Do Children See in Black and White? Children's and Adults' Categorizations of Multiracial Individuals

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Categorizations of multiracial individuals provide insight into the development of racial concepts. Children's (4–13 years) and adults', both White (Study 1) and Black (Study 2; N = 387), categorizations of multiracial individuals were examined. White children (unlike Black children) more often categorized multiracial individuals as Black than as White in the absence of parentage information. White and Black adults (unlike children) more often categorized multiracial individuals as Black than as White, even when knowing the individuals' parentage. Children's rates of in-group contact predicted their categorizations. These data suggest that a tendency to categorize multiracial individuals as Black relative to White emerges early in development and results from perceptual biases in White children but ideological motives in White and Black adults.

In the United States, Black–White multiracial individuals are often categorized as *multiracial* (or as Black *and* White, but not Black *or* White) when that option is available (Chen & Hamilton, 2012; Peery & Bodenhausen, 2008). However, when they are not categorized as such, they are more likely to be categorized as Black than as White (e.g., Ho, Sidanius, Levin, & Banaji, 2011; Krosch, Berntsen, Amodio, Jost, & Van Bavel, 2013). Psychologists have explored how adults' social and cognitive ideologies undergird these categorizations (Chen, Moons, Gaither, Hamilton, & Sherman, 2014; Halberstadt, Sherman, & Sherman, 2011; Ho, Sidanius, Cuddy, & Banaji, 2013; Krosch & Amodio, 2014; Krosch et al., 2013; Skinner & Nicolas, 2015). There has been much less work on this issue from a developmental perspective, particularly to assess the perceptual and ideological underpinnings of the information children use when categorizing mul-

tiracial individuals, and how these underpinnings reflect children's own racial group membership and social experiences. The goal of the present research was to examine these issues in children (ages 4–13) and adults. We focused on the categorizations of multiracial individuals with one Black and one White parent (henceforth referred to as "multiracial individuals"), given the unique history of "Black" and "White" as categories in U.S. society (see Davis, 1991). This issue is of theoretical importance, as categorizations of multiracial individuals illuminate cognitive processes involved in overlapping and nondiscrete racial categorizations. This issue is also of societal importance, because it stands to further our understanding of the experiences of an understudied yet growing demographic group.

A Brief U.S. History of Categorizations of Multiracial Individuals

During the 18th and 19th centuries, several states in United States imposed a graded racial category system in which *mulattoes* (i.e., "hybrids" in Spanish, referring to the offspring of one Black and one White parent) were not categorized as either Black or White, but rather, as members of an "in-between" group (Davis, 1991; Morning, 2005). Some states, particularly those in the South, worried that an in-between category would blur the social boundaries between Black and White people and

thereby challenge the distinction between enslaved and free people. In an attempt to maintain slavery and keep social groups discrete, several states enforced "one-drop rules." These "rules" varied across states (reflecting their arbitrary nature). In Virginia, for instance, people with traces of "Black blood" (hence, the reference to "one drop" of blood) were categorized as *Negro* (i.e., hypodescent; whereby people are categorized as members of their socially subordinate parent group), whereas in South Carolina, there are documented instances of people with traces of "White blood" being categorized as *White* (i.e., hyperdescent; whereby people are categorized as members of their socially dominant group; Davis, 1991). Thus, a person with Black and White heritage could have been categorized as *Negro* in Virginia and as *White* in South Carolina. In the early 20th century, census enumerators enforced hypodescent nationally, such that people with Black and White heritage were categorized as *Negro* regardless of their state of residence, heritage, or own identity. This practice persisted until the 2000 U.S. Census permitted people to identify with multiple racial categories. Since this change, the number of Americans who identified with two or more racial categories increased from 6.8 million in 2000 to over 9 million in 2010 (U.S. Census, 2011), and this number has been projected to reach 21% of Americans by 2050 (Smith & Edmonston, 1997).

