Developmental Psychology

Essentialist Thinking Predicts Decrements in Children's Memory for Racially Ambiguous Faces

Sarah E. Gaither, Jennifer R. Schultz, Kristin Pauker, Samuel R. Sommers, Keith B. Maddox, and Nalini Ambady

Online First Publication, July 1, 2013. doi: 10.1037/a0033493

CITATION

Gaither, S. E., Schultz, J. R., Pauker, K., Sommers, S. R., Maddox, K. B., & Ambady, N. (2013, July 1). Essentialist Thinking Predicts Decrements in Children's Memory for Racially Ambiguous Faces. *Developmental Psychology*. Advance online publication. doi: 10.1037/a0033493

BRIEF REPORT

Essentialist Thinking Predicts Decrements in Children's Memory for Racially Ambiguous Faces

Sarah E. Gaither and Jennifer R. Schultz Tufts University Kristin Pauker University of Hawaii

Samuel R. Sommers and Keith B. Maddox Tufts University Nalini Ambady Stanford University

Past research shows that adults often display poor memory for racially ambiguous and racial outgroup faces, with both face types remembered worse than own-race faces. In the present study, the authors examined whether children also show this pattern of results. They also examined whether emerging essentialist thinking about race predicts children's memory for faces. Seventy-four White children (ages 4–9 years) completed a face-memory task comprising White, Black, and racially ambiguous Black—White faces. Essentialist thinking about race was also assessed (i.e., thinking of race as immutable and biologically based). White children who used essentialist thinking showed the same bias as White adults: They remembered White faces significantly better than they remembered ambiguous and Black faces. However, children who did not use essentialist thinking remembered both White and racially ambiguous faces significantly better than they remembered Black faces. This finding suggests a specific shift in racial thinking wherein the boundaries between racial groups become more discrete, highlighting the importance of how race is conceptualized in judgments of racially ambiguous individuals.

Keywords: own-race bias, racially ambiguous, face memory, racial essentialism

Although race is a socially constructed category used to sort humans into distinct groups, people often treat this category as naturally existing (e.g., Markus, 2008). People frequently construe race as biologically based and immutable and ascribe inherent meaning to these categories on the basis of physical characteristics associated with racial groups (Rothbart & Taylor, 1992). In adults, such essentialist thinking about race has been shown to lead to prejudice and decreased motivation to

Sarah E. Gaither and Jennifer R. Schultz, Department of Psychology, Tufts University; Kristin Pauker, Department of Psychology, University of Hawaii; Samuel R. Sommers and Keith B. Maddox, Department of Psychology, Tufts University; Nalini Ambady, Department of Psychology, Stanford University.

We thank the Living Laboratory at the Museum of Science, Boston, Massachusetts; the Tufts Educational Day Care Center; the Eliot-Pearson Children's School for recruitment assistance; and all of the families for participating. This work was supported by a National Science Foundation Graduate Research Fellowship and a Tufts Graduate Research Award, both awarded to Sarah E. Gaither; National Institute of Child Development Award K99HD065741-02 granted to Kristin Pauker; and a grant from the Russell Sage Foundation awarded to Samuel R. Sommers.

Correspondence concerning this article should be addressed to Sarah E. Gaither, Department of Psychology, Tufts University, 490 Boston Avenue, Medford, MA 02155. E-mail: sarah.gaither@tufts.edu

cross racial boundaries (e.g., Haslam, Rothschild, & Ernst, 2002; Jayaratne et al., 2006; Keller, 2005; Levy, Stroessner, & Dweck, 1998; Williams & Eberhardt, 2008; Yzerbyt, Rocher, & Schadron, 1997). However, only a handful of studies have explored the social consequences of essentialist thinking in children. Here, we examined whether children's emerging essentialist thinking about race has consequences for their memory for faces at the boundary of race (i.e., racially ambiguous faces).

Essentialist thinking is grounded in the belief that certain categories have important underlying essences that define their nature (Gelman, 2003; Medin & Ortony, 1989). Developmental work on psychological essentialism has demonstrated that children exhibit essentialist thinking about both biological animal categories (e.g., Gelman & Wellman, 1991) and a specific subset of social categories (e.g., race and gender; Hirschfeld, 1995; Rhodes & Gelman, 2009; Taylor, 1996) as early as age 4 years. Essentialism has been defined in a variety of ways in the literature (see Gelman, 2003; Medin & Ortony, 1989, for reviews), but essentialist thinking about social categories is thought to possess two main components: inalterable membership and inductive potential (Rothbart & Taylor, 1992). Although there are many aspects of essentialism, here we focus on the implications of one component of essentialist thinking—the perception of the inalterability of group membership—within the domain of race. We examined several features that are consistently viewed as central to essentialist beliefs—that 2 GAITHER ET AL.

racial categories are viewed as stable, unchanging, likely to be present at birth, and biologically based.

