainer versus cocktail pourer	“Which is the dawnoo?”
Shin pad versus door hook	“Which is the dax?”
Generalization trials	
Paint roller versus potato masher	“Which is the fliff?”
Grey funnel versus oil filter	“Which is the feppin?”
Garlic press versus hose attachment	“Which is the riff?”
Siphon versus lemon juicer	“Which is the terval?”
Catch trials	
Banana versus orange	“Which is the orange?”
Elephant versus horse	“Which is the horse?”

**Table 2.***Behaviors Used in the Social Condition*

Nice Behavior /Verbs	Mean Behavior/Verbs
Familiarity trials	
Giving cookies	Stealing cookies
Helping someone	Pushing someone
Saying nice things	Saying mean things
Sharing toys	Breaking toys
Group Preference trials	
Rosted the spoon	Mizzed the spoon
Daxed the hat	Larped the hat
Tooded the shoe	Blicked the shoe
Gabbered the cup	Fliffed the cup
Generalization trials	
Zaved the book	Clided the book
Froomed the ball	Vogged the ball
Jiped the bottle	Cotted the bottle
Pogged the dog	Rixxed the dog
Catch trials	
Taping someone's paper	Tearing someone's paper
Hugging someone	Hitting someone



**Table 3.** Means and Standard Deviations by Trait and Identification Condition

Condition	<i>n</i>	Familiarization Trials		Group Preference Trials		Generalization Trials	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Epistemic Labeled	23	3.87*	0.46	2.91*	1.08	2.74*	1.25
Epistemic Not-Labeled	22	3.59*	0.66	2.45	1.10	2.09	1.23
Social Labeled	24	4.00*	0.00	3.13*	1.33	2.50	1.38
Social Not-Labeled	23	3.91*	0.28	3.17*	1.30	2.52	1.50

*Note.* \* indicates means that are significantly different from chance at a *p* value of .05

**Figures**

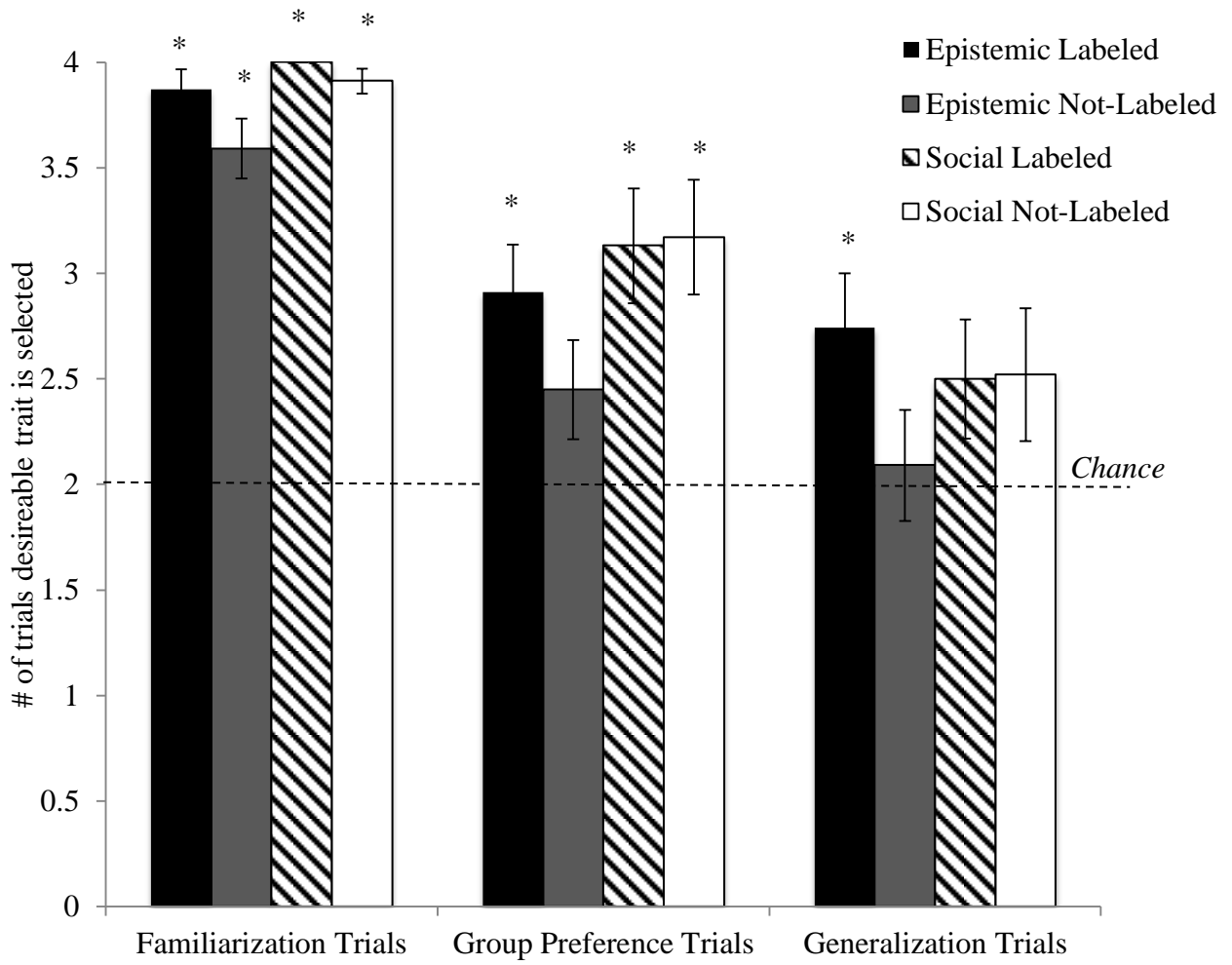


Figure 1. Means of performance in each trial block by trait and identification condition

\* indicates conditions that are significantly different from chance at a .05 p value.

## Appendix A

### Wellman and Liu (2004) Theory of Mind Tasks

1. **Diverse Desires:** Children see a toy figure of an adult and a sheet of paper with a carrot and a cookie drawn on it. “Here’s Mr. Jones. It’s snack time, so, Mr. Jones wants a snack to eat. Here are two different snacks: a carrot and a cookie. Which snack would you like best? Would you like a carrot or a cookie best?” *Point to each of the images as you say the names.* This is the *own desire question*.

If the child chooses the carrot: “Well, that’s a good choice, but Mr. Jones really likes cookies. He doesn’t like carrots. What he likes best are cookies.” (Or, if the child chooses the cookie, he or she is told Mr. Jones likes carrots.) Then the child is asked the *target question*: “So now it’s time to eat. Mr. Jones can only choose one snack, just one. Which snack will Mr. Jones choose? A carrot or a cookie?”

Correct: Child must answer the *target question* opposite from his or her answer to the *own desire question*.

2. **Diverse Beliefs:** Children see a toy figure of a girl and a sheet of paper with bushes and a garage drawn on it. “Here’s Linda. Linda wants to find her cat. Her cat might be hiding in the bushes or it might be hiding in the garage [*point to each image as you say the names*]. Where do you think the cat is? In the bushes or in the garage?” *Point to each of the images as you say the names.* This is the *own belief question*.

If the child chooses the bushes: “Well, that’s a good idea, but Linda thinks her cat is in the garage. She thinks her cat is in the garage.” (Or, if the child chooses the garage, he or she is told Linda thinks her cat is in the bushes.) Then the child is asked the *target question*: “So where will Linda look for her cat? In the bushes or in the garage?”

Correct: Child must answer the *target question* opposite from his or her answer to the *own belief question*.

3. **Knowledge Access:** Children see a nondescript box containing a small object inside. “Here’s a box. What do you think is inside this box?” (The child can give any answer he or she likes or indicate that he or she does not know). Next, the box is opened and the child is shown the contents of the box: “Let’s see...it’s really an X inside!” Close the box: “OK, what is the box?”

Then a toy figure of a girl is produced: “Polly has never ever seen inside this box. Now here comes Polly. So, does Polly know what is in the box? (the *target question*) “Did Polly see inside this box?” (the *memory question*).

Correct: Child must answer the *target question* “no” and answer the *memory question* “no”.