U.S. Adults' Categorizations of Multiracial Individuals

When given the option, today's U.S. adults often categorize multiracial individuals as belonging to multiple racial groups (e.g., Black *and* White, not exclusively Black *or* White; e.g., Chen & Hamilton, 2012; Chen et al., 2014). For instance, Peery and Bodenhausen (2008) found that when adults were given racial labels to choose from, background information that highlighted multiracial individuals' parentage, and time to make thoughtful responses, they categorized multiracial individuals as multiracial more often than as Black or White.

Nonetheless, several studies suggest that although U.S. adults understand and use "multiracial" as a category, they are still more likely to perceive multiracial individuals as Black than as White (e.g., Ho et al., 2011; Krosch & Amodio, 2014; Krosch et al., 2013; Peery & Bodenhausen, 2008). There are two distinct explanations for such results: a *perceptual bias* or *hypodescent* (both of which could be operating). Some have hypothesized that White adults display a perceptual bias, such that people first learn about familiar in-group features and that

they subsequently dedicate greater attention to less familiar out-group features (Halberstadt et al., 2011). By virtue of being a majority, White adults typically have less out-group contact and fewer opportunities to learn about out-group features. As a learning strategy, White adults dedicate greater attention to out-group features and thus, when presented with someone with in-group *and* out-group features, they overweigh out-group features and subsequently categorize the person as an out-group member (e.g., Black).

Yet, a perceptual bias alone cannot account for the tendency to categorize multiracial individuals as Black, because this tendency persists even in the presence of racial labels and parentage information, and in the absence of perceptual information (e.g., Ho et al., 2013; Peery & Bodenhausen, 2008). Thus, another explanation is that adults are ideologically motivated to endorse hypodescent, such that when it is clear that a person has Black and White parents, they categorize that individual as Black and not White. For instance, Ho et al. (2011) found that when multiracial individuals were presented as having two White grandparents and two racial minority grandparents (and without images), White adults categorized them as more racial minority than White. This bias was stronger when adults categorized multiracial individuals with a stereotypically lower social status background (i.e., Black) compared to those with a stereotypically higher social status background (i.e., Asian), suggesting that White adults used hypodescent to exclude multiracial individuals from the in-group and maintain boundaries between themselves and low-status groups. Indeed, White adults who are politically conservative, oriented toward social dominance, under conditions of economic scarcity, or high in racial essentialism and intergroup biases tend to categorize multiracial individuals as Black and not White (e.g., Ho et al., 2013; Krosch & Amodio, 2014). Notably, in this article, we define hypodescent as the categorization of multiracial individuals as Black in the presence of parentage information. That is, one cannot endorse hypodescent (assigning a multiracial individual to the lower status parent group) without knowing what the actual parent groups are.

Research has not yet systematically tested how Black adults categorize multiracial individuals. Pauker et al. (2009) found that White adults remembered racially ambiguous faces to a lesser extent than faces of White adults (and to the same extent as faces of Black adults), suggesting that they categorized ambiguous faces and faces of Black

adults comparably. However, Black adults remembered racially ambiguous faces at an intermediate rate (i.e., not different from how they remembered faces of White adults or faces of Black adults). Although adults' memory for ambiguous faces need not reflect their categorizations, these results suggest that White adults and Black adults reason about multiracial individuals differently. Indeed, other work suggests that although Black adults may also categorize multiracial individuals as Black as a result of ideological motives, they may differ from White adults in doing so in order to include multiracial individuals in their in-group and to maintain the strength of the Black community (Davis, 1991). Davis (1991) noted how civil rights organizations, such as the National Association for the Advancement of Colored People (NAACP), openly opposed the Census option to permit Americans to mark off multiple racial categories, arguing that such an option would decrease the membership of the Black community and therewith the social justice benefits to which Black Americans are entitled (see also Morning, 2005). Indeed, Chen and Ratliff (2015) found that White adults transferred negative attitudes between Black and Black–White individuals (thereby perceiving them both as out-groups: Black), whereas Black adults did not (thereby perceiving them both as in-groups: Black).