Children appear to essentialize some social categories more readily than others. Although one study found that children at age 4 years readily essentialize gender but not race (Rhodes & Gelman, 2009), evidence regarding precisely when children begin to exhibit racial essentialism remains inconclusive. Some studies suggest that children exhibit components of essentialist thinking about race, such as understanding biological inheritance, as early as 4 years of age (e.g., Hirschfeld, 1995), whereas others argue that a more coherent essentialist outlook does not emerge until considerably later in childhood (e.g., Aboud, 1984; Pauker, Ambady, & Apfelbaum, 2010; Rhodes & Gelman, 2009). Furthermore, the extent to which children essentialize race seems to vary on the basis of task (e.g., Giménez & Harris, 2002; Kinzler & Dautel, 2012) and cultural context (Rhodes & Gelman, 2009). Here, we examined essentialist thinking across a wide age range (4-9 years). We expected that children's essentialist thinking about race should observably change over this age range and permit exploration of its role in social perception. Thus, examining this age range should adequately capture variability in children's emerging essentialist thinking and the potential implications of these beliefs for children's memory for faces at the boundary of race.

Racial essentialism is a multifaceted construct encompassing social, cultural, and cognitive components that impact perception, mental representation, and judgment. For example, some studies have linked essentialist thinking to children's endorsement and use of racial stereotypes (Levy & Dweck, 1999; Pauker, Ambady, & Apfelbaum, 2010). Accordingly, essentialist thinking likely plays a role in more basic aspects of children's social cognition, such as how children perceive racial group boundaries. Work with adults indicates that essentialized categories have absolute rather than graded memberships (Kalish, 2002) and possess discrete boundaries (Haslam, Rothschild, & Ernst, 2000). Although representing categories as fundamentally distinct is important for learning about objective distinctions between different categories (e.g., "that is a dog, not a cat"), essentialist thinking can be problematic when applied to social categories. When applied to race, essentialism promotes the belief that subjective racial categories are objective and natural, exaggerating distinctions between groups and minimizing the considerable variation in appearance that exists within and at the boundaries of racial groups (e.g., Freeman, Pauker, Apfelbaum, & Ambady, 2010; Maddox & Gray, 2002). Thus, essentialist thinking promotes the perception that the boundaries between racial groups are clear (Plaks, Malahy, Sedlins, & Shoda, 2012), when in reality there is considerable variation and ambigu-

To this point, we have considered the role of essentialist thinking in judgments regarding individuals who are perceived as clear and unambiguous members of a racial category. However, essentialist thinking should be particularly important when there is some question about group membership—as in the case of racially ambiguous individuals—who are not easily categorized by race due to the racial ambiguity of their features (Pauker, Rule, & Ambady, 2010). Throughout U.S. history, the principle of *hypodescent* has been used to assign mixed-race individuals to their socially subordinate group. For example, early in American history, White slave owners used the *one-drop rule*—whereby one drop of Black blood identified an individual as Black—to disam-

biguate mixed-race individuals and, as a result, consigned thousands to slavery (Davis, 1991). Despite the fact that institutionalized practices of the one-drop rule have been banished, the principle of hypodescent continues to influence American adults' racial categorization (Halberstadt, Sherman, & Sherman, 2011; Ho, Sidanius, Levin, & Banaji, 2011; Peery & Bodenhausen, 2008). This tendency to categorize racially ambiguous individuals as belonging to their socially subordinate group is particularly true for adults who endorse racial essentialism (Chao, Hong, & Chiu, 2013). Levels of essentialist thinking also predict adults' reliance on discrete racial category labels when processing and trying to remember racially ambiguous faces in comparison to processing unambiguous faces (Eberhardt, Dasgupta, & Banaszynski, 2003; Pauker & Ambady, 2009). Finally, racially ambiguous faces are less likely to be accurately remembered in comparison to racially unambiguous ingroup faces (e.g., Corneille, Huart, Becquart, & Brédart, 2004; Pauker et al., 2009). These results are consistent with the well-documented own-race bias in which perceivers are better at remembering ingroup compared with outgroup faces (e.g., Hugenberg, Young, Bernstein, & Sacco, 2010; Meissner & Brigham, 2001). In the case of racially ambiguous group members, the tendency to exclude racially ambiguous individuals from the ingroup and to frequently classify them as part of the outgroup leads to poorer memory for racially ambiguous faces (Pauker et al., 2009). Moreover, differences in racial essentialism do not appear to predict memory for individuals who can clearly be classified into groups but do predict memory for racially ambiguous faces (Pauker, Weisbuch, & Ambady, 2011).

Thus we propose that children's emerging racial essentialism should be associated with perceiving racial categories as fundamentally distinct and should predict poorer memory for racially ambiguous faces compared with clearly ingroup faces. To test this idea, we adapted a recognition memory paradigm used with adults (Pauker et al., 2009) to assess memory for White, Black, and racially ambiguous Black—White faces among White children 4–9 years in age—the age range in which White children typically begin to exhibit racial essentialism. We hypothesized that the degree to which children exhibit use of racial essentialism should be associated with a view of race as less continuous and more categorical, ultimately manifesting in poorer memory for racially ambiguous faces.

The own-race bias (i.e., better memory for ingroup compared with outgroup faces) is well formed among White children 4-9 years old (e.g., Chance, Turner, & Goldstein, 1982; Sangrigoli & de Schonen, 2004a) and appears stable in this population from 6 years of age on (De Heering, De Liedekerke, Deboni, & Rossion, 2010). This work suggests that children, like adults, should exhibit the typical own-race bias for clear racial group members but is silent with regard to children's memory for racially ambiguous faces. We predicted children's essentialist thinking should be related to their memory for racially ambiguous but not unambiguous ingroup or outgroup faces. Specifically, we predicted that White children who do not use essentialist reasoning about race would remember both White and racially ambiguous faces better than they remembered Black faces because they would view ambiguously raced faces-which straddle the White-Black color line—more flexibly. Yet, we also predicted that those who used essentialist reasoning about race would adhere to more rigid distinctions regarding racial groups and would exhibit superior recognition for White faces over both racially ambiguous and Black faces.

