

Gender and Race as Guides for Children's Expectations of Intergroup Behavior

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Abstract

As children grow up, they develop theories of social categories that guide them and shape their understanding of what it means to be part of a group. Past work has demonstrated that young children hold different expectations for how group members will interact with one another versus how they will interact with outgroup members. The present study extends this literature by investigating the extent to which children use race and gender to predict mean behaviors, nice behaviors, friendship patterns, and similarity. Children aged 3 to 7 years participated through Lookit, an online platform for developmental research. They were presented with images of an agent, an ingroup member, and an outgroup member, and were then asked to select the person whom the agent would direct an action toward. Children held different expectations of social interactions depending on behavior type and whether they were reasoning about race or gender. Effects of participant gender and race were analyzed but should be considered carefully due to small sample size. This study advanced prior work by including race and gender categories, four interaction types, children from a broad range of backgrounds, and the use of Lookit as the research platform. It also identified discrepancies between children's abstract theories of social categorization, as shown in novel groups studies, and their real-world social cognition. Finally, the impact of children's race and gender is examined, establishing that these factors must be considered in this field of research. Limitations and recommendations for future studies are discussed.

Gender and Race as Guides for Children's Expectations of Intergroup Behavior

At the beginning of their lives, children join the complex social world, and very quickly begin to make sense of their surroundings by organizing their social environments. By forming social categories and discovering the ones to which they belong, children are better able to understand and predict behaviors. Using social groups in this way helps children navigate their environment, but also can lead to the formation of biases, stereotypes, and prejudice (Bigler & Liben, 2007). It is therefore critical that we broaden our understanding of the environmental factors that lead children to view people as members of a social group. Bigler and Liben's developmental intergroup theory suggests four contributing factors: perceptual discriminability (visually distinct appearances, e.g., skin color), proportional group size (smaller groups being more distinctive), use of explicit labeling, and implicit use of groups (children observe social divisions and infer their salience). All of these factors, combined with the input that they receive from parents, teachers, and the social interactions that they observe, lead children to develop conceptualizations of social categories. The nature of these social categories, as well as their implications, continues to be investigated as a growing field of research.

Rhodes (2013) proposed that there are two theories, which can operate in tandem, by which children use social categorization to make sense of the world. The first theory, initially documented by Hirschfeld (1996), leads children to view social categories as natural kinds. That is, like they do with animal categories, children view social categories as being stable, determined from birth, and predictive of other characteristics. The perception of social categories as natural kinds results from psychological essentialism, the notion that category members have an internal, unobservable "essence" that gives rise to their observable properties (Gelman, 2003, 2004). This theory of social categories as natural kinds can be useful as children attempt to make

sense of the social world because it enables them to make important inferences regarding new category members. For example, children infer that members of a social group will share psychological properties, such as liking to play a novel game, even if there are personality differences amongst the group members (Diesendruck & haLevi, 2006).

One significant social category to which children apply their theory of natural kinds is gender. For example, at age 5, children assume that a baby will grow up to share the physical and behavioral properties of their birth gender, even when that baby was raised solely by members of the opposite sex (Taylor et al., 2009). Preschool age children also understand that labeling a person as a girl or a boy is a strong predictor of shared properties despite differences in appearance (Gelman et al., 1986). Yet, while young children treat gender categories as natural kinds very early in life, they do not do so as early for other social categories, such as race (Rhodes & Gelman, 2009). Children begin to essentialize race at around 5-6 years old (Giménez & Harris, 2002), and this essentialist thinking, combined with the salience of race in American children's broader environment, contributes to racial stereotyping (Pauker et al., 2010). Thus, although they are treated differently, gender and race are two social categories which children seem to essentialize. They encounter members of these groups and quickly infer their characteristics.

However, essentialist reasoning cannot characterize all of children's beliefs about social categories. Children also appear to hold a second theory, by which they view these categories as markers of obligation (Rhodes, 2013). That is, children believe that members of a category have certain obligations towards one another. This theory allows children to make inferences about how group members will interact. For example, children infer that girls will be friends with other girls, while boys will be friends with other boys (Shutts et al., 2013). This theory operates even

when children have received very little input to support it. In minimal groups studies, which involve novel, arbitrary groups and can assess children's *abstract* beliefs independent of any pre-existing biases that they hold, children form strong expectations about what group members are like (Bigler et al., 1997; Dunham et al., 2011; Patterson and Bigler, 2006). Specifically, when children are presented with a new category, they quickly assume that there are social obligations that come along with that category. Rhodes and Chalik (2013) documented this theory in a study in which they introduced children aged 3-9 years to two novel groups of people, the Flurps and the Zazzes. They found that children considered within-group harm wrong whether or not there existed explicit rules against it. For example, children were told that a Zazz teased another Zazz, and they rated this action equally as harsh both before and after hearing that the Zazzes' school allowed teasing. However, when told that a Zazz teased a Flurp, children's evaluations became less harsh after hearing that this action was not against school rules. Children therefore perceived between-group harm as wrong only in the context of explicit rules prohibiting it. Thus, it appears that children view social categories as markers of an obligation not to harm—specifically, that group members are obligated to avoid harming one another, but do not hold this obligation toward members of other groups.