Thus, although adults often categorize multiracial individuals as multiracial when given the option to do so (e.g., Chen & Hamilton, 2012), both White and Black adults may be ideologically motivated to categorize multiracial individuals as Black relative to White (e.g., White adults for *exclusion* purposes, Black adults for *inclusion* purposes; Davis, 1991). Little is known about how and when these categorizations emerge in development, which is unfortunate because an understanding of racial categorizations reveals important insights into the development of intergroup attitudes, stereotyping, and prejudice (Bigler, Jones, & Lobliner, 1997).

U.S. Children's Categorizations of Multiracial Individuals

Gaither et al. (2014) found that 4- to 9-year-old White children remembered faces of White adults more often than faces of Black and racially ambiguous adults, suggesting that they associated faces of Black and racially ambiguous adults with their out-group. However, this bias was more evident in children with relatively higher levels of racial essentialism (i.e., the belief that racial categories are stable and inalterable). Similarly, Shutts and Kinzler

(2007) found that when racially ambiguous adult faces were displayed with Black siblings (as opposed to White siblings), 2- to 5-year-old White children showed decreased memory performance, suggesting that they were less likely to remember faces of racially ambiguous adults that were associated with their out-group. Thus, White children, like White adults (Pauker et al., 2009), have difficulty remembering faces of racially ambiguous adults, and this difficulty may stem from associating those faces with their out-group.

However, children's memory for ambiguous faces does not necessarily parallel their categorizations. Research suggests that White children show perceptual biases when multiracial individuals are presented without identifying information (e.g., racial labels). As a result of being in the majority, White children, like White adults, typically first learn about in-group features and subsequently dedicate more attention to the less frequent and less familiar out-group features (Anzures et al., 2013; Bar-haim, Ziv, Lamy, & Hodes, 2006). Thus, when White U.S. children perceive a multiracial individual, they may overweigh features that they associate with Black individuals (e.g., relatively darker skin tone) and subsequently categorize the individual as Black. This overweighing may increase with age, because young children typically pay attention to skin color, whereas older children additionally attend to other physical features associated with race (e.g., nose width; Dunham, Stepanova, Dotsch, & Todorov, 2014). Indeed, Dunham, Chen, and Banaji (2013) asked 3- to 14-year-old children to categorize racially ambiguous faces with happy or angry expressions as Black or as White, and found that with each year of age, children were increasingly likely to categorize ambiguous faces as Black than as White (see p. 864).

Black children, by virtue of being in the minority in the United States, typically have more in-group contact with minorities and more out-group contact than White children, and for this reason are less likely to overweigh minority or majority features as differentially salient (Anzures et al., 2013). Additionally, Black children often show fewer intergroup biases, perhaps due to greater out-group contact, but also due to having internalized status hierarchies from the larger society that privilege members of majority groups (Newheiser & Olson, 2012). For both of these reasons (less perceptual bias in weighing facial features and less intergroup bias), Black children may not exhibit categorization biases when multiracial faces are presented ambiguously. In support of this, Dunham et al. (2013) examined

Black children's (aged 4–10) categorizations of multiracial individuals and found that unlike White children, they showed no bias to associate ambiguously presented angry Black–White faces with either the out-group or the in-group.

Do children, like adults, categorize multiracial individuals as Black even when it is clear that they have both Black and White parents (thereby reflecting hypodescent)? Children as young as 4 years of age can overlook perceptual features and use nonobvious information (e.g., inheritance) in their categorizations (Gelman, 2003). Unlike adults, however, children often base their racial categorizations on superficial features (e.g., skin color) and are unfamiliar with categorization practices that require historical, ideological, and cultural knowledge (e.g., hypodescent; Dunham et al., 2014; Quintana, 1998). For instance, although racial essentialism underlies adults' categorizations of multiracial individuals as Black (Chao, Hong, & Chiu, 2013), racial essentialism may not emerge robustly in children until around age 10 (Kinzler & Dautel, 2012; Rhodes & Gelman, 2009). Thus, children may simply use parentage information to avoid categorizing an individual with a Black and a White parent as Black or White. Although young children associate racial groups with different levels of social status (Olson, Shutts, Kinzler, & Weisman, 2012), and may therefore categorize individuals with a White and a Black parent in accordance with their Black parent (revealing hypodescent), we propose that they may not be ideologically motivated to do so.