Method

Participants and Design

A total of 89 White children were recruited from two schools and a museum science center in the greater Boston area. Parents were informed about the study, including its focus on racial perceptions, either from a letter sent home by the school administration (35% response rate) or through an in-person invitation to participate at the science center (80% response rate). We used an a priori exclusion criterion based on the idea that children who showed memory at chance levels across all face types during the memory task either were not paying attention or found the task was too difficult. Thus, data from 13 participants were excluded. Additionally, two other children were excluded who used a response pattern (i.e., alternating right face, left face) during the recognition phase. These exclusions resulted in a final sample of 74 White children (45 female) between the ages of 4 and 9 years (M = 5.96years, SD = 1.50). Children were recruited from two schools (n =21) and from a local science museum (n = 53). On the basis of parent-reported demographics from the schools and the science center's data on the average visitor to their center, approximately 64% of our participants were from families earning \$75,000 or more a year and approximately 73% were from families whose parents had at least a college degree. The study used a 3 (race of target face: White, Black, and ambiguous) × 2 (racial essentialism: yes or no) mixed-model design with repeated measures on the first factor.

Measures and Procedure

For participants recruited from schools, parents were asked to complete an optional demographic form that asked them to specify their child's racial background. At the science center, parents were asked this question in person. After receiving parental consent, the experimenter asked for children's verbal assent and made clear that they could stop the study at any point. Children completed the study on a computer that was separate from the classroom or separate from other children at the science center. Each participant completed two tasks: a face memory task and a racial essentialism assessment. To avoid carryover effects from tasks that were specifically about race (e.g., racial essentialism), the memory task always came first to minimize suspicion about the hypothesis.

Memory task. We used the face recognition procedure used in Pauker et al. (2009) on adults but with fewer faces to make it easier for children. Participants were told that they were going to play a memory game and that they would receive stickers in exchange for participating. The experimenter told the children to pay close attention to each face and explained that they would be asked to say which faces they had seen before.

A subset of Pauker et al.'s (2009) computer-generated White, Black, and racially ambiguous (Black–White) adult faces was used as stimuli. All of the faces were previously pretested to ensure they were prototypical of White or Black faces or fell in between and were perceived as truly ambiguous. All of the faces depicted neutral facial expressions and were equated for attractiveness (see

Pauker et al., 2009). Faces varied with respect to both skin color and other features prototypically associated with White and Black faces (e.g., shape of lips). The task included two phases. During the learning phase, participants viewed four White faces, four Black faces, and four ambiguous Black–White faces (hereafter called *target faces*). An equal number of male and female faces were included in each racial category. Each target face was adjusted to uniform size and resolution (500×500 pixels; 3.5×3 in.; 153 pixels/in.) and was shown in a randomized order for 5,000 ms, followed by a fixation cross with an intertrial interval of 1,010 ms.

After completing the learning phase, participants were asked a few distracter questions (e.g., "What are you doing this weekend?" "What have you seen at the museum so far?"). In the recognition phase, participants were shown the 12 target faces from the learning phase in addition to 12 foil faces: four White, four Black, and four racially ambiguous, all of which were gender balanced. The foil faces were shown next to a target face of the same race and gender, and these pairings were displayed in a random order. During the recognition phase, children were instructed that they would see two faces, one on the right side and one on the left side of the screen, and that they should both point to the face that they had seen before and press the L key if the face was on the left and the R key if the face was on the right. These keys were clearly labeled with stickers to minimize confusion. No feedback on accuracy was provided. The dependent measure of interest was recognition memory (measured by d').

Racial essentialism. After the memory task, participants completed a short three-item racial essentialism measure, adapted from previous tasks, that examined children's beliefs about immutability of category membership (Hirschfeld, 1995; Ruble et al., 2007; Semaj, 1980). Participants were first shown three faces (all photos were matched to the child's gender): One was either a Black or a White child whose photo was placed above that of a Black adult and a White adult. The experimenter asked, "When this child grows up, will they look more like this adult [White] or that adult [Black]?" (the order of the adult photos was counterbalanced across all participants). Next, participants viewed a similar picture array except they saw either a Black or a White adult pictured above a Black child and a White child (in counterbalanced order). The experimenter then asked, "When this adult was little, did they look more like this child [White] or that child [Black]?" Finally, the experimenter pointed to a picture of a White child and asked, "If this child really wanted to be Black and change his/her skin color could he/she do that?" To uncover their reasoning, the experimenter then asked children to explain why they believed that the child could or could not change his or her racial group membership. Children were categorized as having essentialist thinking about race if they (a) correctly made a race match in the first two questions and answered "no" to the last question, indicating that they believe race is both stable across the lifespan and immutable, and (b) used essentialist reasoning in their explanation for why someone could not change their skin color by referencing either immutability (e.g., "black skin stays forever"), inheritability or biology (e.g., "you stay the same because you are born that way"), or naturalness (e.g., "can't change his skin, he was made that way"; see Pauker, Ambady, & Apfelbaum, 2010, and Ruble et al., 2007, for similar methods and coding strategies). If children did not provide reasoning for their answer or if that reasoning did not 4 GAITHER ET AL.

fall into any of the above categories (i.e., reasoning such as "they like being that way"), children were coded as non-racially essentialist. In other words, children needed to answer all questions correctly and provide essentialist reasoning to be coded as having racial essentialism.

