WHO TO TRUST? PRESCHOOLERS AND THEIR DECISIONS

A Thesis

presented to

the Faculty of the Graduate School

at the University of Missouri-Columbia

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

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MAY 2024

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

WHO TO TRUST? PRESCHOOLERS AND THEIR DECISIONS

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and hereby certify that, in their opinion, it is worthy of acceptance.

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ACKNOWLEDGEMENTS

I would like to thank my advisor, Dr. Yuyan Luo, for her mentorship and support on this project. Thank you to Drs. Donte Bernard and Rachel Thibodeau-Nielsen for their insightful feedback and guidance throughout the construction of this thesis. I would like to thank my friends and colleagues, Victoria Aceves-Power, Madeline Patrick, and Allie Spiekerman for their continued support and encouragement.

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Abstract

Trust in others' competence and capacity to do promised and expected actions is critical and serves important purposes in children's development. Children's trust in unfamiliar others for social support and promise keeping (social trust; Markson & Luo, 2020) has been little understood, and recent work has focused on children's trust in others' epistemic states (epistemic trust; Corriveau et al., 2013; Koenig et al., 2004). The present study examined how preschoolers make trust decisions as a function of the type of trust (social or epistemic) and the intergroup factor of race. In two experiments, children's social trust of same- and different-race agents were measured. Although children did not differ in their wait times in a marshmallow task for a same- or different-race agent (Experiment 1), children were more likely to choose a same- over a different-race agent to provide assistance, with marginal significance (Experiment 2). Children, however, did not consider race in their epistemic trust judgments in a learning task (Experiment 3). The implications of these results to the early development of race-based choices are discussed.

Who to Trust? Preschoolers and Their Decisions

Trust – the belief in the reliability, truth, or capacity of another person to do a promised or expected action (Hardin, 2002) - is critical in social interactions and relationships with others (Baier, 1986; Balliet et al., 2013; Bowlby, 1969; Erikson, 1950, 1963; Fiske et al., 2007; Simpson, 2007). Erikson (1950, 1963) theorized trust in familiar others formed early in life as one of the most important milestones of interpersonal development. In recent cognitive developmental work on this topic, the focus has been on trust in unfamiliar others (e.g., an experimenter in a laboratory task), which depends on the purpose such trust serves, either providing support and reassurance in social interactions (social trust; Markson & Luo, 2020), or learning information and acquiring knowledge from others (epistemic trust; e.g., Harris, 2012; Koenig & Sabbagh, 2013; Mills, 2013; Poulin-Dubois & Brosseau-Liard, 2016; Sobel & Kushnir, 2013). While social trust has been less examined in early childhood (Markson & Luo, 2020), previous work indicates that preschool-aged children weigh a variety of factors in their epistemic trust judgments, such as others' social category membership and accuracy (Chen et al., 2018; Corriveau et al., 2013; Koenig et al., 2004). The current study aims to probe how social trust, epistemic trust, and various factors such as a child's and an experimenter's race/ethnicity and the child's socioeconomic status (SES) may work together in young children's decisions on who to trust.

Social Trust

Social trust is defined as an individual's trust in others in social interactions (Markson & Luo, 2020). Such trust is based on a belief that others will behave predictably (e.g., by keeping promises) and provide support, in accord with social norms

and perhaps with good intentions. Social trust thus allows for a sense of reassurance as children navigate their social world and interact with different people. The famous "marshmallow task," a snack-task focused on delay of gratification in children (Mischel & Ebbesen, 1970), has been repurposed to examine social trust in strangers. e.g., an agent providing the snack (Kidd, et al., 2018; Michaelson & Munakata, 2016). In the task, children are given one marshmallow by the agent and told if they do not eat it while the agent leaves the room, she will bring them a second marshmallow. The children do not know when the agent will be back, and the wait time is capped at 15 minutes. If children successfully wait for the second marshmallow promised to them by the agent, they exhibit higher levels of inhibition and self-regulation, which is linked to academic and economic success later in life (Watts et al., 2018). Crucially, since children must trust the agent will keep her promise of returning with the second marshmallow and wait for her for an uncertain period, children's performance in the marshmallow task (e.g., wait time) is indicative of their social trust.

Researchers have experimentally manipulated children's social trust in modified versions of the marshmallow task. For example, children watched as an agent damaged another experimenter's art project accidentally or purposedly, and either admitted to their mistake or lied about being involved (Michaelson & Munakata, 2016). Next, the agent administered the marshmallow task with the children. When children watched the agent admit to her mistake, they waited significantly longer than children who watched the agent tell a lie (Michaelson & Munakata, 2016). Therefore, children are sensitive to the untrustworthy behavior of others and use this information to inform their social trust decisions, which in turn influences their wait time in the marshmallow task. Further,

agents' reliability in keeping promises directly influences children's success in the marshmallow task (Kidd et al., 2013). Before the marshmallow task, an agent provided children with old crayons and stickers to complete an art project but promised them she would return with new crayons and more exciting stickers. After leaving the room, the agent returned with new crayons and stickers and hence kept her promises, or returned empty-handedly and said she did not have any, and thus broke her promises. Next, the children participated in the marshmallow task with the same agent. When the agent kept their promise, 9 of 14 participants waited the full 15 min for the second marshmallow, whereas only 1 of 14 participants did for the agent who had broken her promises previously (Kidd et al., 2013). Such a difference was also found in the average wait time of the two groups of participants. These findings indicate that children are susceptible to social interactions they witness and use them to form judgements about who to trust and what to expect from those around them. Furthermore, while the agent broke a promise (Kidd et al., 2013), there was also some implication of environmental unreliability in that the items of the child's immediate interest (crayons and stickers) were not readily available, which might have affected children's decisions to wait in the subsequent marshmallow task.