Thus, whereas White and Black adults may categorize multiracial individuals as Black relative to White, both in the absence and in the presence of parentage information (as a result of an ideological motive to endorse hypodescent), White children (but not Black children) may only categorize multiracial individuals as Black in the absence of parentage information (as a result of attending to perceptual information). Indeed, Hirschfeld (1995) presented children and adults with images of multiracial families and asked them to infer whether the multiracial couple's child would be Black, White, or something else, and whether the child would resemble the Black parent, the White parent, or both parents equally. Adults endorsed hypodescent (predicting that the offspring would be Black), whereas fifth graders predicted that the offspring would be something else, but would resemble the Black parent, and second graders predicted that the offspring would share and resemble the mother's category. Thus, adults reasoned that the offspring of one Black parent and one White parent would be categorically Black, but older children conceptualized multiracial individuals as not wholly Black or White, and younger children relied on a race-of-mother strategy.

Using an indirect measure of intergroup contact (e.g., percentage of racial minorities in children's school and community), Hirschfeld (1995) found that both Black and White children living in relatively diverse contexts reasoned that multiracial individuals would be physically intermediate in appearance to their parents. As mentioned previously, White children living in predominantly White contexts may perceive Black features as less frequent, and thus more salient, and may therefore overweigh those features when categorizing racially ambiguous individuals with Black and White features (Halberstadt et al., 2011). In the present study, we examined how a more direct measure of group contact (i.e., racial makeup of each participant's friendship network and neighborhood) predicted participants' categorizations. Indirect measures of the racial demographics of children's immediate environment need not reflect their actual experiences with intergroup contact (e.g., Black children living in predominantly White contexts may still have more Black friends than White friends; Tatum, 1997).

The Present Studies

Our aim was to systematically investigate children's and adults' categorizations of multiracial individuals. Previous research on children's categorizations presented faces in a forced-choice manner (Dunham et al., 2013), thereby leaving unresolved the extent to which children categorize multiracial individuals as not wholly Black or wholly White. Moreover, previous research has not explored children's categorizations of multiracial individuals both in the absence and in the presence of parentage information, which was a primary focus in the present studies. Finally, previous research used computer-generated morphs (e.g., Dunham et al., 2013; Ho et al., 2011) or illustrations in which physical features were hidden (Hirschfeld, 1995). Chen and Hamilton (2012) showed that 50:50 blends of faces of Black and White adults were not representative of real faces (people are not physically intermediate to their parents) and were less likely than real faces to be categorized as Black or White.

We randomly assigned participants to one of two tasks: Parent-Absent task and Parent-Present task. The Parent-Absent task assessed racial categorizations when no parentage information was

provided. This task was designed to detect perceptual biases in the categorization of multiracial individuals. Specifically, we predicted that White children (but not Black children) would overweigh minority features and thus more often categorize multiracial faces as Black than as White. The Parent-Present task assessed racial categorizations when parentage information was provided. This task was designed to detect hypodescent. That is, when participants see that a person has one Black and one White parent, the hypodescent pattern is to categorize the person in accordance with the socially subordinate group (i.e., Black). In both tasks, participants were asked to indicate, for each of a series of girls depicted in photographs (henceforth referred to as targets), whether she was the same kind as a Black girl, a White girl, or another never-seen girl who was hidden behind a red curtain (see Rhodes, Gelman, & Karuza, 2014 for a similar method). We used this curtain method for two reasons: (a) it prevents participants from engaging in a perceptual matching strategy, and (b) it assesses children's beliefs regarding race-based category boundaries (Rhodes et al., 2014). No labels were provided for any of the pictures. In both tasks, participants who conceptualize multiracial targets as being not wholly Black or wholly White, but as something else, should categorize multiracial targets as more like the unseen exemplar behind the curtain. Study 1 tested U.S. White participants, and Study 2 tested U.S. Black participants. All participants were identified as monoracial White or monoracial Black. We expected that across both tasks, both White and Black adults would categorize multiracial targets as more Black than White as a result of ideological motives. In contrast, we expected that White children would only show this categorization bias in the absence of parentage information (as a result of overweighing minority features), and that Black children would not show this categorization bias on either task.