Hirschfeld (1995) argued that some work underestimates children's understanding of race as an unchanging, biologically based category because it uses hard-to-understand tasks. To avoid such issues, we modeled our measure on those that examine natural changes over the lifespan (i.e., growth) with a couple of key additions. First, we used real pictures as our stimuli. Past research has mostly used drawings (e.g., Giménez & Harris, 2002; Hirschfeld, 1995), which may limit the generalizability of the findings (e.g., maybe children do not conceptualize drawings in the same way that they do actual people). Second, we probed for children's self-produced reasoning about whether a change in racial group membership is possible and coded for explanations consistent with essentialist beliefs: that a category is stable, unchanging, likely to be present at birth, natural, and biologically based. Examining children's social reasoning in this way provides valuable insight into children's understandings of concepts not available through simple forced-choice measures (e.g., Giménez & Harris, 2002; Killen & Stangor, 2001; Taylor, Rhodes, & Gelman, 2009). This measure of racial essentialism has been used in past research and reliably relates to children's racial stereotyping (Pauker et al., 2009). On the basis of this task, children were divided into two groups: nonessentialist and essentialist. After all the tasks were completed, children chose some stickers as a reward for participating.

Results

Data Transformation

We calculated d' scores using the proportion of correct choices from the face recognition task. Since this was a two-alternative forced choice (2AFC) paradigm, we used the following formula to calculate d': z score [proportion correct] $\times \sqrt{2}$ (Macmillan & Creelman, 2005). When proportion correct is equal to 1 or 0, no z score can be calculated; therefore, we calculated corrected proportions that were based on the number of signal or noise trials (n = 4; Stanislaw & Todorov, 1999). When the proportion correct equaled 0, the value was recoded as 0.5/n, and when the proportion correct equaled 1, the value was recoded as 1 - (0.5/n). No differences were found relating to either participant gender or the gender of stimuli, so analyses were collapsed across these variables.

Recognition Performance and Racial Essentialism

To test our hypotheses, we compared memory for the target faces between children with essentialist reasoning (n=35; 19 female) and those without essentialist reasoning (n=39; 26 female). We ran a 3 (target race: White, Black, and ambiguous) \times 2 (racial essentialism: yes or no) mixed-model analysis of variance on the measure of face recognition memory: the mean d' scores. There was a significant interaction between target race and racial essentialism, F(2, 144) = 3.76, p < .03, $\eta^2 = .050$, and a main effect only for target race, F(2, 144) = 4.06, p < .02, $\eta^2 = .053$

(see Figure 1). To further examine the differences in memory associated with essentialist thinking, planned contrasts were conducted on the d' scores for White, Black, and racially ambiguous faces for children with and without racial essentialist reasoning. As predicted (and similar to adults in prior research), children with essentialist beliefs remembered White faces (M=.96, SD=.78) significantly better than they did both ambiguous (M=.30, SD=.78) and Black faces (M=.49, SD=1.0), t(144)=3.05, p<.002, r=.25. In comparison, children without essentialist beliefs remembered both White (M=.63, SD=.82) and ambiguous (M=.72, SD=.64) faces better than they did Black faces (M=.28, SD=1.1), t(144)=2.25, p<.02, r=.18. Furthermore, children without essentialist beliefs recognized ambiguous faces significantly better than did children with essentialist beliefs, t(144)=2.01, p<.03, r=.17.

We examined race essentialism and memory over a wide age range, under the assumption that we should find considerable variability in race essentialism in this age range, presumably with more essentialist reasoning occurring as children got older. We found only moderate support for this premise. Although there was variability in essentialist reasoning in this age range, there were no significant differences in the average age of children who exhibited (M = 6.13, SD = 1.16) or did not exhibit (M = 5.80, SD = 1.16)1.75) essentialist reasoning. On the basis of prior research that found 6-year-olds typically displayed essentialist reasoning (Pauker, Ambady, & Apfelbaum, 2010), we also compared use of essentialism in 4- to 5-year-olds and 6- to 9-year-olds. A greater proportion of older (6- to 9-year-old) children (60.5%) used essentialism compared with younger (4- to 5-year-old) children $(29\%), \chi^2(1) = 0.714, p = .008$. Together with the prior analysis, support for clear age differences in essentialist reasoning in our study is inconclusive at best. However, an additional analysis controlling for age as a variable did not change any of the above memory effects, nor did it interact with racial essentialism or target race of the stimuli.

Discussion

This is the first study, to our knowledge, to relate essentialist thinking about race to memory for racially ambiguous faces among

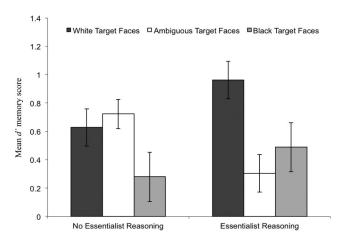


Figure 1. Mean d' memory score by target face race for children without and with essentialist reasoning about race. Error bars denote standard errors.

children. As hypothesized, the emergence of racial essentialist reasoning in White children was associated with significant decrements in memory for racially ambiguous faces. Linking this to perception, as White children start to essentialize race, they are more likely to perceive racial boundaries as distinct, decreasing their ability to recognize racially ambiguous faces. This highlights one social cognitive pathway that may contribute to the development of the own-race bias as it applies toward racially ambiguous faces: changes in conceptions of race. Although alternative interpretations of the relationship between racial essentialism and memory are possible, we argue that as children become less flexible in how they think about social categories, they come to perceive racially ambiguous faces in the same way that they do other racial outgroup faces, resulting in their poorer recognition. Our results replicate past studies with White children in that the own-race bias was robust for unambiguous ingroup and outgroup members, which converges with findings in adults: Essentialist beliefs seem to only affect memory for those at the boundaries of group membership.

The results of this study supplement earlier findings whereby adults who score high on measures of essentialism remember racially ambiguous and clearly outgroup faces equally poorly (Pauker & Ambady, 2009; Pauker et al., 2011). Our results indicate that children without racial essentialism view racially ambiguous faces as more similar to their ingroup, because they recognize them better than clearly outgroup, Black faces. But after adopting a more essentialist perspective toward race, White children's category boundaries sharpen and become more distinct, and ambiguous faces become recognized less accurately. Researchers in future studies should explore specifically how racially ambiguous faces are processed differently as a result of emerging racial essentialism in addition to investigating the development of how children learn to distinguish both racial ingroup and racial outgroup members and racially ambiguous populations.

What is clear is that after attaining beliefs that the physical characteristics associated with race are stable, immutable, and biologically based, there is greater differentiation in memory between the ingroup and racially ambiguous targets. Perhaps obtaining a racial essentialist outlook not only marks a decline in the recognition of ambiguous faces but also marks a more clear delineation between the ingroup and all other groups. This possibility is supported by the fact that children with essentialist reasoning had the best recall for White faces overall. Past research has found that children's memory for ambiguous faces depends on a combination of perceptual features seen in the face and categorical knowledge that can influence the resolution of racial group membership (Shutts & Kinzler, 2007). Here, we argue that children may use this categorical information to a greater degree as they acquire essentialist thinking.

Alternatively, one might question why nonessentialist children would have different memory performance for ingroup and outgroup faces at all. In other words, if a child is nonessentialist, one could argue that this would indicate that the child should also not essentialize race for more prototypical outgroup members either (i.e., Black faces). Therefore, children's categorization of racially ambiguous faces as White or ingroup could be seen as just as essentialist as categorizing them as Black or outgroup. But it is known that White infants and children quickly develop a pro-White bias in visual and memory preferences very early on in

development, demonstrating that infants and young children appear to be adept at picking up ingroup and outgroup cues for easily identifiable group members even before they develop essentialist notions of race. It is true that greater memory for racially ambiguous faces could be interpreted as a higher tolerance for who is considered ingroup in our study, but, from our perspective, that is consistent with our argument. Racial essentialism impacts individuals' perceptions of their group boundaries and tolerance for including racially ambiguous individuals into the ingroup, which has direct implications for memory. We believe that categorizing faces as one's ingroup does not necessarily imply that these White children are categorizing the faces explicitly as White but rather that they are more likely to process them as more relevant to the self rather than merely disregarding those faces in memory. Furthermore, we do not have data to support whether children are simply categorizing racially ambiguous faces as another race. Therefore, we do not know if children are categorizing racially ambiguous faces explicitly as monoracial Black or White faces. We only know that children's memory performance for racially ambiguous faces is not significantly different from that of monoracial Black faces or White faces depending on whether they have adopted an essentialist view of race. This is something that we believe future research should address: What explicit labels do children apply to racially ambiguous faces and how does that affect perception and memory?

Although we focused here on the link between racial essentialism and memory for same-race, other-race, and racially ambiguous faces, other factors may also contribute to children's face recognition abilities. Children's experience with other-race faces has been shown to predict their facial memory for unambiguous racial groups. Infants and children who are exposed to additional exemplars of other-race faces (e.g., Heron-Delaney et al., 2011; Sangrigoli & de Schonen, 2004b), who live in more racially mixed neighborhoods, or who attend more integrated schools show a decrease in the own-race bias (Cross, Cross, & Daly, 1971; Feinman & Entwisle, 1976; Gaither, Pauker, & Johnson, 2012; Sangrigoli, Pallier, Argenti, Ventureyra, & de Schonen, 2005). Therefore, children's lack of exposure to ambiguous and other-race faces may affect these outcomes. Although our sample included children who grew up in urban and racially diverse environments, future researchers should further explore this question.

Minority children might also show different patterns of memory because their differential awareness of race may affect when racial essentialism emerges (e.g., Kinzler & Dautel, 2012; Phinney, 1992; Rockquemore & Laszloffy, 2005). Additionally, past studies have also found slightly weaker own-race bias effects in minority children in comparison to White children (e.g., Cross et al., 1971; Feinman & Entwisle, 1976). Multiracial children may also differ in terms of their patterns of memory, because they might be likely to develop less essentialist beliefs about race. Research with adults has found that biracial adults endorse less essentialist thinking than do their monoracial counterparts (Bonam & Shih, 2009; Pauker & Ambady, 2009; Shih, Bonam, Sanchez, & Peck, 2007). Clearly, to gain a more complete picture of the role racial essentialism plays in children's memory for racially ambiguous and outgroup faces, future research is needed to examine participants from a wider range of racial identities. Additionally, the majority of our participants were from upper-middle to upper-class families, so future 6 GAITHER ET AL.

work should also examine whether these results generalize to children from other socioeconomic backgrounds.