4. **Contents False Belief:** The child sees a clearly identifiable band-aid box with a plastic toy animal inside the closed box. “Here’s a band-aid box. What do you think is inside the band-aid box? Next, the band-aid box is opened: “Let’s see...it’s really an X inside!” This band-aid box is closed: “OK, what is inside the band-aid box?”

Then a toy figure of a boy is produced: “Peter has never ever seen inside this band-aid box. Now here comes Peter. So what does Peter think is in the box? Band-aids or an X? (the *target question*) “Did Peter see inside the box? (the *memory question*).

Correct: Child must answer the *target question* “band-aids” and the *memory question* “no”.

5. **Explicit False Belief:** Children see a toy figure of a boy and a sheet of paper with a backpack and a closet drawn on it. “Here’s Scott. Scott wants to find his mittens. His mittens might be in his backpack or they might be in the closet. *Really*, Scott’s mittens are in his backpack. But Scott *thinks* his mittens are in the closet.”

“So, where will Scott look for his mittens? In his backpack or in the closet?” *Point to each of the images as you say the names.* (the *target question*). “Where are Scott’s mittens really? In his backpack or in the closet?” *Point to each of the images as you say the names.* (the *reality question*).

Correct: Child must answer the *target question* “closet” and the *reality question* “backpack”.

6. **Real-Apparent Emotion:** Initially, children see a sheet of paper with three faces drawn on it – a happy, a neutral, and a sad face – to check that the child knows these emotional expressions. Then that paper is put aside, and the task begins with the child being shown a picture of a boy drawn from the back to that the boy’s facial expression cannot be seen. “This story is about a boy. I’m going to ask you about how the boy really feels inside [*touch your chest*] and how he looks on his face [*touch your face*].”

“This story is about Matt. Matt’s friends were playing together and telling jokes. One of the older children, Rosie, told a mean joke about Matt and everyone laughed. Everyone thought it was very funny, but *not* Matt. But Matt did want the other children to see how he felt about the joke, because they would call him names. So, Matt tried to *hide how he felt*.” Then the child gets two memory checks: “What did the other children do when Rosie told a mean joke about Matt?” (laughed/thought it was funny). “In the story, what would the other children do if they knew how Matt felt?” (call him names/tease him).

Pointing to the emotion pictures: “So how did Matt really feel when everyone laughed? Did he feel happy, sad, or OK?” (the *target-feel question*) “How did Matt try to look on his face, when everyone laughed? Did he look happy, sad, or OK?” (the *target-look question*).

Correct: Child’s answer to the *target-feel question* must be more negative than his or her answer to the *target-look question*

**Appendix B**

**INSTITUTIONAL REVIEW BOARD**  
Office of Research Protections  
ASU Box 32088  
Boone, NC 28608  
828.262.2692  
Web site: <http://researchprotections.appstate.edu>  
Email: [irb@appstate.edu](mailto:irb@appstate.edu)  
Federalwide Assurance (FWA) #00001076

**To:** Robyn Kondrad  
Psychology  
CAMPUS EMAIL

**From:** Lisa Curtin, PhD, IRB Chairperson  
**Date:** 5/16/2017  
**RE:** Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)

**STUDY #:** 17-0277  
**STUDY TITLE:** Selective Trust in Young Children  
**Submission Type:** Initial  
**Expedited Category:** (6) Collection of Data from Recordings made for Research Purposes,(7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.  
**Approval Date:** 5/16/2017  
**Expiration Date of Approval:** 5/15/2018

The Institutional Review Board (IRB) approved this study for the period indicated above. The IRB found that the research procedures meet the expedited category cited above. IRB approval is limited to the activities described in the IRB approved materials, and extends to the performance of the described activities in the sites identified in the IRB application. In accordance with this approval, IRB findings and approval conditions for the conduct of this research are listed below.

### **Vita**

Megan Nicole Norris was born in Greenville, South Carolina to Pleas and Carol Norris. She graduated from Blue Ridge High School in May 2012. Later that year, she entered North Greenville University to study Psychology, and was awarded a Bachelor of Science in the spring of 2016. She accepted a research assistantship in Experimental Psychology at Appalachian State University and began study towards a Master of Arts degree. The M.A. was awarded May 2018. In the fall of 2018, Megan continued her education at the University of Louisville in pursuance of a PhD in Experimental Psychology with a concentration in Developmental Psychology.