Study 1

Participants in Study 1 were White U.S. children and adults, for which we had several predictions. First, all age groups were predicted to match Black targets with the Black response option and White targets with the White response option more often than multiracial targets with the curtain. This finding would corroborate work with adults showing that categorizations of multiracial targets can be relatively more challenging than categorizations of

monoracial individuals, even for children (Chen et al., 2014). Second, consistent with Hirschfeld (1995), we predicted that in the presence of parent-age information, adults and children aged 10 years and older would match multiracial targets with the curtain more often than younger children, thereby indicating the reasoning that targets with Black and White heritage are not wholly Black or wholly White (see also Skinner & Nicolas, 2015). Third, because White adults are ideologically motivated to categorize multiracial targets as Black (e.g., Ho et al., 2013), we predicted that they would do so both in the absence and in the presence of parentage information (with the latter reflecting hypodescent). Fourth, because White children may overweigh minority features and categorize multiracial targets as Black (Anzures et al., 2013), we predicted that they would categorize multiracial targets as Black more often than as White in the Parent-Absent task. Also, we expected this bias to be higher in older age groups, given that children associate more physical features with race as they age (Dunham et al., 2014). In contrast, in the Parent-Present task, we reasoned that parentage information would serve as disambiguating information, and therefore did not expect children to be biased in the presence of parentage information. Fifth, we expected that increased in-group contact would predict children's tendency to categorize multiracial targets as Black, thereby indicating the role of social experiences in concepts of race. We included an age range of children ranging from 4 to 13, given that previous research shows that race-based concepts involving racial identity, essentialism, and stereotypes develop across these years (Bigler et al., 1997; Quintana, 1998; Rhodes & Gelman, 2009).

Method

Participants

White U.S. participants of four age groups were included ($N = 192$): forty-eight 4- to 6-year-olds (54% = female, M_{age} = 5;3 (years;months), range = 4;1–6;9), forty-eight 7- to 9-year-olds (58% = female, M_{age} = 8;4, range = 7;11–9;9), forty-eight 10- to 13-year-olds (56% = female, M_{age} = 11;3, range = 10;0–13;5), and 48 adults (60% = female, M_{age} = 20;7, range = 18;0–20;7). Parents reported their children's race and adults reported their own race (open-ended responses). An additional 20 participants were excluded for not selecting the expected response options in the training ($n = 3$) or posttest

phase ($n = 3$), or for selecting only curtain matches, only Black matches, or only White matches throughout the entire experimental phase ($n = 14$; in total: 10 at 4–6 years, 7 at 7–9 years, 1 at 10–13 years, 2 adults). Children were recruited in the Midwest at community centers, schools, and a university-affiliated museum. Adults were recruited from introductory psychology subject pools and fliers. An additional 55 adults participated in pretesting of the stimuli. Data collection took place from March 2013 to February 2014.

Materials

The images consisted of 24 parent faces and 17 girl faces. Adult images were drawn from the Radboud Faces Database (Langner et al., 2010), previous research (Kinzler & Dautel, 2012), and online. Girl faces were used for the focal stimuli to avoid potential gender-of-target effects (see Ho et al., 2011). Girl images were drawn from the Child Affective Facial Expression Set (LoBue & Thrasher, 2014) and are fully available at databrary.org. All images were forward facing with happy expressions. Images were pretested with 55 U.S. adults, who were shown a larger set of faces and asked, "What is the racial background of this person?" Response options included Black, White, