Children's Implicit Attitudes Toward Targets Who Differ by Both Race and Gender

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Public Significance Statement

Do children show racial bias when presented with own-gender Black and other-gender White faces? This largely depends on how non-Black children categorized the faces; both girls and boys showed relatively more positive associations with own-gender Black faces (versus other-gender White faces) on an implicit measure when asked to categorize by gender as opposed to race. The findings highlight the persistent yet contextual nature of racial bias.

Abstract

In the current research we examined non-Black children's associations with targets who differed by both race and gender, with a focus on the role of categorization in informing children's biases. Children aged five- to twelve-years (*N*=206; 109 boys, 97 girls; 55% White; 68% of household incomes > $75,000/year), recruited from a science museum in a large multicultural Canadian city, completed a child-friendly Implicit Associations Test (IAT; Greenwald et al., 2003) that included own-gender Black and other-gender White targets. Children were randomly assigned to complete this IAT under one of three categorization conditions. When asked to categorize targets by gender as opposed to race, both girls and boys showed relatively more positive associations with own-gender Black targets over other-gender White targets. Children in a third, Ambiguous-Categorization (AC-IAT; Lipman et al., 2021) condition, which allowed for categorization by gender and/or race, were more likely to spontaneously categorize additional final trials primarily by gender (70%), suggesting that gender was the more salient social category. However, girls' and boys' biases in this condition differed, with girls showing relatively more positive associations with own-gender Black targets (Black girls>White boys) and boys showing relatively more positive associations with other-gender White targets (White girls>Black boys). In addition, the more boys and girls categorized by gender (over race) at the end of the task, the more they showed positive associations with own-gender Black targets over other-gender White targets. These findings provide insight into children's social categorization processes and biases toward targets who differ by both race and gender.

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Keywords: racial bias; gender; children; Implicit Association Test; categorization

Children's Implicit Attitudes Toward Targets Who Differ by Both Race and Gender

Racial prejudice is a pervasive social issue that can have detrimental consequences for the targets of prejudice and for broader society. Research suggests that the foundation of racial biases can appear very early in life. For example, studies have provided evidence that infants in racially homogeneous environments begin to distinguish faces based on race as early as three months of age (Bar-Haim et al., 2006; Kelly et al., 2005; see Charlesworth & Banaji, in press; Pauker et al., 2016 for reviews). Furthermore, a meta-analysis of studies examining prejudice in childhood suggests that the expression of bias against disadvantaged racial and ethnic outgroups emerges in preschool and increases into early childhood (Raabe & Beelmann, 2011; see also Aboud & Steele, 2017). Not only do young children generally express racial bias favoring advantaged racial and ethnic groups, but these biases are also evident on child-friendly versions of the most widely used implicit measure, the Implicit Association Test (IAT; Greenwald et al., 2003). Across a variety of studies in different cultural contexts, a pro-White (versus Black) bias has been found among both younger and older school-aged children on this implicit measure, with non-Black children being faster to associate White targets with pleasant images and Black targets with unpleasant images relative to the reverse pairing (Baron & Banaji, 2006; Dunham et al., 2006; 2008; Gonzalez et al., 2017, 2021; Newheiser et al., 2014; Newheiser & Olson, 2012; Rutland et al., 2005; Steele, George, Williams, & Tay, 2018; Williams & Steele, 2019).

Despite the prevalence of prejudice across a variety of cultural contexts, research also suggests that at an individual level, racial bias can be dynamic, malleable, and context-specific (Freeman & Ambday, 2011; Kunda & Thagard, 1996; Payne et al., 2017; Petsko & Bodenhausen, 2019; Vuletich & Payne, 2019). The people children encounter in their lives are multifaceted, having numerous aspects to their identities, with some social categories and perceptual cues having the potential to elicit competing associations and biases. While

children show race-based bias from early in development, research also suggests that children are attuned to other social categories and cues (Kinzler et al., 2009; Pauker et al., 2016; Rhodes & Baron, 2019; Shutts, 2015). For example, a Black girl might be spontaneously categorized as a member of her racial group (Black), a member of her gender group (girl), or both (e.g., a Black girl). Although substantial research has examined the development of racial prejudice in childhood, far less is known about children's social categorization processes and their spontaneously activated biases when faced with targets who can be categorized in multiple ways. The goal of the present research was to examine children's spontaneously activated associations with people who differed by both race and gender, with a with a focus on the influence of social categorization processes.