To understand which behaviors will be seen as constrained by group membership, Chalik and Dunham (2020) investigated the role of morality as a potential predictor of 4- to 5-year-old children's social category-based inferences. Novel behaviors were introduced to children which were described as either positive or negative, and either moral or nonmoral. For example, in a first study, moral behaviors were defined as being authority-independent (i.e., obligated or prohibited regardless of the teacher's rules), while nonmoral behaviors were defined as being authority-dependent (i.e., obligated or prohibited depending on the teacher's rules). In a second

study, moral behaviors were defined as being location-independent (i.e., obligated or prohibited whether at home or at school), while nonmoral behaviors were defined as location-dependent (i.e., obligated or prohibited depending on whether it occurred at home or at school). Children were then introduced to novel groups, the Flurps and the Zazzes, and made predictions about how the novel behaviors would play out. When they had been explained in a morally-relevant way, children predicted that positive behaviors would be directed toward ingroup members, and that negative behaviors would be directed toward outgroup members. But, they did not hold such predictions for nonmoral behaviors, regardless of whether they were positive or negative. These findings demonstrate that children view social categories as marking people who are morally obligated to one another, such that when they learn about new moral behaviors, they spontaneously assume that these behaviors will play out depending on group membership.

Children's theories about social categories grow and change across development. In a series of studies by Rhodes (2012), 3- to 5-year-old children were asked questions about novel groups, again the Flurps and the Zazzes. They were asked about six harmful behaviors, such as, 'who did a Flurp steal from?', or six helpful behaviors, such as, 'who did a Flurp share with?' Without any prior experience with these social groups, children, when predicting harmful behaviors, expected that members of a group would refrain from harming ingroup members and instead would direct harm toward outgroup members. Children also referenced social categories in their explanations of these responses, explaining that people would direct harm toward outgroup members *because* of category membership. However, for helpful behaviors, no effects were found among 3- to 5-year-olds, but a study including 5- to 10-year-old children did determine that children begin to expect within-group helping around age 6. Thus, it appears that

developmentally, children hold expectations of negative between-group interactions prior to forming expectations of positive within-group interactions.

Thus, young children clearly hold a strong belief that social categories constrain both helping and harming behaviors. Research has also asked whether children see social categories as groups of people who hold more broad obligations towards each other, such as to protect and affiliate with one another. Chalik and Rhodes (2018) explored this question utilizing a novel groups design. The members of each group, again called the Flurps and the Zazzes, were described as working with their groups to build block towers. Then, 3- to 4-year-old children were asked to predict the recipient of either harmful or prosocial behaviors, as well as who an agent would be friends with and who an agent would save from harm. Children made the most within-group predictions for friendship, and the fewest within-group predictions for harmful behaviors. However, no effect was found for prosocial behaviors, in line with previous work with this age group (Rhodes, 2012). Additionally, 4-year-old children made more within-group predictions for saving, while 3-year-old children did not differ from chance when predicting saving behaviors. These findings support the proposal that children view social categories as marking people who are obligated to each other in more ways than simply refraining from harm.

A similar novel groups design was recently used for a study conducted online through Lookit, a new online platform for developmental research (Scott & Schulz, 2017). In this study by Chalik and Dunham (unpublished), children aged 3-7 years were shown a target character and were asked to choose whom that character would direct nice and mean behaviors toward, as well as whom they would be friends with. Children were also asked who would share novel properties with the target character. In line with prior research, younger children predicted between-group harm and within-group friendship but did not have expectations about how prosocial behaviors

would play out. Older children similarly predicted between-group harm and within-group friendship, as well as within-group prosocial behaviors. Furthermore, all children, except for the 3-year-old group, expected properties to be shared within groups, and this tendency increased with age. In addition to providing insight into the development of children's beliefs about shared properties among category members, these findings corroborate previous work as well as establish Lookit as a reliable platform for this field of research.

All of the novel and minimal group studies described here have been necessary to elucidate the ways in which children relate to and understand social categories as theoretical concepts, without the introduction of various factors such as differences in experience, exposure, or upbringing. But the real world introduces new considerations that children's theory of novel groups may not account for. For example, in a study by Misch and colleagues (2021), children were assigned to minimal groups, marked by different colored scarves, and were told that they would be playing a game online with fellow group members. Following group assignment, children quickly developed an ingroup bias. Then, in the experimental condition, children saw an animation on an iPad showing that the internet connection with their ingroup had been unsuccessful, and they were told that they would instead be playing with members of their outgroup. This anticipation of between-group cooperation mitigated their intergroup bias. However, when children were assigned to groups by gender in another study using the same general paradigm, the anticipation of between-group cooperation did not reduce children's ingroup bias. In addition to documenting the strength of children's beliefs about gender groups, these findings highlight that there is often a disparity between studies using minimal groups and those using real-world social groups. Thus, while novel and minimal group designs serve to demonstrate children's abstract understanding of social categories, it remains of primary

importance to test how these theories are invoked in the presence of real social categories to which children belong and to which children are exposed in their everyday lives.

In a series of experiments intended to test these issues, Shutts and colleagues (2013) examined how children's theories about social categories extend to gender and race. Three-year-old children used gender, but not race, to guide their own choices of who to be friends with and their expectations about who would share their preferences. However, they did not yet use either of these social categories as guides when it came to third-person inferences. Meanwhile, 4-year-old children made third-person inferences about friendship based on both gender and race (expecting that people would be friends with same-race and same-gender individuals), but they did not assume that fellow group members would share psychological properties. These findings revealed that gender, as opposed to race, is a much stronger guide for children's social preferences. Additionally, they showed that children develop first-person reasoning about social categories prior to third-person reasoning, and that reasoning about friendship develops prior to reasoning about shared properties.

Yet, more extensive research using real categories is required to further clarify children's theories regarding social groups. While Shutts and colleagues (2013) examined children's theories of social categorization involving race and gender, those studies focused solely on White 3- to 4-year-old children, and additionally only tested children's beliefs about friendship and shared properties. The present research serves to build upon this prior work and broaden our understanding of how young children's theories guide their behavioral predictions for race and gender groups. By including children aged 3 to 7 years, we aim to explore the developmental trajectories of children's beliefs about these salient social categories. Also, the present study includes children of various racial backgrounds, in order to establish a more inclusive and

comprehensive understanding of how children from various backgrounds think about social groups. Finally, in addition to the friendship and shared property inferences studied previously with regard to race and gender (Shutts et al., 2013), the present study includes conditions that ask about nice and mean behaviors. By using these four conditions (friendship, shared properties, nice behaviors, mean behaviors), we follow up on previous research and explore children's beliefs about the real-world social categories of race and gender.

Methods

Participants

Participants included children ages 3-7 years ($N = 321$). Twelve participants were excluded due to failure to begin or complete the study ($n = 11$) and video malfunction ($n = 1$), for a final sample of 309 children (163 female, 146 male). Of these children, 56 were 3-years-old (36 female, 20 male), 53 were 4-years-old (27 female, 26 male), 48 were 5-years-old (24 female, 24 male), 99 were 6-years-old (53 female, 46 male), and 53 were 7-years-old (23 female, 30 male). Children were of diverse racial backgrounds (64% White, 19.4% Mixed, 8.4% Asian, 3.2% Black, 2% other, and 3% not reported). All children completed the study through Lookit, an online platform for developmental research (Scott & Schulz, 2017), on their home computers with parental supervision and consent.

Procedure

Parental Instructions

Participants completed the study in their web browser. On the Lookit website, parents were informed that the study, titled 'Thinking About Friendship,' would take approximately five to ten minutes and that they would receive \$5 in compensation for each participating child. The study description read, "A study where children predict behavior." In an overview, parents were

then given the following information: “Please sit with your child in a position that is comfortable for both of you. Your child can sit in your lap, or you can sit next to each other – as long as you can both see the screen and your child’s face and torso are visible to the camera. There will be an introductory story, followed by a series of questions for your child to answer. Some of the questions might be about children doing mean things (e.g., hitting), and some of them might be about children doing nice things (e.g., sharing). Some of them will be completely neutral. For each question, you and your child will see some pictures and hear the question, then your child should answer – they can do this by clicking their choice, or by telling you their choice and having you click for them. You can click through to the next question after your child has answered. If you need to exit the study early for any reason, just close the browser window or hit F1.” On the next page, parents were told the following information: “Remember: There are no wrong answers! We’re interested in how children think about these questions, which may be different from how adults think about them. We’ll need your help! It’s important not to ‘give away’ any of your own thoughts about the answers. So avoid discussing the stories or characters, and respond neutrally when your child answers each question – you can say ‘Okay!’, but not ‘That’s right!’ or ‘Hmm, are you sure?’ It’s natural to want to interact about the story and questions, especially when it comes to discussing whether the kids in the story are being nice or mean – that’s good parenting! Please just hold discussion until the end of the study so we can be sure we’re measuring your child’s own beliefs. If your child gets distracted for a bit, that’s fine – please just encourage them to keep watching and listening. If your child doesn’t answer a question right away, you can encourage them to answer - just don’t tell them what you think the answer is. You can also replay the question with the ‘Replay’ button.” Following these instructions, parents clicked on a ‘Start the Study’ button. Throughout the study, at the bottom of

the screen was a reminder to the parents which read, “Parents! If your child can click on their own, let them click one of the answer choices, then click the Next button. If they can’t click on their own, you can click for them. We’re interested in what your child thinks without your help, so please don’t give them any hints or feedback!”

Experiment

Children first completed a practice trial to ensure that they understood how to answer the questions. The practice trial began with a blank screen and an audio recording of a female voice that said, “We’re going to answer some questions. Your job is to listen to the questions, then click your answer. Let’s try it!” Three images then appeared on the screen: a dog centered on the upper half of the page (the agent), another dog on the lower left (the ingroup member), and a cat on the lower right (the outgroup member). Children were then told, “Look at this picture (agent dog picture outlined). Now look at these two other pictures (both lower pictures outlined). Which of these pictures (lower pictures outlined) is the same animal as this picture (agent dog picture outlined)?” Children indicated their answer by clicking on one of the lower images. If they clicked on the cat, the recording said, “Hmm, that picture is a cat. Can you try again? Can you find the picture of a dog?” Once children responded correctly, the recording said, “Great job, now let’s get started.”

Following the practice trial, an image of a school appeared on screen, and the recording said, “Here is a school. Lots of kids go to this school. We’re going to answer some questions about some things the kids do.” Children were then given six test trials, according to their experimental condition. Children were randomly assigned to either a race or gender condition, and to one of four behavior-type conditions: mean behavior, nice behavior, friendship, or similarity. These two independent variables were crossed to create 8 distinct conditions. Similar

to the practice trial, for each test trial, an agent was positioned in the top-center of the screen, and the two possible answer choices were in the bottom corners of the screen. Figure 1 shows two examples of mean behavior trials, one for the race condition, and one for the gender condition.

The following list provides a sample prompt for each behavior type:

1. Mean Behavior: Here is Alex. Alex stole a cookie from somebody. Who did Alex steal a cookie from? Did Alex steal a cookie from this kid? Or did Alex steal a cookie from this kid?
2. Nice Behavior: Here is Casey. Casey shared a toy with somebody. Who did Casey share a toy with? Did Casey share a toy with this kid? Or did Casey share a toy with this kid?
3. Friendship: Here is Sam. Sam is having a birthday party today with all Sam's friends. Here are two other kids. Which of these kids is friends with Sam? Is this kid friends with Sam? Or is this kid friends with Sam?
4. Similarity: Here is Jaime. Jaime eats a kind of food called jimjam. Here are two other kids. Which of these kids also eats jimjam? Does this kid eat jimjam? Or does this kid eat jimjam?

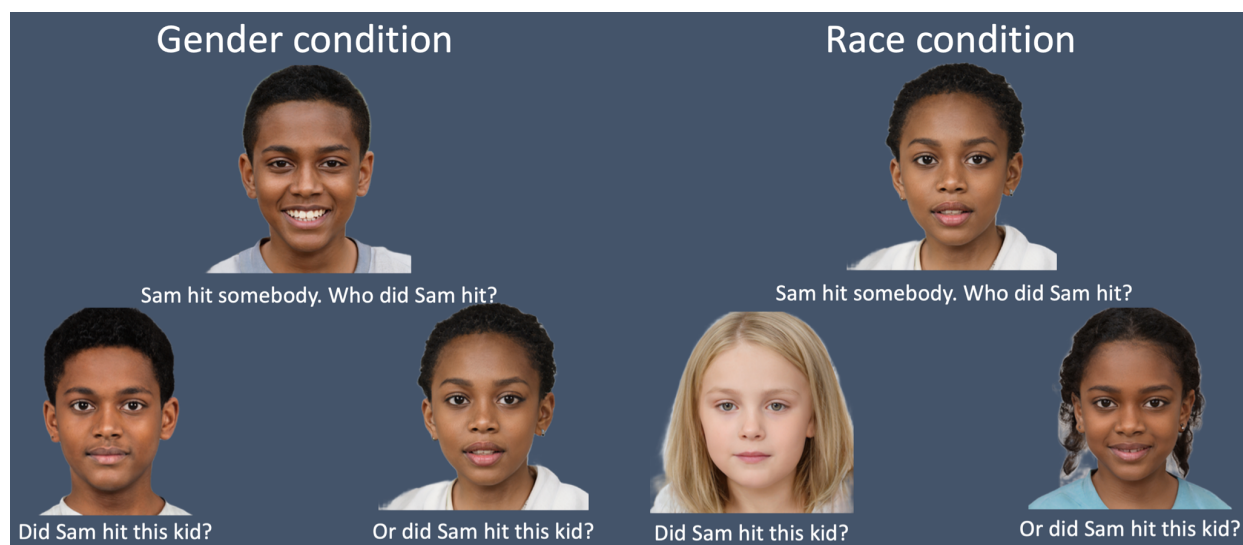
Within each condition, the race or gender of the agent was counterbalanced across trials (i.e., in the race conditions, half the trials included female agents and half the trials included male agents, and in the gender conditions, half the trials included Black agents and half the trials included White agents). Furthermore, whether the ingroup answer choice appeared on the right or left corner of the screen in each trial was counterbalanced across participants (i.e., for half the participants, the ingroup member was always on the right side of the screen, and for half the participants, the ingroup member was always on the left side of the screen). All of the characters

presented throughout the study were given gender-neutral names, to avoid drawing children's attention to gender. Additionally, labels for the relevant social categories (girl, boy, Black, White) were never mentioned throughout the study.

At the completion of the study, each participant was told, "We're all done. Great job! Remember, it's always good for kids to be nice to each other, no matter who they are!" For all trials, children's between-group predictions were coded as 0, and within-group predictions were coded as 1. Thus, average responses closer to 0 indicate that children were more likely to predict that the interaction would occur between members of different groups, while responses closer to 1 indicate that children were more likely to predict that the interaction would occur within members of the same group. Responses closer to .5 indicate that children did not hold systematic predictions for the recipient of the behaviors.

Figure 1

Example of a Mean Behavior Trial for the Gender and Race Conditions



Results

To analyze the results, we ran a binomial logistic regression model, testing whether category type (race, gender), behavior type (mean, nice, friendship, similarity), and age (as

continuous variable) influenced children's predictions. We found a main effect of behavior type, $\chi^2(3) = 31.36, p < .001$. There was also a three-way interaction between category type, behavior type, and age, $\chi^2(3) = 11.43, p = .010$. To follow up on this interaction, we split children into younger (3-5 years, $n = 157$) and older (6-7 years, $n = 152$) age groups. Within each age group, category, and behavior type, we tested whether children's predictions differed from chance using intercept-only models. All of the effects reported here are shown in Figure 2.

Gender Conditions

Mean Behaviors

Younger children did not differ from chance in their predictions for mean behaviors, $p > .05$ ($M = .48, CI = .39, .56$). Older children also did not differ from chance in their predictions of mean behaviors, $p > .05$ ($M = .48, CI = .38, .58$).

Nice Behaviors

Younger children predicted that nice behaviors would occur among members of the same gender, $\chi^2(1) = 5.05, p = .025$ ($M = .60, CI = .51, .68$). Older children also predicted within-gender niceness, $\chi^2(1) = 8.11, p = .004$ ($M = .64, CI = .55, .73$).

Friendship

Younger children predicted within-gender friendship, $\chi^2(1) = 18.30, p < .001$ ($M = .71, CI = .63, .80$). Older children predicted within-gender friendship as well, $\chi^2(1) = 10.33, p = .001$ ($M = .66, CI = .57, .75$).

Similarity

Younger children predicted within-gender similarity, $\chi^2(1) = 10.97, p < .001$ ($M = .66, CI = .57, .75$). Older children also predicted within-gender similarity, $\chi^2(1) = 21.31, p < .001$ ($M = .73, CI = .65, .82$).

Race Conditions

Mean Behaviors

Younger children predicted within-race meanness, $\chi^2(1) = 5.82, p = .016$ ($M = .61, CI = .52, .70$). Older children did not differ from chance in their predictions of mean behaviors, $p > .05$ ($M = .51, CI = .42, .59$).

Nice Behaviors

Younger children's predictions of nice behaviors did not differ from chance, $p > .05$ ($M = .55, CI = .46, .63$). Older children predicted that nice behaviors would occur among members of the same race, $\chi^2(1) = 9.69, p = .002$ ($M = .66, CI = .56, .75$).

Friendship

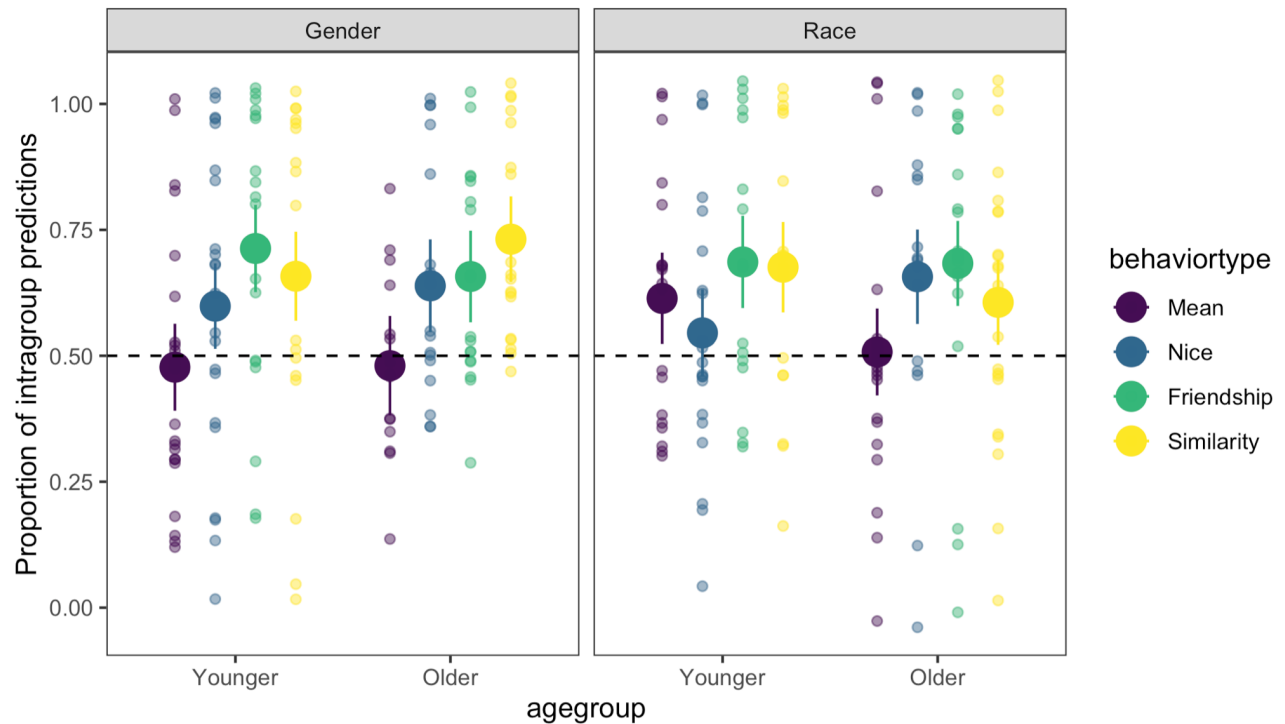
Younger children predicted within-race friendship, $\chi^2(1) = 13.46, p < .001$ ($M = .69, CI = .59, .78$). Older children similarly predicted within-race friendship, $\chi^2(1) = 15.36, p < .001$ ($M = .68, CI = .60, .77$).

Similarity

Younger children predicted within-race similarity, $\chi^2(1) = 12.78, p < .001$ ($M = .68, CI = .59, .77$). Older children also predicted within-race similarity, $\chi^2(1) = 5.85, p = .016$ ($M = .61, CI = .52, .69$).

Figure 2

Children's Predictions by Category, Behavior Type, and Age Group



Note. Large represent group means and error bars represent 95% confidence intervals. Small dots represent average scores for individual participants.

Participant Gender

Following these main analyses, we were interested in exploring effects of participant gender on children's judgments about gender-- in other words, in determining whether female participants performed differently from male participants on the gender trials. We ran a binomial logistic regression model on the gender conditions only, testing for effects of age group, behavior type, and participant gender. We found a main effect of behavior type, $\chi^2(3) = 27.64, p < .001$, suggesting that, consistent with the results reported above, children were at chance for their predictions of mean behaviors, and made within-gender predictions for nice behaviors, friendship, and similarity. No other effects were significant. Still, for exploratory purposes, we

tested each age/gender group against chance for each behavior type. The only differences between male and female participants emerged for their predictions of nice behaviors: Both younger and older female participants responded at chance levels (younger: $M = .52$, $CI = .37, .67$, $p > .05$; older: $M = .60$, $CI = .46, .75$, $p > .05$), whereas both younger and older male participants predicted within-gender niceness (younger: $\chi^2(1) = 6.66$, $p = .010$, $M = .64$, $CI = .54, .75$; older: $\chi^2(1) = 6.41$, $p = .011$, $M = .67$, $CI = .54, .79$).

Participant Race

Next, we were interested in whether participant race influenced children's predictions about racial groups. Children were split into "White" and "non-White" groups for this analysis, excluding children whose race was not reported. We ran a binomial logistic regression model to test for any effects of age group, behavior type, and participant race. We found a two-way interaction between behavior type and participant race $\chi^2(3) = 9.31$, $p = .025$, as well as a three-way interaction between behavior type, age group, and participant race, $\chi^2(3) = 24.15$, $p < .001$. To follow up on these effects, we tested each group against chance using intercept-only models. Figure 3 shows children's predictions of each behavior type, separated by age group and participant race. However, these findings should be interpreted with caution, because excluding children whose race was unreported resulted in a very small sample size.

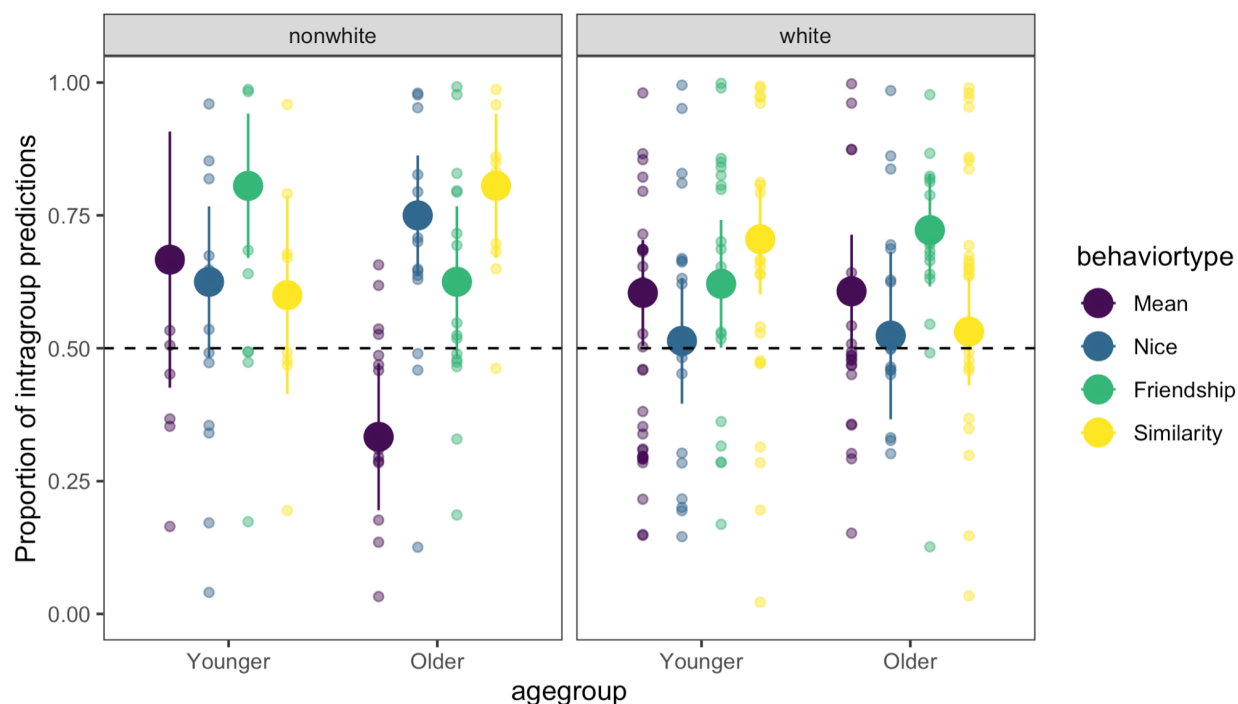
Younger Children (3-5 year-olds)

When White younger children were compared with non-White younger children, multiple differences in predictions arose. Firstly, while White children reliably predicted within-race meanness, $\chi^2(1) = 4.11$, $p = .043$, non-White children did not hold strong predictions about the recipient of mean behaviors, though their mean response levels indicate a trend toward within-race meanness as well ($p > .05$; $M = .67$, $CI = .42, .91$). Next, while White children did

not hold significant predictions about friendship ($p > .05$; $M = .62$, $CI = .50, .74$), non-White children predicted within-race friendship $\chi^2(1) = 11.39$, $p < .001$ ($M = .81$, $CI = .67, .94$). Finally, White children predicted that children of the same race would share properties, $\chi^2(1) = 12.33$, $p < .001$ ($M = .71$, $CI = .60, .81$), while non-White children did not ($p > .05$; $M = .60$, $CI = .41, .79$). There were no differences between White and non-White children for predictions of nice behaviors.

Older Children (6-7 year-olds)

Older White children were compared with older non-White children, revealing discrepancies between predictions for each behavior type. Beginning with mean behaviors, White children's predictions remained at chance levels, though their results trended toward within-race meanness ($p > .05$; $M = .61$, $CI = .50, .71$). Meanwhile, non-White children reliably predicted between-race meanness, $\chi^2(1) = 5.12$, $p = .024$ ($M = .33$, $CI = .20, .47$). For nice behaviors, White children remained at chance levels ($p > .05$; $M = .52$, $CI = .37, .68$), while non-White children predicted intragroup niceness, $\chi^2(1) = 13.58$, $p < .001$ ($M = .75$, $CI = .64, .86$). For friendship, White children predicted intragroup friendship, $\chi^2(1) = 13.19$, $p < .001$ ($M = .72$, $CI = .62, .83$), while non-White children did not ($p > .05$; $M = .63$, $CI = .48, .77$). Finally, for similarity, White children remained at chance in their predictions ($p > .05$; $M = .53$, $CI = .43, .63$), while non-White children predicted within-race similarity, $\chi^2(1) = 11.39$, $p < .001$ ($M = .81$, $CI = .67, .94$).

Figure 3*Children's Predictions for Behaviors Separated by Participant Race*

Note: Large dots represent group means and error bars represent 95% confidence intervals. Small dots represent average scores for individual participants.

Discussion

The present study examined whether children use race and gender as guides in their inferences about social interactions. Participants aged 3-7 years were assigned to either a race or gender condition and then to one of four behavior types: mean, nice, friendship, and similarity. Through Lookit, participants saw triads of characters and made predictions about the recipient of an agent's behavior. For analyses, participants were divided into a younger age group (3-5 years old) and an older age group (6-7 years old) to investigate developmental changes.

Gender

For gender, children of both age groups predicted that nice behaviors, friendship, and similarity would occur between members of the same gender, but they remained at chance levels in their predictions about mean behaviors. These findings are somewhat consistent with a previous Lookit study (Chalik & Dunham, unpublished), which tested the same behaviors with novel groups. In that study, older children similarly made within-group predictions for niceness, friendship, and similarity, but younger children remained at chance levels for nice behaviors and began predicting similarity at age 4. Because the present study divided children by age group and not by age in years, we cannot directly compare the similarity findings across the two studies. Regardless, the present study found that for race and gender, children develop beliefs about niceness earlier than past work suggests.

A more surprising result regarding gender was children's at-chance predictions for mean behaviors, which is inconsistent with results found in studies using novel groups (Chalik & Dunham, unpublished; Chalik & Rhodes, 2018), in which children made between-group predictions for mean behaviors. This discrepancy can be taken as evidence that children's theoretical understanding of social groups may not directly translate into their expectations of real-life social interactions. In the case of gender, children may have had experiences themselves, or at least may have witnessed, children being mean to members of the same gender. In fact, if children are predicting that girls will be friends with girls and likewise that boys will be friends with boys, children may believe that only friends, or people who could be friends, will be mean to each other. It is also possible that boys of this age have already been ingrained with the societal norm that a boy should not hurt a girl, and it is possible that girls are aware of this norm as well. Thus, it seems likely that children's theoretical conceptions of social groups conflicted with what they know about the real world, producing a null effect.

When children were separated to identify the potential influence of participant gender on their predictions regarding gender groups, a difference only emerged for predictions of nice behaviors. While both younger and older girls did not make systematic gender-based predictions of niceness, younger and older boys predicted within-gender niceness. This gender difference could be explained in a number of ways. One possibility is that parents and teachers emphasize politeness and kindness with girls more than they do with boys. Therefore, perhaps girls intuitively switched off between genders in choosing the recipients of nice behaviors. Meanwhile, it's possible that boys made predictions in line with their beliefs about gender and did not take such an egalitarian approach.

Race

For racial groups, both younger and older children predicted that friendship and similarity would occur between members of the same group. Younger children did not make race-based predictions about nice behaviors and actually expected members of the same race to be mean toward one another. Meanwhile, older children predicted within-race niceness but did not hold systematic expectations for mean behaviors. Younger children's predictions were therefore in line with previous work with novel groups, except for their prediction of within-race meanness. The finding appears counterintuitive – why would children predict that people will direct mean behaviors toward people of their own race? Like children's predictions about meanness in the gender trials, it seems that their predictions about race differ from those guided by their purely abstract theories. While, theoretically, children may expect people to direct mean behaviors toward outgroup members, it is possible that the young children in the present study have had few experiences with children of other races. As such, they may have drawn from their personal experiences with mean behaviors, experiences which consist of racially homogenous people. If

children rarely interact with other races, it makes sense that they would make such predictions. Even so, young children's prediction of within-race meanness is an open question that requires further research.

When children were separated by race into White and non-White groups, differences emerged in their predictions about each behavior type. For mean behaviors, younger non-White and older White children did not make race-based predictions. Meanwhile, younger White children predicted within-race meanness while older non-White children predicted between-race meanness. These results reflect that non-White children develop deeper understandings of racial groups and their implications prior to White children, as has been noted in prior work (Kinzler & Dautel, 2011; Roberts & Gelman, 2016). As suggested above, young White children may have had little experience with children of other races or may not yet hold strong beliefs about mean behaviors. On the other hand, by age 6, non-White children have had extensive experiences with people of different races, and thus believe that people will be mean to members of a different race than their own.

For nice behaviors, younger non-White children and White children at all ages did not hold systematic race-based predictions. The only group to hold expectations of within-race niceness was the older non-White children. Again, older non-White children seem to have a more advanced theory of interracial behavior than White children of the same age. Furthermore, for friendship, older non-White and younger White children did not make race-based predictions, though their responses trended toward within-race friendship. These results likely did not reach significance due to small sample size. However, younger non-White and older White children did predict within-race friendship. Finally, for similarity, younger non-White and older White children did not make race-based predictions, while older non-White and younger White children

did predict within-race similarity. It is surprising that older White children did not make race-based predictions, considering that younger White children did. In the above results, sample sizes were very small, especially for the non-White group. It is therefore crucial to consider all of the analyses that separated children by race with caution. However, despite the small sample sizes, the findings here reflect concrete differences between White and non-White children in their understanding of social groups. Future work is necessary to elaborate on these differences.

Conclusions

The present study provides insight into the way that children apply their theories of social categories to the real-world groups of race and gender, and reveals developmental changes in how children reason about these groups. Primarily, we have shown that younger children predicted within-group friendship and similarity for both gender and race, suggesting that these beliefs emerge in children as early as 3 years old. In contrast to beliefs about mean and nice behaviors, the expectations that members of the same social group will be friends with one another and share properties with one another appear to be shared relatively consistently across children.

These findings also reveal that children develop the belief that members of the same gender will be nice to one another prior to believing the same for race. Also, for gender, younger and older children show very similar patterns in their predictions. Children across the ages tested predicted within-gender niceness, friendship, and similarity, while responding at chance for mean behaviors. This similarity in predictions across ages suggests that children's theories of gender emerge early and remain relatively stable between the ages of 3 and 7. To children of this age range, gender may be a stronger predictor of social behavior than race. This conclusion is in line with previous work (Rogers & Meltzoff, 2017; Shutts et al., 2013).

Older children's predictions of race and gender appear to be similar to one another. By age 6, children's beliefs about friendship and similarity patterns, as well as their expectations about who will be nice to whom, are shaped by the social categories of race and gender; children generally expect that these behaviors will occur among members of the same group. These results are consistent with previous research (Chalik & Dunham, unpublished), which tested children's predictions about the same behaviors using novel groups. However, unlike in that study, older children in the present study did not use social categories to guide their expectations of mean behaviors. Also, when children were separated by gender and race, we found various diverging results. Therefore, the present study, when contrasted with novel groups studies, provides evidence that children's theoretical understanding of social groups differs from their expectations of real social groups, which further varies by the child's age, gender, and race.

To further expand on the developmental trajectory of children's predictions for gender- and race-based behavior, future work should include analyses at each age, including children younger than 3 and older than 7. Studies which do so will help illuminate more precise ways in which children's beliefs about gender and race categories develop. Another important area for future research is the development of expectations about social group-based meanness. Children in this study did not hold systematic predictions about mean behaviors, except for young children's predictions of within-race meanness. These findings were unexpected and reveal a substantial disparity between children's predictions in novel groups studies and their predictions about familiar social groups. However, when results were analyzed accounting for participant race, only younger White children systematically predicted within-group meanness. In fact, by age 6, non-White children predicted between-group meanness, expecting people to direct mean behaviors toward members of a different racial group than their own. We suggest that it may be

possible that White children, especially younger ones, have had few interactions with children of other races. Therefore, they may be drawing from personal experiences as opposed to their theories about social groups in making these predictions. To test this proposal, a future study could ask parents to describe the racial demographics of their child's classroom or close friends, or even to provide their zip code. Requesting this information could produce a measure of between-race interaction, which could be analyzed against children's predictions of behavior. If conducted over Zoom or in person, another future study could run the same experiment and ask children to explain why they chose the ingroup or outgroup member for each question. Such qualitative data could provide more insight into children's thought processes when making their predictions.

An alternative explanation for children's predictions of mean behaviors is that the practice trial affected their choices on the test trials. The practice trial consisted of a dog as the agent, another dog as the ingroup member, and a cat as the outgroup member. Children were asked to select the animal which was the same as the agent, and if they selected the cat, they were prompted until they selected the dog. We included this practice trial so that children would understand how to complete the test trials. However, it may have inadvertently indicated to children that there is a correct answer to each question, namely the member who appears most similar to the agent. The practice trial could have taught them to make predictions based on similarity, which then countered potential expectations for between-group meanness. While this is possible, older non-White children did make between-race predictions for meanness, and we also found null effects for many of the analyses of nice behaviors, so it is not clear that the practice trial was interpreted in this way. Nonetheless, the effects of practice trials should be

carefully considered, and the development of children's beliefs about meanness requires further study.

Another important limitation to the present study, which should be addressed in future work, is that our sample, though diverse, contained a majority of White children and a low percentage of Black children. In our exploratory analyses, we analyzed children's predictions regarding race by participant race, but all non-White children were grouped together due to small sample size. This grouping prevented us from determining how Black children specifically think about race, because it is very possible that they differ from Asian or mixed-race children, for example. Even so, we did find multiple differences between White and non-White children in this study, indicating that children hold differing expectations for the social world based on their own race. In the current social climate, it would be of interest and significance to examine the ways that Black children understand race in contrast to White children. It is plausible that Black families are more likely to have discussions about race, but even if not, Black children are constantly absorbing implicit messages about race from their families, teachers, and communities. On the other hand, though White children may be exposed to similar influences depending on their upbringing and communities, presumably they are receiving far less of this input.

As the social world shifts and changes with time, it is necessary to continue examining the ways in which children think about social categories. It is probable that many young children are beginning to notice and make sense of race earlier than they have in the past. It would also seem that with time, we may identify a shift in children's understanding of gender categories, as the concept of gender becomes increasingly more fluid in our world. Understanding the beliefs that children have about race and gender is of utmost importance, firstly to advance our

knowledge of the development of social cognition, but also so that we can pinpoint early interventions and ultimately help children navigate uncharted terrain.

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