Finally, in the present work, we specifically examined memory performance for White, Black, and racially ambiguous Black-White faces. We selected these groups for this study because the specific history of Black-White relations in the United States makes Black individuals a highly salient racial category for White children around which they readily form implicit biases (Baron & Banaji, 2006). However, it is unclear whether racial essentialism would relate to children's memory in a similar manner for other types of racially ambiguous faces. Research with adults shows that the boundary for categorizing faces as White or minority depends on the current racial hierarchy in the United States, such that individuals must have considerably more evidence to categorize a Black-White biracial individual as White compared with an Asian-White biracial individual (Ho et al., 2011). On the basis of these findings with adults, it is entirely possible that the current results might be less pronounced if we examined children's memory for Asian-White racially ambiguous faces. However, this conjecture is in need of direct empirical assessment.

Complementing the role of emerging racial essentialism in the onset of stereotype use and more biased attitudes (e.g., Pauker, Ambady, & Apfelbaum, 2010; Ruble et al., 2004; Semaj, 1980), our findings demonstrate that emerging racial essentialism likely relates to more basic social perceptions of race: poor memory for racially ambiguous faces in children (an effect that resembles biases seen in adulthood; e.g., Pauker et al., 2009). Racial essentialist reasoning negatively predicts memory for racially ambiguous individuals, and children overlook racially ambiguous individuals in memory to the same extent that they overlook other outgroup members. These facts highlight the need for additional research on the perception and judgment of racially ambiguous children—one of the fastest growing populations in contemporary society.

References

- Aboud, F. E. (1984). Social and cognitive bases of ethnic identity constancy. *The Journal of Genetic Psychology: Research and Theory on Human Development*, 145, 217–229. doi:10.1080/00221325.1984.10532269
- Baron, A. S., & Banaji, M. R. (2006). The development of implicit attitudes: Evidence of race evaluations from ages 6, 10, and adulthood. *Psychological Science*, 17, 53–58. doi:10.1111/j.1467-9280.2005.01664.x
- Bonam, C. M., & Shih, M. (2009). Exploring multiracial individuals' comfort with intimate interracial relationships. *Journal of Social Issues*, 65, 87–103. doi:10.1111/j.1540-4560.2008.01589.x
- Chance, J. E., Turner, A. L., & Goldstein, A. G. (1982). Development of differential recognition for own- and other-race faces. *The Journal of Psychology: Interdisciplinary and Applied*, 112, 29–37. doi:10.1080/ 00223980.1982.9923531
- Chao, M. M., Hong, Y., & Chiu, C. (2013). Essentializing race: Its implications on racial categorization. *Journal of Personality and Social Psychology*, 104, 619–634. doi:10.1037/a0031332
- Corneille, O., Huart, J., Becquart, E., & Brédart, S. (2004). When memory shifts toward more typical category exemplars: Accentuation effects in the recollection of ethnically ambiguous faces. *Journal of Personality* and Social Psychology, 86, 236–250. doi:10.1037/0022-3514.86.2.236

- Cross, J. F., Cross, J., & Daly, J. (1971). Sex, race, age, and beauty as factors in recognition of faces. *Perception & Psychophysics*, 10, 393– 396. doi:10.3758/BF03210319
- Davis, F. J. (1991). Who is Black? One nation's definition. University Park: Pennsylvania State University Press.
- De Heering, A., De Liedekerke, C., Deboni, M., & Rossion, B. (2010). The role of experience during childhood in shaping the other-race effect. Developmental Science, 13, 181–187. doi:10.1111/j.1467-7687.2009 00876 x
- Eberhardt, J. L., Dasgupta, N., & Banaszynski, T. L. (2003). Believing is seeing: The effects of racial labels and implicit beliefs on face perception. *Personality and Social Psychology Bulletin*, 29, 360–370. doi: 10.1177/0146167202250215
- Feinman, S., & Entwisle, D. R. (1976). Children's ability to recognize other children's faces. *Child Development*, 47, 506–510. doi:10.2307/ 1128809
- Freeman, J., Pauker, K., Apfelbaum, E., & Ambady, N. (2010). Continuous dynamics in the real-time perception of race. *Journal of Experimental Social Psychology*, 46, 179–185. doi:10.1016/j.jesp.2009.10.002
- Gaither, S. E., Pauker, K., & Johnson, S. P. (2012). Biracial and monoracial infant own-race face perception: An eye tracking study. *Developmental Science*, 15, 775–782. doi:10.1111/j.1467-7687.2012.01170.x
- Gelman, S. A. (2003). The essential child: Origins of essentialism in everyday thought. Oxford, United Kingdom: Oxford University Press. doi:10.1093/acprof:oso/9780195154061.001.0001
- Gelman, S. A., & Wellman, H. M. (1991). Insides and essences: Early understandings of the non-obvious. *Cognition*, 38, 213–244. doi: 10.1016/0010-0277(91)90007-Q
- Giménez, M., & Harris, P. L. (2002). Understanding constraints on inheritance: Evidence for biological thinking in early childhood. *British Journal of Developmental Psychology*, 20, 307–324. doi:10.1348/ 026151002320620262.
- Halberstadt, J., Sherman, S. J., & Sherman, J. W. (2011). Why Barack Obama is Black: A cognitive account of hypodescent. *Psychological Science*, 22, 29–33. doi:10.1177/0956797610390383
- Haslam, N., Rothschild, L., & Ernst, D. (2000). Essentialist beliefs about social categories. *British Journal of Social Psychology*, 39, 113–127. doi:10.1348/014466600164363
- Haslam, N., Rothschild, L., & Ernst, D. (2002). Are essentialist beliefs associated with prejudice? *British Journal of Social Psychology*, 41, 87–100. doi:10.1348/014466602165072
- Heron-Delaney, M., Anzures, G., Herbert, J. S., Quinn, P. C., Slater, A. M., Tanaka, J. W., . . . Pascalis, O. (2011). Perceptual training prevents the emergence of the other race effect during infancy. *PLoS ONE*, 6, Article e19858. doi:10.1371/journal.pone.0019858
- Hirschfeld, L. A. (1995). Do children have a theory of race? *Cognition*, *54*, 209–252. doi:10.1016/0010-0277(95)91425-R
- Ho, A. K., Sidanius, J., Levin, D. T., & Banaji, M. R. (2011). Evidence for hypodescent and racial hierarchy in the categorization and perception of biracial individuals. *Journal of Personality and Social Psychology*, 100, 492–506. doi:10.1037/a0021562
- Hugenberg, K., Young, S. G., Bernstein, M. J., & Sacco, D. F. (2010). The categorization-individuation model: An integrative account of the cross race recognition deficit. *Psychological Review*, 117, 1168–1187. doi: 10.1037/a0020463
- Jayaratne, T. E., Ybarra, O., Sheldon, J. P., Brown, T. N., Feldbaum, M., Pfeffer, C. A., & Petty, E. M. (2006). White Americans' genetic lay theories of race differences and sexual orientation: Their relationship with prejudice toward Blacks, and gay men and lesbians. Group Processes & Intergroup Relations, 9, 77–94. doi:10.1177/1368430206059863
- Kalish, C. W. (2002). Essentialist to some degree: Beliefs about the structure of natural kind categories. *Memory & Cognition*, 30, 340–352. doi:10.3758/BF03194935

- Keller, J. (2005). In genes we trust: The biological component of psychological essentialism and its relationship to mechanisms of motivated social cognition. *Journal of Personality and Social Psychology*, 88, 686–702. doi:10.1037/0022-3514.88.4.686
- Killen, M., & Stangor, C. (2001). Children's social reasoning about inclusion and exclusion in gender and race peer groups contexts. *Child Development*, 72, 174–186. doi:10.1111/1467-8624.00272
- Kinzler, K. D., & Dautel, J. B. (2012). Children's essentialist reasoning about language and race. *Developmental Science*, 15, 131–138. doi: 10.1111/j.1467-7687.2011.01101.x
- Levy, S. R., & Dweck, C. S. (1999). The impact of children's static versus dynamic conceptions of people on stereotype formation. *Child Development*, 70, 1163–1180. doi:10.1111/1467-8624.00085
- Levy, S. R., Stroessner, S. J., & Dweck, C. S. (1998). Stereotype formation and endorsement: The role of implicit theories. *Journal of Personality* and Social Psychology, 74, 1421–1436. doi:10.1037/0022-3514.74.6 .1421
- Macmillan, N. A., & Creelman, C. D. (2005). Detection theory: A user's guide (2nd ed.). Mahwah, NJ: Erlbaum.
- Maddox, K. B., & Gray, S. A. (2002). Cognitive representations of Black Americans: Reexploring the role of skin tone. *Personality and Social Psychology Bulletin*, 28, 250–259. doi:10.1177/0146167202282010
- Markus, H. R. (2008). Pride, prejudice, and ambivalence: Toward a unified theory of race and ethnicity. *American Psychologist*, 63, 651–670. doi:10.1037/0003-066X.63.8.651
- Medin, D. L., & Ortony, A. (1989). Comments on Part I: Psychological essentialism. In S. Vosniadou & A. Ortony (Eds.), Similarity and analogical processing (pp. 179–196). New York, NY: Cambridge University Press. doi:10.1017/CBO9780511529863.009
- Meissner, C. A., & Brigham, J. C. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Psychology*, *Public Policy*, and Law, 7, 3–35. doi:10.1037/1076-8971.7.1.3
- Pauker, K., & Ambady, N. (2009). Multiracial faces: How categorization affects memory at the boundaries of race. *Journal of Social Issues*, 65, 69–86. doi:10.1111/j.1540-4560.2008.01588.x
- Pauker, K., Ambady, N., & Apfelbaum, E. (2010). Race salience and essentialist thinking in racial stereotype development. *Child Development*, 81, 1799–1813. doi:10.1111/j.1467-8624.2010.01511.x
- Pauker, K., Rule, N. O., & Ambady, N. (2010). Ambiguity and social perception. In E. Balcetis & D. Lassiter (Eds.), Social psychology of visual perception (pp. 7–26). New York, NY: Psychology Press.
- Pauker, K., Weisbuch, M., & Ambady, N. (2011, January). I'm comfortable with racial ambiguity when it's functionally important: Environmental constraints on processing racial ambiguity. In K. Savani & M. Weisbuch (Chairs), Manifest culture: An analysis of the psychological basis and influence of sociocultural landscapes. Symposium conducted at the 12th Annual Meeting of the Society for Personality and Social Psychology, San Antonio, TX.
- Pauker, K., Weisbuch, M., Ambady, N., Sommers, S. R., Adams, R. B., Jr., & Ivcevic, Z. (2009). Not so Black and White: Memory for ambiguous group members. *Journal of Personality and Social Psychology*, 96, 795–810. doi:10.1037/a0013265
- Peery, D., & Bodenhausen, G. V. (2008). Black + White = Black: Hypodescent in reflexive categorization of racially ambiguous faces. *Psychological Science*, *19*, 973–977. doi:10.1111/j.1467-9280.2008 .02185.x
- Phinney, J. (1992). The multigroup ethnic identity measure: A new scale for use with diverse groups. *Journal of Adolescent Research*, 7, 156– 176. doi:10.1177/074355489272003
- Plaks, J. E., Malahy, L. W., Sedlins, M., & Shoda, Y. (2012). Folk beliefs about human genetic variation predict discrete versus continuous racial categorization and evaluative bias. *Social Psychological & Personality Science*, 3, 31–39. doi:10.1177/1948550611408118

- Rhodes, M., & Gelman, S. A. (2009). A developmental examination of the conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cognitive Psychology*, 59, 244–274. doi: 10.1016/j.cogpsych.2009.05.001
- Rockquemore, K. A., & Laszloffy, T. A. (2005). *Raising biracial children*. Lanham, MD: AltaMira Press.
- Rothbart, M., & Taylor, M. (1992). Category labels and social reality: Do we view social categories as natural kinds? In G. R. Semin & K. Fiedler (Eds.), Language and social cognition (pp. 11–36). London, United Kingdom: Sage.
- Ruble, D. N., Alvarez, J., Bachman, M., Cameron, J., Fuligni, A., & Coll, C. G. (2004). The development of a sense of "we": The emergence and implications of children's collective identity. In M. Bennett & F. Sani (Eds.), *The development of the social self* (pp. 29–76). East Sussex, United Kingdom: Psychology Press.
- Ruble, D. N., Taylor, L. J., Cyphers, L., Greulich, F. K., Lurye, L. E., & Shrout, P. E. (2007). The role of gender constancy in early gender development. *Child Development*, 78, 1121–1136. doi:10.1111/j.1467-8624.2007.01056.x
- Sangrigoli, S., & de Schonen, S. (2004a). Effect of visual experience on face processing: Developmental study of inversion and non-native effects. *Developmental Science*, 7, 74–87. doi:10.1111/j.1467-7687.2004 .00324.x
- Sangrigoli, S., & de Schonen, S. (2004b). Recognition of own-race and other-race faces by three month old infants. *Journal of Child Psychology* and Psychiatry, 45, 1219–1227. doi:10.1111/j.1469-7610.2004.00319.x
- Sangrigoli, S., Pallier, C., Argenti, A.-M., Ventureyra, V. A. G., & de Schonen, S. (2005). Reversibility of the other-race effect in face recognition during childhood. *Psychological Science*, 16, 440–444. doi: 10.1111/j.0956-7976.2005.01554.x
- Semaj, L. T. (1980). The development of racial evaluation and preference: A cognitive approach. *Journal of Black Psychology*, 6, 59–79. doi: 10.1177/009579848000600201
- Shih, M., Bonam, C., Sanchez, D., & Peck, C. (2007). The social construction of race: Biracial identity and vulnerability to stereotypes. *Cultural Diversity and Ethnic Minority Psychology*, 13, 125–133. doi: 10.1037/1099-9809.13.2.125
- Shutts, K., & Kinzler, K. (2007). An ambiguous-race illusion in children's face memory. *Psychological Science*, 18, 763–767. doi:10.1111/j.1467-9280.2007.01975.x
- Stanislaw, H., & Todorov, N. (1999). Calculation of signal detection theory measures. *Behavior Research Methods, Instruments, & Computers, 31*, 137–149. doi:10.3758/BF03207704
- Taylor, M. G. (1996). The development of children's beliefs about social and biological aspects of gender differences. *Child Development*, *67*, 1555–1571. doi:10.1111/j.1467-8624.1996.tb01814.x
- Taylor, M. G., Rhodes, M., & Gelman, S. A. (2009). Boys will be boys; cows will be cows: Children's essentialist reasoning about gender categories and animal species. *Child Development*, 80, 461–481. doi: 10.1111/j.1467-8624.2009.01272.x
- Williams, M. J., & Eberhardt, J. L. (2008). Biological conceptions of race and the motivation to cross racial boundaries. *Journal of Personality and Social Psychology*, 94, 1033–1047. doi:10.1037/0022-3514.94.6.1033
- Yzerbyt, V., Rocher, S., & Schadron, G. (1997). Stereotypes as explanations: A subjective essentialistic view of group perception. In R. Spears, P. J. Oakes, N. Ellemers, & S. A. Haslam (Eds.), The social psychology of stereotyping and group life (pp. 20–50). Cambridge, United Kingdom: Blackwell.

Received May 29, 2012
Revision received February 19, 2013
Accepted April 18, 2013