In fact, differential susceptibility in the immediate environment children live in also influences their predictability and belief in the actions and promises of others, as reflected in the finding that children in low-income environments naturally shift to accepting an immediate reward versus waiting for another opportunity to arise (Sturge-Apple et al., 2016). In resource-poor environments, the skill to delay gratification by not eating a snack may not be adaptive due to everchanging reliability in food. While those

within a resource-rich environment (e.g., high SES) are better suited to wait for a more exciting reward which they expect will occur, children in a resource-poor environment do not hold the same trust and belief that another opportunity will come (Sturge-Apple et al., 2016). Therefore, environmental predictability and the interpretation of social contexts influences children's expectation of their social world. These perceptions may further play a critical role in the development of trust and social interactions.

Therefore, social trust research early in development has noted key factors children use to determine reliability in others, focusing on their performance in the marshmallow task. Specifically, children are sensitive to the intentions (and honesty) of others (Michaelson & Munakata, 2016), their previous promise-keeping behavior (Kidd, et al., 2018), and the environmental (un)predictability as indicated by children's SES backgrounds (Sturge-Apple, et al., 2016). Regarding a prominent social group membership marker, race/ethnicity, its impact on children's social trust decisions remains unknown. It is important to note that most existing work relevant to this group membership marker has been conducted among different racial groups (e.g., Chen et al., 2018; Dunham et al., 2013; Gaither et al., 2014), with very little known about ethnic group comparisons between Hispanic and non-Hispanic. Given the local population, the focus of the present research was on race. Furthermore, when choosing to interact with same- or different-race others, previous work has found that by age three, White children exhibit robust same-race preferences (Dunham et al., 2013; Qian et al., 2016). If these racial preferences also extended to social situations in which White children need to trust unfamiliar others, then these preferences would manifest when children interact with same-race and different-race agents. The present study aimed to examine this possibility.

Given the impact of SES on children's performance in the marshmallow task, we also recruited children from various SES backgrounds. In addition to using the marshmallow task, a second social trust task was administered, which would allow task comparisons and in turn enrich our understanding of children's social trust, given the limited work on this topic so far.

Epistemic Trust

Epistemic trust, compared to social trust, has received more empirical attention in the past two decades of cognitive developmental research. Epistemic trust is defined as the willingness to accept and learn information from others (Koenig et al., 2004). Conversely, epistemic mistrust may result in inflexible thinking and an inability to learn from the social environment (Fonagy et al., 2017). Selective trust is necessary for children as they are constantly exposed to new information, which is increasingly provided by others unrelated to them, e.g., teachers and peers, in knowledge-based contexts such as preschools (Birch et al., 2008; Chen et al., 2018; Corriveau et al., 2013; Corriveau et al., 2016; Koenig et al., 2004).

In a groundbreaking study, Koenig and colleagues (2004) demonstrated children's ability to track and judge information provided by others across contexts. Children aged 3 to 5 years watched as two agents on video labeled three familiar objects with varying accuracy (e.g., one agent was always right, while the other agent was always wrong). For example, the accurate agent labeled a cup correctly, while the inaccurate agent labeled it as a "shoe." Next, each of these agents labeled a novel object with a different novel pseudo-word (e.g., calling a woven object a "*mef*" or a "*tig*"). Children were asked to verbally state which word provided by the agents they believed to be the correct label for

the novel object. The results suggested that only when children explicitly judged the agents as right or wrong in naming familiar objects did they show selective trust in that they accepted the accurate but not the inaccurate agent's novel word as the label for the novel object. Thus, accuracy enabled children to favor novel information from the agent they deemed a reliable source. Importantly, the link between children's ability to explicitly judge which agent was (in)accurate and their subsequent selective trust of the novel labels provided by the agents further suggests that children use their own knowledge as the basis to make reasonable and rational decisions in epistemic trust (Sobel & Kushnir, 2013).

Researchers have also examined the role of social group membership markers such as language, age, sex, or race in children's epistemic trust decisions, because children are sensitive to these markers from a young age (Kinzler et al., 2011; Shutts et al., 2011). For example, given that the task described above is essentially a word learning one (Koenig et al., 2004), researchers first examined the impact of agents' language groups (e.g., accents) on children's epistemic trust (Corriveau et al., 2013). It was shown that with no information on agents' accuracy, children aged three-to-five years significantly preferred to endorse novel object labels from an agent on video with a native accent, over an agent with a non-native accent. These results suggest that children view native speakers as more reliable sources of information on linguistic labels than agents with foreign accents, and rightly so. Furthermore, when also given accuracy information about the agents with different accents (i.e., one agent always labeled familiar objects accurately or inaccurately, as in Koenig et al., 2004), older children, but not younger children, were more likely to trust the agent with a foreign accent when she was

consistently accurate (Corriveau et al., 2013). This age difference may suggest a developmental achievement in that older children learn to value accuracy over accent in this word learning context. Thus, these findings make clear that the impact of *language group* (e.g., accent) is evident in epistemic trust because this intergroup factor is indicative of someone's competence to teach young children novel information. Similar results have been observed in studies examining the impact of *age*: preschoolers view an adult as more knowledgeable about labels for objects than a peer, unless the peer is shown to be more accurate than the adult (Jaswal & Neely, 2006).

Regarding the impact of another salient intergroup factor, *race*, on epistemic trust, however, the results have been complicated (Chen et al., 2018; Gaither et al., 2014; McDonald & Ma, 2016). For example, Gaither and colleagues (2014) provided evidence that White but not Black children favored same-race over different-race agents in learning objects' functions. However, children's own racial group was made salient by priming, i.e., they finished a coloring task before the learning task. Moreover, Chen and colleagues (2018) found that Hong Kong Chinese children's ingroup racial preferences were confounded with social status. They were more likely to accept information on object functions from same-race agents than Southeast Asian agents, a group of lower status in the region, yet showed no such preference when the comparison was with White agents, a group of higher status. In these two studies that reported race effects on epistemic trust (Chen et al., 2018; Gaither et al., 2014), the agents did not speak and silently operated the objects in demonstration. In another study (McDonald & Ma, 2016) reporting the effect of race on epistemic trust, White monolingual preschoolers were even willing to accept false information (i.e., verbal statements) from same-race and same-

accent agents, but not from different-race and different-accent agents. However, the factors of accent and race (i.e., Asian) were confounded in the study. Thus, it remains unclear when children are not primed to attend to race, how the intergroup factor of race impacts American children's epistemic trust. The present study aimed to fill this gap by keeping constant agents' language groups (i.e., accents) and only varying their race, with no priming, to obtain a better understanding of trust across race.

In summary, the present study sought to investigate how preschoolers make trust decisions as a function of the purpose of the trust (social or epistemic) and of the intergroup factors of race and SES. Age differences were examined given previous findings that 3-year-olds differed from older children where the intergroup factor of accent were considered (Corriveau, et al., 2013), to probe if race would hold similar implications. Three experiments were conducted, the first two focusing on social trust (Experiments 1 and 2) and the last on epistemic trust (Experiment 3). Participants were preschoolers aged three to six. Their SES was determined by maternal educational background, following previous work (Sturge-Apple et al., 2016; Watts et al., 2018). Due to the use of English language across all experiments, children were required to be exposed to English at least 50% of the time to be eligible to participate.

Experiment 1

In this experiment, children were administered the marshmallow task by an unfamiliar agent (same-race or different-race from them). Given the majority White sample in the study, for White participants, same-race agents were White and different-race agents were either Black or Hispanic. We hypothesized that if White children's ingroup racial preference (Dunham et al., 2013; Gaither et al., 2014) would translate to

their social trust, then the White children in our sample would be more trusting of the same-race agent, i.e., having longer wait-times with her, than of the different-race agent. Because of the impact of SES on children's wait times in the marshmallow task (Sturge-Apple et al., 2016), we also predicted that high-SES children would wait longer than low-SES children.

Participants

Forty-eight children between the ages of three- and six-years-old (30 female, M = 3.92 years) participated. One child was tested but excluded because the parent ended the experiment early. Most children (39; 81.3%) were White based on parental reports, 8.3% of children were Hispanic/Latino (n = 4), 8.4% mixed (n = 4), and 2.1% Asian (n = 1). Of the 48 children, 42 (87.5%) were high-SES. Planned sample would fully cross children's race (White or non-White) and SES backgrounds.

All children were recruited from the broader Columbia, Missouri area through preschools (e.g., Columbia Public Schools and the university preschool) and our lab database of parents who expressed interest in participating in developmental research. Children were tested at the Child Development Lab on the University of Missouri campus during school hours or brought to our lab by a parent to participate.

Design and Procedure

Before the experiment began, parents completed a demographic questionnaire on parental education level, household income, parent and child race and ethnicity, and the child's language exposure. For children participating at the Child Development Lab, their

parents completed the consent and demographic forms online before their child participated during school hours.

Half of the participants were randomly assigned to the same-race agent condition and the other half to the different-race condition. White children's same-race agent was always White, while the different-race agent for them was either Black or Hispanic/Latino. For non-White children, their same-race agent identified with at least one of their racial identifiers (e.g., Hispanic for a White/Hispanic mixed-race child), and their different-race agent was always White. Prior to testing, parents were asked to indicate which snack their child preferred among marshmallows, gummy bears, and chocolate. The agent gave the participants this preferred snack and said if they waited for her to come back and did not eat the snack before she returned, she would give them three more. Once the agent left the room, the participant was monitored on camera. The task ended when the participant bit, licked, or ate the snack, or 15 minutes elapsed, and the agent went back to give the participant 3 more preferred snacks.

Videos were recorded and coded offline by two naïve raters who were unaware of the hypotheses. They coded how long the child waited before the child bit, licked, or ate the snack (100% agreement).

Results and Discussion

Mean wait-times per condition (same-race versus different-race) are depicted in Figure 1. Children in the same-race agent condition (n = 24) waited a mean duration of 7 minutes and 46 seconds (M = 466 s). Conversely, children in the different-race agent condition (n = 24) waited a mean duration of 6 minutes and 17 seconds (M = 377 s). A

Wilcoxon rank-sum test confirmed this difference was not significant, $W = 328$, $p > .250$. In addition, in the same-race agent condition, 10 of the 24 children waited the full 15 minutes, while 8 of the 24 children in the different-race agent condition waited all 15 minutes. A chi-square test revealed that there was no significant difference between the two conditions, $\chi^2(1, 48) = .356$, $p > .250$.

Focusing on children's race, of the 39 White children, their mean wait times were 510 s ($n = 20$, same-race agent) and 363 s ($n = 19$, different-race agent), respectively, $W = 240$, $p = .151$. The numbers of children who waited the full 15 minutes were not different between the two conditions (9 in the same-race and 6 in the different-race agent condition), $\chi^2(1, 39) = .742$, $p > .250$. Therefore, White children in Columbia MO do not seem to be affected by the agent's race in their wait times of the marshmallow task.

Of the 9 non-White children, their mean wait times were 226 s for the same-race agent ($n = 4$) and 434 s for the different-race agent. If this difference became significant with a full sample, this would point to the impact of agent race on these non-White children's performance in the marshmallow task. Interestingly, given that the 4 children who interacted with the same-race agent were of mixed race themselves, it would suggest that these children might be comfortable with an agent who matches one of their racial groups (Black or Hispanic) and hence decide to eat the snack, a proposal recently put forth by Pierre and colleagues (2023).

Regarding SES, 42 children were high-SES (mean wait time = 385 s) and only 6 were low-SES (mean wait time = 685 s). It thus remains to be seen if the effect of SES would manifest in a full sample in that low-SES children's wait time would drop to be

significantly lower than that of high-SES children, consistent with previous research (Sturge-Apple et al., 2016).

Finally, an interesting pattern of results regarding age emerged (see Fig. 2). Three-year-old participants (n = 16), regardless of their race and SES, waited an average of 429 s with the same-race agent (n = 7), as opposed to 150 s with the different-race agent, whereas participants aged four-years and older (n = 32) waited an average of 482 s with the same-race agent (n = 18) and an average of 514 s with the different-race agent. If the effect of race became significant in 3-year-olds with a full sample, this would suggest that these younger children are less trusting of the promises made by different-race others in the marshmallow task.

Therefore, in Experiment 1, children did not wait different lengths of time in the marshmallow task when the agent was of the same or a different racial group from them. Similar results were found for the White children (81.3%) in the group. We reasoned that in the marshmallow task, children's wait time may result from factors beyond the agent's race, especially children's self-control skills (Watts et al., 2018), which is not the focus of the present study. Therefore, in the next experiment, we designed a new task to examine the effect of race on children's social trust, which did not place much demand on their self-control skills.

Experiment 2

To further examine social trust decisions, this experiment used a forced-choice task to investigate if children considered an agent's race when asking her to provide support, e.g., protect their creation. In the experiment, children first built a tower with an experimenter who demonstrated how precarious the tower was by "accidentally"

knocking it over. Upon rebuilding, the experimenter told the child it was time for a new game, but they could return to their tower later and play more. She then left the room and returned shortly with two new agents (same- and different-race). Children were asked to choose one agent to watch their newly constructed tower, while they were gone. Again, if White children considered the agent's race in their choices, they would be more likely to choose the same-race over the different-race agent.

Participants

Thirty-seven children between the ages of three- and six-years-old (24 female, *M* = 3.89 years) participated. All these children also participated in Experiment 1 in a different testing session with at least one week between the two testing sessions to avoid priming (Gaither et al., 2014) and order counterbalanced. Most children (n = 32) were White (86.5%), while 10.8% (n = 4) were Hispanic/Latino, and 2.7% (n = 1) was mixed, based on parental reports. Finally, 86.5% of children (n = 32) were high-SES.

Design and Procedure

Participants sat at a table with an experimenter who assisted them in building a tower using the Marble Run game. After the tower was almost complete, as judged by the experimenter, she (unbeknownst to the participant) moved the table to knock down the tower. The experimenter said, "Oh no!" and explained to the participant they would need to be careful not to knock the tower over again. When the tower was rebuilt, the experimenter explained they would need to start their next game in a different room but could return to play with the tower after. They then explained, "Do you remember when the tower fell? We do not want that to happen again. I know! I have friends who can

watch the tower for us. I will go get them." The experimenter left the room and returned shortly with two new agents, different from the agent in Experiment 1 with the participant. After the experimenter said, "Here they are!" the two agents smiled and waved but did not speak. One agent was the same race as the participant, and the other was a different race (the decisions based on race were identical to those of Experiment 1). With the agents' hands back at their sides, their gaze averted from the child, and with neutral expressions, the experimenter asked the child to choose one agent to watch their tower. Participants were asked to point to one agent. After choosing, the experimenter and the participant left the room to begin the learning task. Test sessions were video recorded and coded offline by two naive coders to see if they chose the same-race or the different-race agent. They had perfect agreement.

Results and Discussion

Of the 37 participants, 24 (65%) chose the same-race agent (see Fig. 3), marginally significantly different from chance (two-tailed $p = .099$, sign test). Focusing on children's race, the 32 White children chose the same-race agent 62.5% (20 of 32) of the time, not different from chance (two-tailed $p = .215$). In addition, 80% (4 of 5) of the non-White children chose the same-race agent. If significance was achieved with a full balanced sample, this would suggest that children may be generally more trusting of same-race others.

Of the 32 high-SES children, 22 (68.8%) chose the same-race agent, significantly different from chance, two-tailed $p = .050$. However, this significance is confounded with age (see below). Only two of the 5 Low-SES children chose the same-race agent.

Focusing on age (see Fig. 4), 5/11 of the three-year-olds (45.5%) chose the same-race agent, while older children (18 of 26; 69.2%) chose the same-race agent, again marginally significantly different from chance (two-tailed $p = .076$). These differences are the opposite of those in Experiment 1. If these differences held with a full sample, it would suggest that in a social situation in which children need to trust an unfamiliar person to provide help, older children might consider race to make decisions.

In sum, in Experiment 2, children tended to choose the same-race over the different-race agent, especially those older than age 3. Although, this trend became significant in high-SES children, while SES confounded with age because 24 of the 26 older children were high-SES. If results still held with a full sample, this would elucidate the impact of children's age or SES on their tendency of using race to make social trust judgments.

The next, Experiment 3 examined how race might impact a different type of trust (epistemic trust).

Experiment 3

This experiment probed how race might impact children's epistemic trust judgments. First, children participated in *learning* trials where they were asked to endorse one novel object label provided by two unfamiliar agents on video (same-race and different-race), based on Corriveau et al. (2013). With the agents' language group equated, we hypothesized that children should not consider race as being indicative of their epistemic states, and thus choose the agents' labels equally. Next, children completed similar trials with accuracy information added, based on Koenig et al. (2004).

Before labeling a novel object, two agents (same- and different-race) labeled three familiar objects correctly or incorrectly (i.e., calling a "cup" a "cup" versus calling a "cup" a "ball"). We predicted that if children valued accuracy over race, then they should endorse the accurate agent's label more often. To align with Experiments 1 and 2, we further examined the impact of child age and SES on participants' epistemic trust decisions. As discussed earlier, younger and older preschoolers responded differently when accent was pitted against accuracy (Corriveau et al., 2013) in similar learning tasks. It was an open question whether younger and older preschoolers would respond differently in the present study. With regards to SES, to our knowledge, only one study has examined the impact of SES on epistemic trust, which found that high-SES children preferred to learn novel labels from agents using complex syntax (Corriveau et al., 2016). However, low-SES children adopted the same preferences after a book-reading intervention (Leech et al., 2019). Given that no complex syntax was involved in the present study, we did not expect any impact of SES.

Participants

The same 37 children participated in Experiment 3 after Experiment 2 in one testing session. However, two children's data were excluded due to equipment failure and one refused to continue after Experiment 2, resulting in a final sample of thirty-four children. Of these 34 children (23 female, M = 3.91 years old), most (n = 29) were White (85.3%), while 11.8% (n = 4) were Hispanic/Latino, and 2.9% (n = 1) were multiracial. Finally, 85.3% of children (n = 29) were high-SES.

Design and Procedure

Participants sat at a computer with the same experimenter with whom they built the Marble Run tower in Experiment 2. Each participant received 4 learning trials and 4 accuracy trials. In each learning trial, participants watched a slideshow (see Fig. 5) of a same-race and a different-race adult (i.e., pairs of White and Black agents, or pairs of White and Hispanic/Latino agents) on each side of the screen with a novel object in front of them. Counterbalanced across trials were side of same-race agent (left or right), which agent spoke first, and the gender of the pairs (both male or female). Each agent labeled the object with a different pseudo word (e.g., "this is a *tig*" versus "this is a *mef"*). The experimenter then repeated the labels given by the agents and asked the participant which label *they* thought the object was called. Participants could provide a verbal response or point at the agent.

Next, participants receive four accuracy trials (see Fig. 5) to assess whether children valued the agents' accuracy over their race. To begin, participants were shown the familiar objects and asked to label them. They all knew the words for these familiar objects. In each trial, before naming a novel object, the two agents also provided labels for three familiar objects. One was always right and one always wrong. When children were asked which agent was right or wrong, they were all correct. As in learning trials, for the novel object, children were asked which agent's label they endorsed. In total, children saw 8 pairs of agents on video in Experiment 3.

Test sessions were video-recorded and coded offline by two naïve raters to calculate reliability (100% agreement). In the learning trials, participants received a score of 0 for endorsing the same-race agent's label but 1 for endorsing the different-race agent's label. In the accuracy trials, participants received a score of 1 for endorsing the

accurate agent's label, regardless of his or her race, but 0 for endorsing the inaccurate agent's label.

Results and Discussion

Results from the 34 participants (see Fig. 6) show that in the learning trials, participants' endorsement of the same-race agents' labels across trials was not different from chance (M = .46, SD = .25), $t(33) = .867$, two-tailed $p > .250$. This suggests that children did not consider race as indicative of the agents' epistemic state when the agent's race differed but with their language group equated. In the accuracy trials, participants endorsed the accurate agents' novel object labels significantly more than chance (M = .84, SD = .16), $t(33) = 12.215$, two-tailed $p < .0001$. Thus, children trusted others' prior accuracy, regardless of their race, in learning new labels for novel objects from them.

Focusing on children's race, with the 29 White children, in the learning trials, their endorsement of the same-race agents' labels was not different from chance (M = .46, SD = .25), $t(28) = .926$, two-tailed $p > .250$. In the accuracy trials, they were significantly more likely to endorse the accurate agents' labels (M = .83, SD = .17), $t(28) = 10.687$, two-tailed $p < .0001$. Non-White children (n = 5) responded similarly (learning trials, M = .50; accuracy trials, M = .90).

Regarding SES, high-SES participants (n = 29) again chose equally between the agents in the learning trials (M = .47, SD = .26), $t(28) = .724$, two-tailed $p > .250$, but they were significantly more likely to endorse the accurate agents' labels in the accuracy

trials (M = .84, SD = .17), $t(28) = 10.974$, two-tailed $p < .0001$. Low-SES participants (n = 5) responded similarly (learning trials, M = .50; accuracy trials, M = .90).

When examining age (see Fig. 7), 3-year-olds (n = 9) again chose equally between the agents in the learning trials (M = .57) and endorse the accurate agents' labels in the accuracy trials (M = .79). Older children (n = 25) responded similarly (learning trials, M = .42, SD = .27, $t(24) = 1.496$, two-tailed p = .148; accuracy trials, M = .85, SD = .16, $t(24) = 10.844$, $p < .0001$).

The results of Experiment 3 showed that children viewed accuracy as indicative of agents' knowledge levels, regardless of the agent's race. In the absence of accuracy information, children chose novel labels provided by same- and different-race agents equally. These results were found across children of different races, SES backgrounds, and age. If they still held with a fully balanced sample, it would provide evidence for our predictions that in epistemic trust, children value others' accuracy but not race.

General Discussion

The present study aimed to probe children's trust as a function of race, SES and age across social and epistemic trust. The results revealed that in social trust, children's decisions to trust others across race differ by the task. In Experiment 1, participants were administered the marshmallow task by a same- or different-race agent. There was no significant effect of the agent's race on participant's wait times. In Experiment 2, participants built a precarious tower with an experimenter. When complete, the experimenter asked the participant to choose between two agents, same- and different-race, to watch their tower while they left the room for another task. Results revealed that

participants, especially those aged 4-years and older, were more likely to choose the same-race agent, with marginal significance. Further, high-SES participants were significantly more likely to choose the same-race agent. A fully balanced sample would allow for further examination of the effects of age, children's race (White or non-White), and SES on the results. Additionally, the agents in these two experiments were all female college students varying on race (White vs. Black or Hispanic). Because the goal was for the participant to complete Experiment 2 and then Experiment 3, to minimize any influence between experiments, we did not ask participants their justification for their choice in Experiment 2. In future work, this can be added to examine whether children base their choice in addition to the agents' race, such as perceived niceness.

Here, we discuss how participant's considerations of race as indicative of one's trustworthiness might vary between the two experiments. In Experiment 1, it is possible that participants weighed their options and formed their decision to (not) wait based on the promise of reward, reflecting self-regulation differences (e.g., Michaelson & Munakata, 2016; Watts et al., 2018), more than the race of the agent. In addition, the participants interacted briefly with the agent during the instructions of the task. By contrast, in Experiment 2, the two agents did not talk to the participants, and the participants had to make a quick decision on whom to trust their tower with, which might be a more inducive situation for children to rely on race to inform their decision, similar to previous reports on White children's robust same-race preferences when they are asked to pick between pictures of two agents whom they would like to play and share with (Gaither et al., 2014). The different results of the two experiments thus point to the possibility that the effect of race might emerge only when children need to make quick

decisions about other people based on salient factors such as race, but not in all social situations. This is consistent with results obtained with adults in that while they can rapidly form first impressions and judge others, e.g., from faces, based on factors such as race (e.g., Todorov et al., 2015), social situations with involved interactions can reduce racial preferences and biases, at least to some extent (e.g., Shook & Fazio, 2008).

In Experiment 3 on epistemic trust, results indicate that participants chose randomly when the two agents, same- or different-race, provided novel labels. They were also significantly more likely to accept novel labels based on the demonstrated accuracy of two agents differing on race. These findings are consistent with previous work demonstrating that children selectively trust accurate agents (Koenig et al., 2004). Children also reasonably decided not to consider others' race in learning, possibly because this factor is not indicative of agents' knowledge level. In a previous study (Corriveau et al., 2013), 3-year-olds, but not older children, selectively preferred to accept object labels from native English speakers, rather than non-native English speakers, even with accuracy information provided. In the present research, no such age difference was found, although the sample size was smaller in 3-year-olds than in older children. One possible reason is that in a word-learning context, younger, but not older children, could have struggled to separate accuracy and accent when they were tasked to learning a novel label from a non-native English speaker. In our experiment, participants learned novel labels from native English-speaking agents, with accent equated and matched to their region (i.e., the Midwest), which might have made it easier for them to focus on accuracy information in their selective trust.

Further, a recent study (Hwang & Markson, 2023) with children in St. Louis, MO found that White and Black children endorse White agents more often in learning trials. In accuracy trials, while there was an overall preference for accurate agents, similar to the present results, the effects were complicated by child race and racial diversity of their schools and neighborhoods. The present sample was of mostly White, high-SES children in Columbia, MO, a racially more homogenous context than St. Louis, MO. The differences in results thus highlight the importance of examining children's race and local contexts in future epistemic trust work.

Future Directions

While the present study provides initial evidence of children's choices between same- and different-race agents, the results were unclear mainly because it was under power to examine participants' race. However, collaborative work with two research labs in different locations of the country is ongoing to address this issue.

In addition, in Experiment 1, to zoom in on children's self-control when varying the experimenter's race in a marshmallow task, it might be informative to include additional measures of self-control (i.e., inhibition and cognitive flexibility tasks) to examine whether it had a moderating effect on the currently null results.

Finally, while the present research investigated social and epistemic trust separately, we propose future work should consider links between the two. One possible link between social and epistemic trust may be the interpersonal trust young children build with familiar people with whom they have close relationships (e.g., parents). Social trust is, in essence, this type of trust generalized to unfamiliar agents. For instance, depending on

how much young children trust their parents, they may emulate how their parents behave when interacting with same-race and different-race others. Epistemic trust also has its connections to parent-child relationships. For example, children's trust in claims made by their mother or a stranger is related to the quality of the mother-infant attachment (Corriveau et al., 2009). Focusing on the pattern of results regarding the effect of race, examining parent-child relationships, or parents' own racial attitudes, can be fruitful to elucidate how children acquire race-based choices in social situations such as the one used in Experiment 2, but not during learning.

Conclusion

To conclude, the present research provides initial insight into children's same- and different-race considerations within two types of trust – social and epistemic. While White and high-SES children were more likely to choose same-race others to provide assistance, this preference did not impact their wait times in the marshmallow task. Further, children did not consider race when learning novel labels from others. Future work is necessary to unpack children's trust across race. For instance, a fully balanced sample of racial groups, SES, and age would allow for a better understanding of the effects of racial identity, environmental diversity, and local context on children's trust judgements.

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Figure 1

Mean wait-times of children in each condition of Experiment 1. Error bars show 95% confidence intervals.

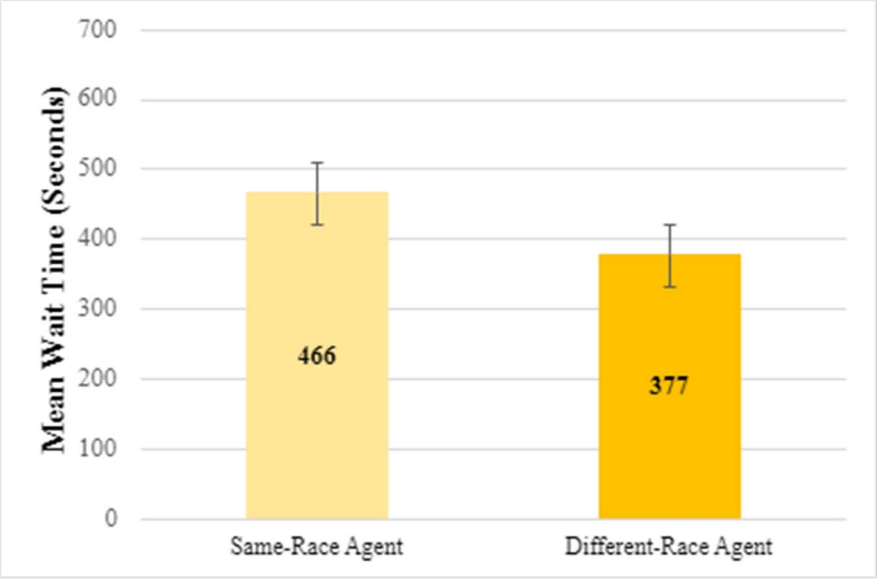

Figure 2

Mean wait-times of children in each condition of Experiment 1, grouped by age. Error bars show 95% confidence intervals.

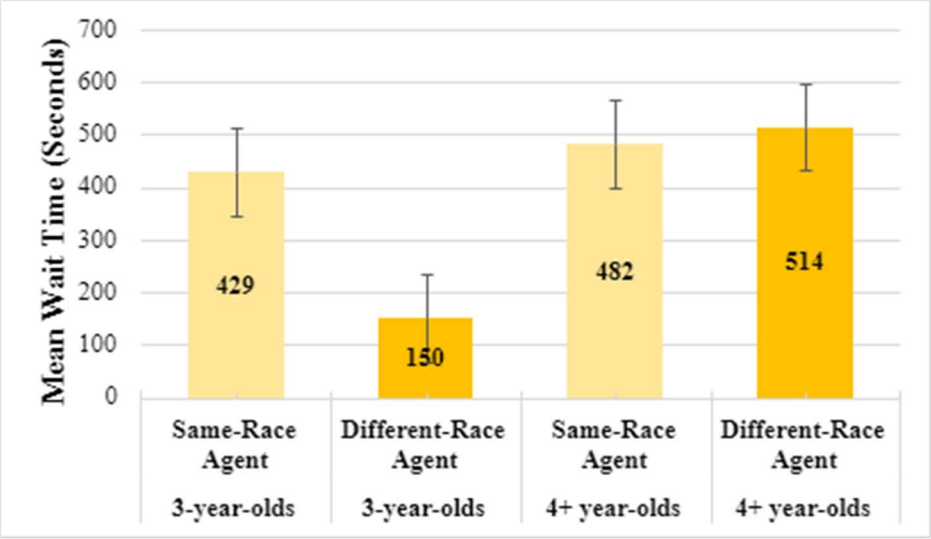

Figure 3

Average proportions of children choosing the same-race or different-race agent in Experiment 2.

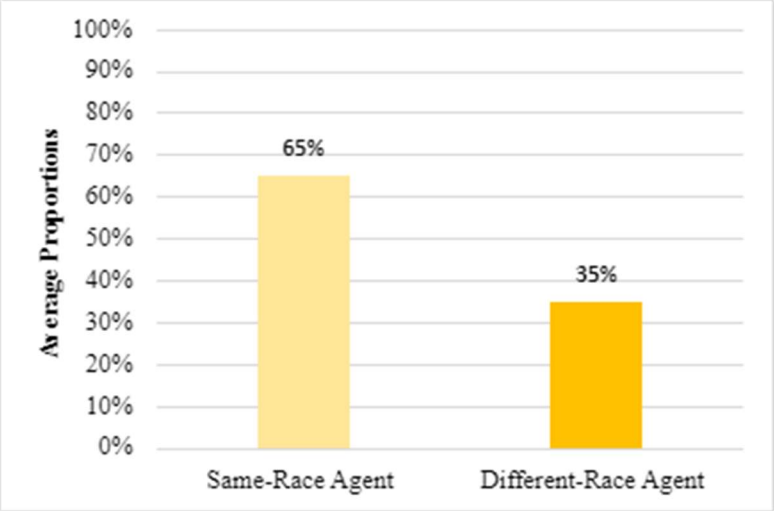

Figure 4

Average proportions of children choosing the same-race agent in Experiment 2, grouped by age.

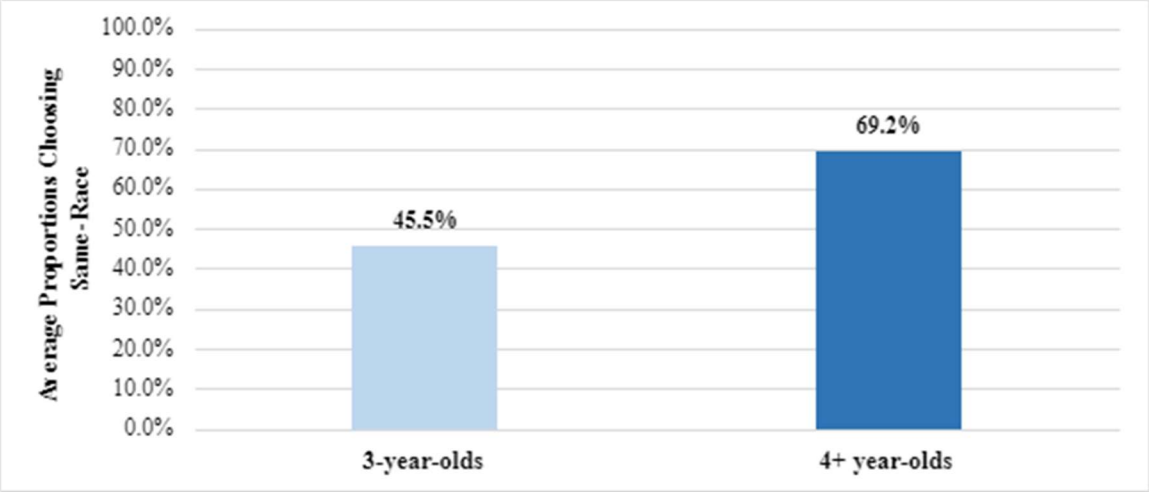

Figure 5

Examples of the learning and accuracy trials in Experiment 3.

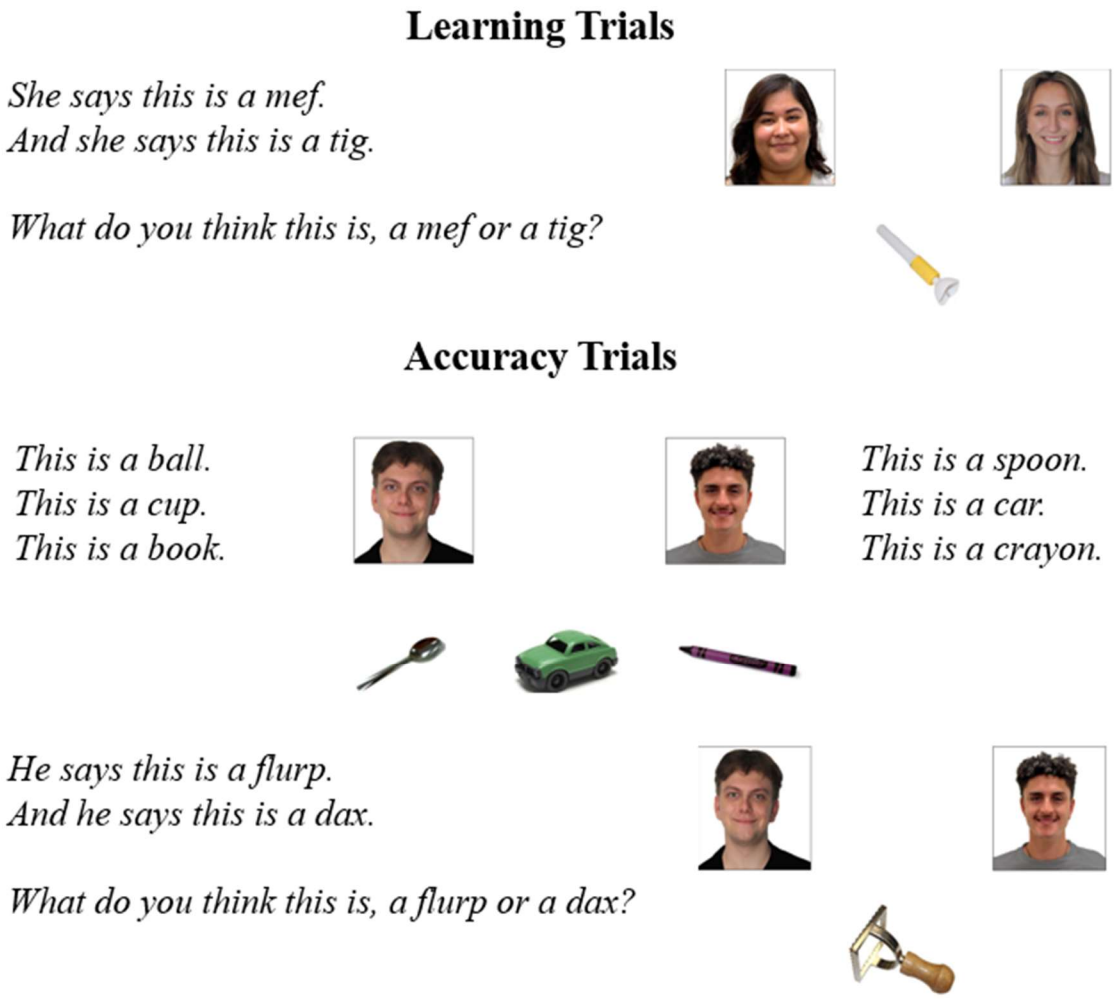

Figure 6

Average scores across the learning and the accuracy trials in Experiment 3.

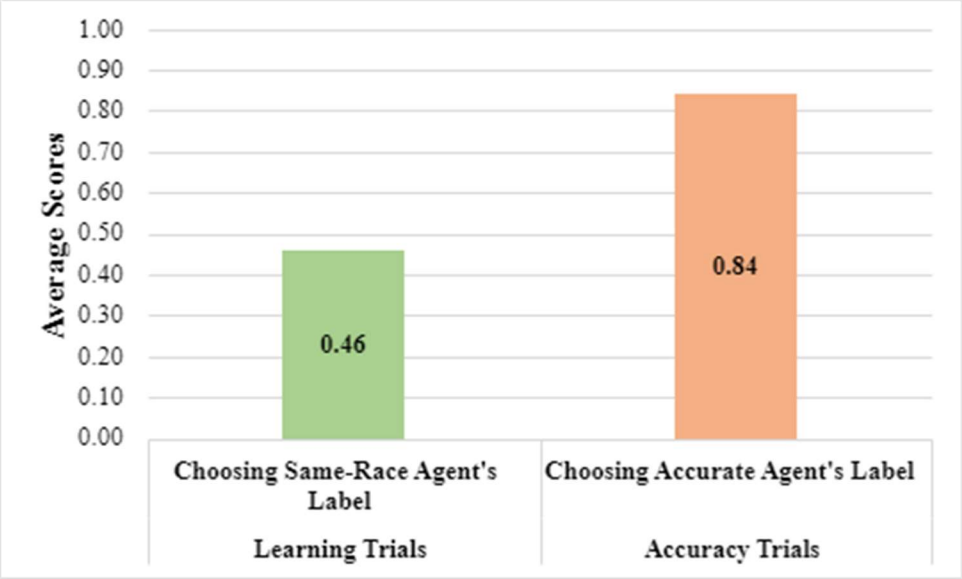

Figure 7

Average scores across the learning and accuracy trials in Experiment 3, grouped by age.