Social Categorization

Theory and research in impression formation and person perception, as well as more recent theorizing from an intersectional lens, suggests that the expression of racial bias can depend on the extent to which others are categorized by race as opposed to, or in conjunction with, other social categories or perceptual traits (Fiske et al., 1999; Freeman & Ambady, 2011; Petsko & Bodenhausen, 2019; Lei & Rhodes, 2021; Rhodes & Baron, 2019; Sinclair & Kunda, 1999; Williams & Steele, 2019). In some cases, one category or cue, such as race or gender, may dominate during person perception and in other cases multiple categories and cues are integrated to create an impression. According to recent theorizing by Petsko and Bodenhausen (2019), compartmentalization models of person perception assume that "certain forms of prejudice can be "switched on" by a social context, and…others can be "switched off" (Petsko & Bodenhausen, 2019, p. 5); importantly, bias will depend largely on the social category or categories that are being attended to in that context. Consistent with this possibility, an early study by Mitchell and colleagues (2003) demonstrated that how others are categorized can have downstream consequences for people's associations on implicit

measures. These researchers asked adult participants to complete an IAT that included familiar liked Black athletes and disliked White politicians. They found that people's associations with these targets depended on how they were instructed to categorize them. Participants showed relatively more positive associations with the liked Black athletes (versus disliked White politicians) when they were asked to categorize the images by their profession as opposed to their race. By changing the basis of categorization, identical targets elicited different affective responses.

More recent research suggests that social categorization processes can similarly impact children's attitudes toward Black targets that are smiling as compared to White targets with a neutral emotional expression (Lipman et al., 2021; see also Raissi & Steele, 2021; Steele, George, Cease et al., 2018 for related research with adults). Across several studies, non-Black children showed more positive associations with smiling Black versus neutral White targets faces when they were asked to categorize, or when they spontaneously categorized, these faces by emotional expression as opposed to race on a child-friendly IAT. The results of this study were the first in which non-Black school-aged children were relatively faster to pair Black (versus White) targets with positive (versus negative) stimuli on an implicit measure; however, this only occurred when these targets were seen as smiling and non-smiling children, and not as members of their racial groups. Conversely, when these same targets were categorized by their racial group membership, non-Black children's pro-White racial biases persisted *despite* the emotional expression of the target images (smiling for Black targets, neutral for White targets). These findings suggest that perceptual cues, such as emotional expression, can be used as a basis of social categorization and provide some insight into the dynamic nature of racial bias in childhood. What is less clear from these findings is whether the results would extend beyond emotional expressions that can suggest affiliative intentions, to other more salient and stable social categories.

Own-Gender Bias in Childhood

One social category that is particularly salient, especially in childhood, is gender (Arthur et al., 2010; Martin & Slepian, 2020; Shutts, 2013; 2015). Research suggests that infants show differential looking patterns based on gender by three months of age (Quinn et al., 2019). Within the first few years of children's lives, gender often becomes the most reliable social category used to guide children's behaviors, with preschool-aged children showing gender-stereotype consistent knowledge and preferences, own-gender peer preferences, as well as essentialist beliefs about gender (Arthur et al., 2010; Baron et al., 2014; Maccoby, 1998; Martin & Ruble, 2010; Rhodes & Mandalaywala, 2017; Shutts et al., 2010). It has been suggested that because gender is omnipresent in societies around the world, gender awareness might be supported by "a special cognitive system" (Shutts, 2013, p. 298) and may hold "a unique position in social life" (Dunham et al., 2015, p. 781). Furthermore, given the tendency for adults, and particularly parents, to label and functionally use gender when categorizing others, gender is likely to be psychologically salient to children (Arthur et al., 2010; Bigler & Liben, 2006).[1]

Few studies have made use of implicit measures to examine children's gender attitudes, however there is initial evidence that girls and boys show attitudes favoring their own gender on child-friendly IATs (Baron et al., 2014; Dunham et al., 2015; see also Cvencek et al., 2011; Rae & Olson, 2018). For example, Dunham et al. (2015), examined the gender attitudes of children aged 4 to 17 years and found that both girls and boys showed an own-gender implicit preference, with the magnitude of girls' bias being larger than that of boys. Additional process dissociation modeling (Conrey et al., 2005) suggests that both girls and boys in this study showed positive associations with their own gender; however, girls showed corresponding negative associations with 'male' whereas boys showed no consistent attitudinal bias with 'female'. In addition, when combined with adults' data, female

participants showed an increased own-gender bias with age, whereas for male participants this own-gender bias decreased with age.

The majority of research conducted to date has examined children's attitudes toward targets who differ by one social category, for example by race or by gender (Lei & Rhodes, 2021). Far less research has examined children's spontaneous associations with targets who differ simultaneously by two or more socially or perceptually salient categories (cf. Perszyk et al., 2019). In addition, very limited research has examined children's spontaneous social categorization processes when children are presented with others who could be categorized in multiple ways (cf. Lipman et al., 2021). Given the complexity of the people children encounter, combined with the dynamic nature of social categorization, there are both practical and theoretical reasons to examine children's spontaneous affective responses toward others who differ systematically across multiple perceptually salient social categories.

The Present Research

The goal of the current research was to increase our understanding of children's implicit social cognition by examining children's spontaneous associations when they are presented with targets who can be categorized in multiple ways. In the present study we focused on targets who differed by both race and gender. Specifically, we made use of a child-friendly Implicit Association Test designed to assess children's attitudes toward Black targets who shared children's own gender and White targets who did not. Varying targets in this way allowed us to examine whether ingroup biases favoring one's own gender would elicit competing associations that would counteract non-Black children's race-based biases toward targets who simultaneously differ by race, and whether this would depend on the basis of children's categorization. We focused specifically on bias toward Black versus White targets because of the ongoing inequities and inequalities faced by Black versus White children and adults in North America (e.g., Okonofua & Eberhardt, 2015; Rucker &

Richeson, 2021). Although Black men and women can face similar experiences of racism based on their shared racial group membership, research also suggests that Black women can face unique experiences of bias and even invisibility due to their intersecting and non-prototypical racial and gender identities (e.g., Lei & Rhodes, 2021; Purdie-Vaughns & Eibach, 2008; Thiem et al., 2019). As such, we were interested in children's associations with targets from both racial and gender groups.

In this study, children were randomly assigned to one of three conditions where they were shown a cartoon header that encouraged them to categorize own-gender Black targets and other-gender White targets by race, gender, or in a third Ambiguous-Categorization condition, by gender and/or race (Lipman et al., 2021; Steele, George, Cease et al., 2018). At the end of each IAT, we included five additional trials that appeared seamlessly as part of the final block. These trials consisted instead of *other*-gender Black targets and *own*-gender White targets and allowed us to assess children's categorization and, specifically, whether children were attending primarily to gender or race. Building on the findings from previous research that used a similar paradigm (Lipman et al., 2021), we predicted that children's affective responses on the IAT would differ depending on categorization on these final trials, with children showing more positive associations with own-gender Black targets versus other-gender White targets when they were asked to, or when they spontaneously, categorized by gender as opposed to race.

In addition, we examined whether the gender and age (younger versus older) of children would moderate any effects. As noted earlier, both boys and girls have been found to show relatively more positive associations with their own gender, however this was more pronounced for girls and was moderated by age with girls showing an increased own-gender bias and boys showing decreased own-gender bias with age. We tested whether similar patterns would emerge when children were presented with own-gender Black and other-

gender White targets. Finally, we examined whether the magnitude of children's bias would be related to the number of final trials that were categorized by race. We predicted that the more consistently children categorized these new targets by race over gender, the more they would show a racial bias favoring other-gender White over own-gender Black targets.

Method

Participants

Two hundred and twenty-five non-Black children between the ages of five- and twelve-years were recruited from, and tested in, a quiet location in a science museum in the large multicultural city of Toronto, Canada. Toronto is the largest city in Canada; over half of the population belongs to a racial and/or ethnic minority group and roughly 9% of the population racially identifies as Black (Toronto Public Health, 2019). Of the parents who provided their household income (n=152), the majority reported earning over $75,000/year (68%; n=103) with the modal (32%; n=49) response being $100,000-$150,000/year. The data from 19 children were excluded from all analyses because they chose not to complete the task (n=10), greater than 10% of their response latencies on critical trials were less than 300ms (n=2), or response error rates were 35% or greater (n=7; Gonzalez et al., 2017; 2021; Lipman et al., 2020). We also planned to exclude any participant whose D score was a numerical outlier (> 3SD), but none met this exclusion criterion. The final retained sample of 206 children (109 boys; 97 girls) included 109 younger (M_{age}=6 years; range 5- to 8- years) and 97 older (M_{age}=10 years; range 9- to 12-years) children. We made the a priori decision to group children into younger and older age groups because theories and research on prejudice development suggest key changes in social-cognitive development and prejudice expression between the age of 8- to 9-years (e.g., Aboud, 2008) and to be consistent with previous intergroup research that has taken a similar approach (Baron & Banaji, 2006; Dunham et al., 2006; Gonzalez et al., 2017; 2021; Lipman et al., 2021; Raabe & Beelmann, 2011; Williams

& Steele, 2019). The sample included 114 White, 40 South Asian, 35 East/Southeast Asian, 10 non-Black multiracial, 5 Latinx, and 2 Aboriginal participants. This study received approval from the XXX Research Ethics Board ("Understanding Intergroup Attitudes Across the Life Span" certificates #XXX and #XXX (blinded for review)). Prior to the study, written parental consent and demographics along with verbal child assent were obtained. A post-hoc power analysis using G*Power indicated that the final sample for our main analyses provided greater than 90% power to detect a medium-sized effect.

Measures and Procedure

Each child who agreed to participate, and whose parent had provided written consent, was randomly assigned to complete one of three child-friendly Implicit Association Tests (Greenwald et al., 2003) described as a matching game. The IAT is a computer-based reaction time measure designed to test the strength of associations between categories. As in previous studies (Lipman et al., 2021; Williams & Steele, 2019), to make this IAT child-friendly the stimuli used were all pictorial, the number of trials in each block was reduced (8 trials in each practice block; 8 'practice' and 16 'real' trials in each critical block), and a non-Black experimenter provided scripted verbal instructions.

In each condition, the Child IAT contained the same stimuli, with the exception that boys and girls saw different target faces, specifically racially prototypical own-gender Black (n=4) and other-gender White (n=4) targets matched for age, attractiveness, and a neutral emotional expression. Child gender was determined based on demographic information provided on the parental consent form. The target images were obtained through online searches and/or through our internal photo database and each image was edited to include the neck and head with a neutral white background. The attribute dimension for all IATs was represented by a set of eight gender-neutral pictures which included four pleasant (e.g.,

waterslides, beach setting, puppies, ice cream cone) and four unpleasant (e.g., medicine, factory pollution, a needle, oil spill) stimuli.

The basis of categorization depended on whether children were randomly assigned to a Race-Categorization, Gender-Categorization, or Ambiguous-Categorization condition. The header used for the Race-Categorization and Gender-Categorization conditions were identical for boys and girls and each header contained cartoon images (see Appendix). In the Race-Categorization condition, the header was designed to encourage participants to categorize the targets by race and contained cartoon images of a White girl and White boy on one side of the screen, and a Black girl and Black boy on the other side of the screen. In the Gender-Categorization condition, the header was designed to encourage participants categorize targets by gender and contained a White girl and Black girl on one side of the screen and a White boy and Black boy on the other side of the screen.

The header used in the Ambiguous-Categorization condition differed depending on participant gender and was designed to allow children to attend to race, gender, or both. Specifically, girls' saw a header containing a cartoon image of a Black girl on one side of the screen and a White boy on the other side; by contrast, boys saw a header containing a cartoon image of a Black boy on one side of the screen and a White girl on the other. In blocks where the attribute concept (pleasant and unpleasant) was categorized, the header contained a sun with the word 'pleasant' written above it on one side of the screen and a storm cloud with the word 'unpleasant' written above it on the other side of the screen. Children were asked to press one of two computer keys to match the images that appeared sequentially in the center of the screen to the header(s) on the left and right. The side on which each pairing appeared was counterbalanced across participants as was the order of the critical pairings. Images appeared within blocks in random order. A correct response was required to move to the next

trial. For incorrect responses, an "X" appeared beneath the stimulus and remained until the correct response was provided.

Participants also completed five additional *spontaneous categorization* trials, randomly selected from a pool of six images, that followed seamlessly at the end of their IAT (Lipman et al., 2021). The header from the last IAT block remained on the screen, but participants were now required to categorize *own*-gender White targets (n=3) and *other*-gender Black targets (n=3) that were matched for age, attractiveness, and neutral emotional expression and were racially prototypical. That is, in these final five trials, selected at random without replacement from the six images, boys now saw White boys and Black girls (as opposed to Black boys and White girls in the main task); girls saw Black boys and White girls (as opposed to Black girls and White boys in the main task). In the Race-Categorization and Gender-Categorization conditions, this allowed us to check that children continued to categorize these new targets by race or gender, respectively. In the Ambiguous-Categorization condition, this allowed us to examine whether children were primarily attending to race, gender, or both by calculating the number of these final five trials that were categorized by race (as opposed to gender). For example, if attending primarily to race, we would expect girls to sort a White girl with a White boy header instead of a Black girl header. By contrast, if attending primarily to gender, we would expect girls to sort a White girl with a Black girl header as opposed to a White boy header. Upon completion of the study, each child was debriefed and given a certificate and a sticker; parents were provided a debriefing form.

Results

For each participant, an IAT *D* score was created following the scoring algorithm recommended by Greenwald et al. (2003). Higher *D* scores indicate faster responding in the

trials where children paired other-gender White faces with pleasant images and own-gender Black faces with unpleasant images, relative to the reverse pairing.

To examine our research questions, we first conducted a 3(Condition: Race-Categorization, Gender-Categorization, Ambiguous-Categorization) x 2(Gender of Participant: Boy or Girl) x 2(Age Group: Younger, Older) between-subjects ANOVA using *D* scores as the dependent measure. This revealed a significant main effect of Condition, $F(2, 194)=30.32$, $p<.001$, $\eta_p^2=.24$, a significant main effect of Gender of Participant, $F(1, 194)=9.09$, $p=.003$, $\eta_p^2=.05$, and a significant Condition by Gender of Participant interaction, $F(2, 194)=10.28$, $p<.001$, $\eta_p^2=.10$, see Figure 1. No other main effects or interactions were significant, Fs<3.4, ps>.06, η_p^2s<.02.[2]

To decompose this significant interaction effect, we first re-ran a 3(Condition: Race-Categorization, Gender-Categorization, Ambiguous-Categorization) between-subjects ANOVA for boys and girls separately. For boys, a main effect of Condition emerged, $F(2, 106)=9.39$, $p<.001$, $\eta_p^2=.15$. As expected, Tukey's post-hoc tests revealed that boys in the Race-Categorization condition ($D=.31$, $SD=.48$) showed a significantly different pattern of bias than boys in the Gender-Categorization condition ($D=-.11$, $SD=.39$; $p<.001$). In addition, the *D* scores of boys in the Ambiguous-Categorization condition ($D=.20$, $SD=.48$) did not differ from boys in the Race-Categorization condition ($p=.56$) but did differ from the biases of boys in the Gender-Categorization condition ($p=.02$). For girls, a main effect of Condition, $F(2, 94)=31.55$, $p<.001$, $\eta_p^2=.40$ also emerged. Post-hoc tests again revealed that, as expected, the associations of girls in the Race-Categorization condition ($D=.42$, $SD=.42$) differed from girls in the Gender-Categorization condition ($D=-.25$, $SD=.43$; $p<.001$). Unlike boys, however, the *D* scores of girls in the Ambiguous-Categorization condition ($D=-.35$, $SD=.44$) differed from girls in the Race-Categorization condition ($p<.001$) but did not differ from girls in the Gender-Categorization condition ($p=.63$). That is, boys in the Ambiguous-

Categorization condition showed a pattern of bias similar to boys in the Race-Categorization condition; by contrast, girls in the Ambiguous-Categorization condition showed a pattern of bias similar to girls in the Gender-Categorization condition.

Additional one-sample *t*-tests comparing *D* scores to zero suggest that boys in both the Race-Categorization, $t(42)=4.23$, $p<.001$, and the Ambiguous-Categorization, $t(28)=2.26$, $p=.03$, conditions were faster to pair White girls with pleasant and Black boys with unpleasant relative to the reverse pairing. By contrast, boys in the Gender-Categorization condition showed the reverse pattern, being faster to pair Black boys with pleasant and White girls with unpleasant relative to the reverse pairing, although this difference was not significant, $t(37)=-1.8$, $p=.08$. Girls in the Race-Categorization condition, $t(34)=5.95$, $p<.001$, were faster to pair White boys with pleasant and Black girls with unpleasant relative to the reverse pairing. By contrast, girls in both the Gender-Categorization condition, $t(31)=-3.25$, $p=.003$, and the Ambiguous-Categorization condition, $t(29)=-4.34$, $p<.001$, showed the reverse pattern, being faster to pair Black girls with pleasant and White boys with unpleasant relative to the reverse pairing.

We also compared boys' and girls' responses within each condition. Boys' ($D=.31$, $SD=.48$) and girls' ($D=.42$, $SD=.42$) bias did not differ in the Race-Categorization condition, $t(75)=-1.08$, $p=.29$, despite the fact that they had categorized target images that also differed by gender. The magnitude of bias for boys ($D=-.11$, $SD=.39$) and girls ($D=-.25$, $SD=.43$) also did not differ in the Gender-Categorization condition, $t(68)=1.38$, $p=.17$. Of particular interest was any difference that might emerge between boys and girls in the Ambiguous-Categorization condition, where children were not shown how to categorize these targets that differed both by gender and race. The bias of boys ($D=.20$, $SD=.48$) and girls ($D=-.35$, $SD=.44$) in this condition differed, $t(57)=4.60$, $p<.001$.

To better understand these differences, we examined how participants categorized the majority of the final five *spontaneous categorization* trials across each of the three conditions (see Table 1). Specifically, we examined whether the majority of these trials were categorized by race or gender. As expected, most participants in the Race-Categorization condition (72/77; 91%) categorized the majority (at least three) of the final five trials by race. Similarly, most participants in the Gender-Categorization condition (68/70; 97%) categorized the majority of the final five trials by gender. After being instructed to use the headers to categorize these faces, most children continued to use this strategy in the final five trials. Participants in the Ambiguous-Categorization condition were more likely to categorize the majority of the final trials by gender (41/59; 70%) as opposed to race (18/59; 30%), $\chi^2(1)=8.97$, $p=.003$. Surprisingly, this pattern did not differ by participant gender, $\chi^2(1)=.43$, $p=.51$ (boys: 19/29; 66% by gender: girls: 22/30; 73% by gender).

In addition, a 2(Final Categorization Trials: Majority by Race, Majority by Emotion) x 2(Gender of Participant: Boy or Girl) ANOVA, using *D* scores from participants in the Ambiguous-Categorization condition as the dependent variable, revealed a significant main effect of Final Categorization Trials, $F(1, 55)=9.04$, $p=.004$, $\eta_p^2=.14$. Participants who spontaneously categorized the majority of the final five trials by race were relatively faster at responding when other-gender White targets were paired with pleasant images and own-gender Black targets were paired with unpleasant images ($D=.21$, $SD=.49$) as compared to those who categorized the majority of the final trials by gender ($D=-.21$, $SD=.51$). A main effect of Gender of Participant also emerged, $F(1, 55)=15.96$, $p<.001$, $\eta_p^2=.23$; with girls ($D=-.35$, $SD=.44$) showing relatively more positive associations with own-gender Black targets than boys ($D=.20$, $SD=.48$). The interaction was not significant, $F(1, 55)=.39$, $p=.53$, $\eta_p^2=.01$.

Finally, we found a significant correlation between the number of final trials categorized by gender versus race (0-5; with 0 indicating all trials were categorized by gender and 5 indicating all were categorized by race) and the speed with which children associated other-gender White targets with pleasant images and own-gender Black targets with unpleasant images, $r_\rho(206)=.42$, $p<.001$. This finding suggests that the more of these final trials participants categorized by race (over gender) the more racial (versus gender) bias they showed. A significant correlation emerged for both boys, $r_\rho(109)=.25$, $p=.008$, and girls, $r_\rho(97)=.56$, $p<.001$, as well as when only participants in the Ambiguous-Categorization condition were considered, $r_\rho(59)=.40$, $p=.002$. The more children categorized the final trials by race (over gender) the faster they were to pair other-gender White targets with pleasant and own-gender Black targets with unpleasant, relative to the reverse pairing.

Discussion

In the current research we examined non-Black children's associations with own-gender Black and other-gender White targets. We found that children's associations largely depended on the basis of their categorization. Both boys and girls showed more positive associations with own-gender Black, versus other-gender White, targets when encouraged to categorize these faces by gender as opposed to race. In addition, the magnitude of bias did not differ between boys and girls in either the Race-Categorization or the Gender-Categorization conditions. Children in the Race-Categorization condition were faster to pair other-gender White faces with pleasant images and same-gender Black faces with unpleasant images. This pro-White bias emerged despite the fact that children shared the same gender as the Black, but not the White, targets. In addition, there was no effect of participant gender, despite the fact that boys saw Black boys and White girls while girls saw Black girls and White boys. This finding is consistent with the pattern of racial bias that has been found with non-Black participants in other studies when children have been asked to categorize faces,

sometimes mixed-gender faces, by race (Baron & Banaji, 2006; Dunham et al., 2006, 2008; Gonzalez et al., 2017, 2021; Newheiser et al., 2014; Newheiser & Olson, 2012; Rutland et al., 2005; Steele, George, Williams, & Tay, 2018; Williams & Steele, 2019). In the current research, when categorizing these different-gender targets by race, ingroup gender bias did not attenuate racial bias.

By contrast, both boys and girls in the Gender-Categorization condition showed more positive associations with own-gender Black targets, over other-gender White targets, although for boys this was not statistically significant. It seems possible that this lack of significant own-gender bias for boys was due to a small sample size combined with boys' (and men's) tendency to show less positive own-gender associations on implicit measures than girls (and women; Dunham et al., 2015). Despite the lack of own-gender bias among boys, in our study, the magnitude of own-gender bias did not differ by participant gender. Taken together, this finding extends previous results by providing some evidence that own-gender bias can emerge even when children categorize own-gender Black and other gender White targets. Importantly, this greater relative positivity toward Black over White targets only emerged when own-gender Black and other-gender White faces were categorized by gender. As noted earlier, own-gender bias was eliminated when children were instead encouraged to categorize these same targets by race.

The Ambiguous-Categorization condition allowed us to examine children's biases when they could use the headers to successfully categorize these faces by race, gender, or both. The results from the final five *spontaneous categorization* trials suggest that, consistent with research that has made use of explicit measures with preschoolers (Shutts et al., 2010, 2013), children were more likely to categorize these final trials by gender as opposed to race. In addition, girls' biases were consistent with this categorization. Specifically, girls' pattern of associations did not differ when the Ambiguous-Categorization and Gender-Categorization

conditions were compared. This finding is consistent with the possibility that girls were largely spontaneously categorizing Black girls and White boys as girls and boys in this task. The downstream consequence of this categorization was that girls showed relatively more positive associations with Black girls over White boys.

By contrast, boys in the Ambiguous-Categorization condition showed a different pattern of bias from boys in the Gender-Categorization condition, and their bias did not differ from boys' biases in the Race-Categorization condition. Given boys' tendency to categorize primarily by gender in the final trials, it is not clear why this pattern of bias emerged; however, previous research examining associations with Black and White 4- and 5-year-old boys and girls using a different implicit measure, the Affect Misattribution Procedure (Payne et al., 2005; Williams et al., 2016), provides some potential insight. Perszyk et al. (2019) found that neutral images that followed Black boy primes were rated less positively than following Black girl, or White boy or girl, primes suggesting that children's racial biases might be particularly likely to emerge in response to Black boys. Although speculative, it seems possible that boys in this condition were attending to both race and gender throughout this task (Petsko & Bodenhausen, 2019; see also Lei & Rhodes, 2021), effectively conceptualizing these as White girls and Black boys, and that boys' associations were more affected by racial than gender biases throughout the task, despite their greater attention to gender when categorizing the final trials.

Consistent with the possibility that some children were attending to both gender and race or were varying their basis of categorization throughout the task, the degree to which children categorized the final trials by race (versus gender) was related to their associations. This was the case for boys and girls across all conditions, as well as when only the responses of children in the Ambiguous-Categorization condition were considered. The more consistently children categorized these targets as members of a racial group as opposed to

their own gender in the final five trials, the more their associations were consistent with racial as opposed to own-gender biases.

Theoretically the results provide new insights into when children's implicit racial and gender bias will be expressed. When the task required children to categorize others by race, or when children spontaneously categorized by race, the ensuing biases reflected preferences for other-gender White children, versus own-gender Black children, on this implicit measure. Consistent with a compartmentalization model of person perception (Petsko & Bodenhausen, 2019), these findings provide additional evidence of the contextual nature of racial bias and suggest that both situation-specific and chronic accessibility of race can influence the expression of racial bias, even in childhood. From a practical perspective, the current findings might seem to suggest that to decrease children's racial biases, adults should ignore race and to instead draw children's attention to shared identities, including gender. Other research, however, suggests important downsides to taking this "colorblind" approach. As one example, children aged 8- to 11-years who were exposed to colorblind messages (e.g., "…race is not important…we're all the same"), versus diversity valuing messages (e.g., "…our racial differences make each of us special"), were less likely to identify discrimination when faced with scenarios involving overt racism (Apfelbaum et al., 2010, p. 158). As such, we believe that it is important for parents and educators to consider the frequency, contexts, and ways in which race is discussed with children. In addition, it would be useful for future research to continue to identify when and how it is beneficial to draw children's attention to race, gender, and other social identities, while simultaneously working to identify ways to remedy the individual and structural biases that serve as ongoing barriers to equity in society.

Some limitations to this research include that we made use of only one implicit measure that requires that children think categorically, which might have led children in the

Ambiguous-Categorization condition to attend to whichever social category (gender, race, or both) allowed them to complete the task most easily. As such, this may not reflect the category that would be most salient to them in other contexts. In addition, it is difficult for us to assess from our task whether some children were attending to gender and race in an intersecting way (e.g., Black girls) as opposed to potentially alternating categorizing children by race (Black) and gender (e.g., girls). As such, our results might more accurately reflect the relative accessibility or primacy of race or gender throughout the task as opposed to perceptions of intersecting identities. Another limitation is that we only examined attitudes toward targets from specific social groups whose race (White and Black) and gender (male and female) could easily be categorized. While this allowed us to examine categorization processes and the consequences for implicit attitudes, it will be important to extend this research to other targets groups and more diverse exemplars in order to better understand the contexts in which biases are and are not likely to be activated.

The current findings serve to further highlight the dynamic nature of children's biases. Despite racial and gender biases being pervasive and persistent at a group level, individual attitudes are online constructions that can be fluid and context-specific (Freeman & Ambady, 2011; Payne et al., 2017; Petsko & Bodenhausen, 2019; Vuletich & Payne, 2019). This research adds to a growing body of literature that examines social categorization processes in childhood and provides a deeper appreciation of the conditions under which children show race and gender biases on implicit measures. Through ongoing research, it is hoped that we can continue to find ways to not only identify but also challenge these biases.

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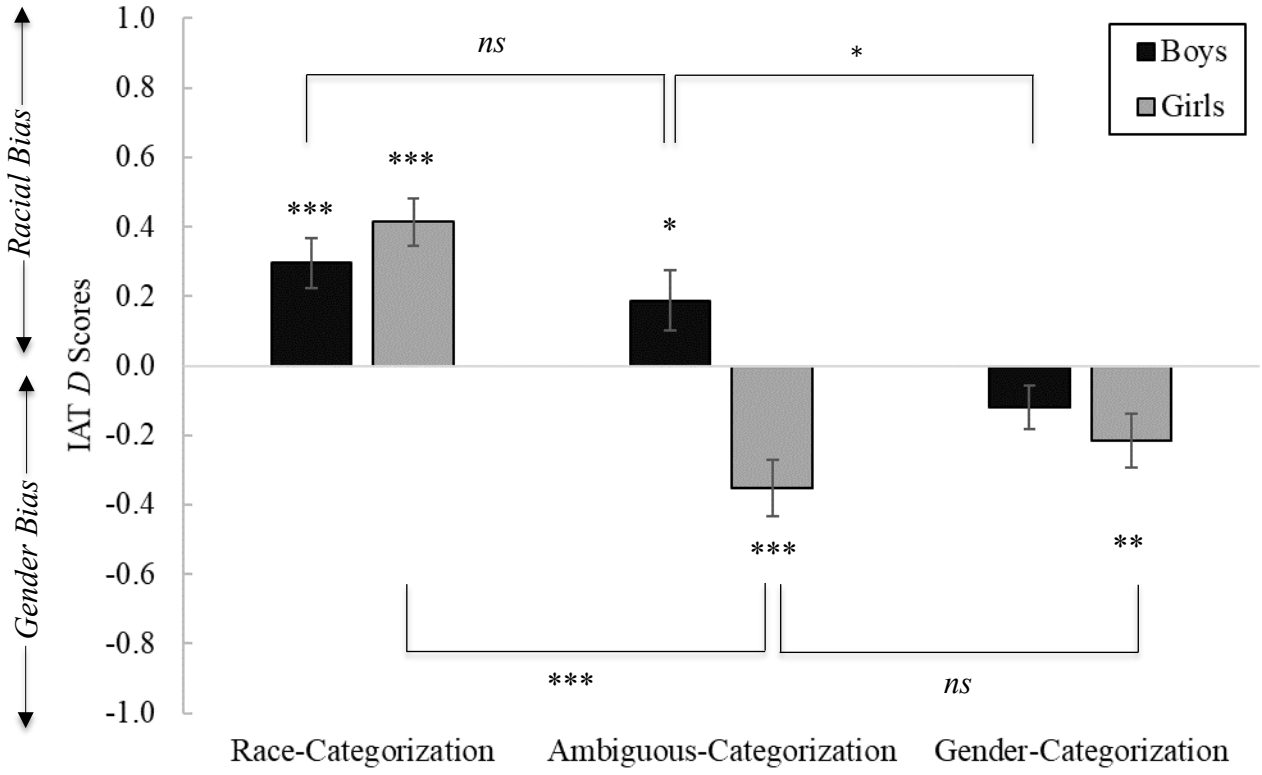
Figure 1

Implicit attitudes by condition and gender of participant.



Note. Positive IAT *D* scores would be consistent with racial bias, with children being relatively faster at pairing White (other-gender) targets with pleasant images and Black (same-gender) targets with unpleasant images. Negative IAT *D* scores would be consistent with gender bias, with children being relatively faster at pairing same-gender (Black) targets with pleasant images and other-gender (White) targets with unpleasant images. Error bars represent the standard error. Asterisks shows whether the Ambiguous-Categorization condition differed from either other condition for boys and girls separately, and whether each condition differed significantly from zero.

* $p<.05$, ** $p<.01$, *** $p<.001$

Table 1

Number of final trials categorized by race separated by condition and gender of participant

	Majority Sorted by Race						Majority Sorted by Gender					
	All by race		*Mixed*								*All by gender*	
	5/5		4/5		3/5		2/5		1/5		0/5	
BOYS	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Race-Categorization Condition (*n* =42)	26	62%	11	26%	2	5%	0	0%	1	2%	2	5%
Gender-Categorization Condition (*n* = 38)	0	0%	0	0%	1	3%	2	5%	10	26%	25	66%
Ambiguous-Categorization Condition (*n* = 29)	4	14%	2	7%	4	14%	3	10%	7	24%	9	31%
GIRLS												
Race-Categorization Condition (*n* =35)	21	60%	8	22%	2	6%	1	3%	1	3%	2	6%
Gender-Categorization Condition (*n* = 32)	0	0%	1	3%	0	0%	4	13%	4	13%	23	71%
Ambiguous-Categorization Condition (*n* = 30)	3	10%	3	10%	2	7%	3	10%	5	16%	14	47%
All Participants (*n* = 206)	**54**	**26%**	**25**	**12%**	**11**	**5%**	**13**	**6%**	**28**	**14%**	**75**	**37%**

Note. All participants sorted five additional *spontaneous categorization* trials that followed seamlessly at the end of their IAT. During these trials, the header from the last IAT block of critical trials remained on the screen and participants were now required to categorize own-gender White targets and other-gender Black targets. The number (*N*) and percentage (%) refers to how many participants sorted those final five trials by race as opposed to gender.

Footnotes

[1]In the current research design, we take a binary approach to gender but acknowledge the gender diversity that exists within society, which includes people who are transgender and nonbinary. We also recognize and agree with the benefits of conceptualizing gender and gender identity as being dynamic, culturally constructed, multidimentional, and continuous (Diekman & Schmader, in press; Hyde et al., 2018; Rubin et al. 2020).

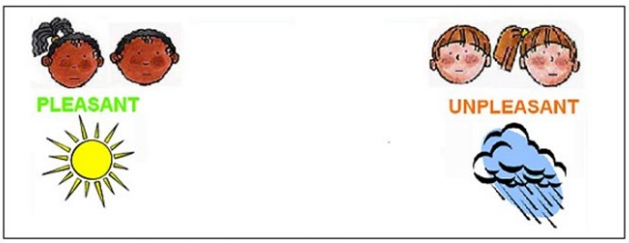
[2]Treating age as a continuous variable led to similar results.

Appendix

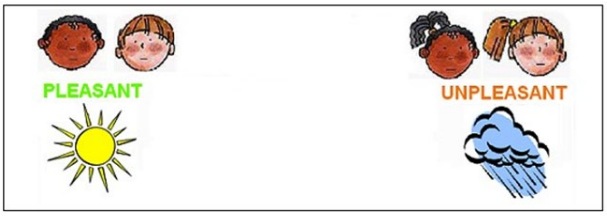
Sample Headers for the Child IATs

Figure A1

Race-Categorization Condition

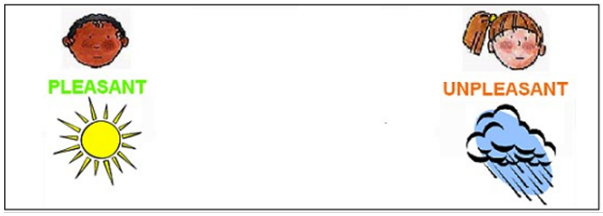


Gender-Categorization Condition



Ambiguous-Categorization Condition (Girls)

Ambiguous-Categorization Condition (Boys)



Note. In each condition, children were trained to use the headers to sort the images. The sun and cloud were used as visual reminders for pleasant and unpleasant. The side and pairing order for each header in the critical blocks were counterbalanced between participants.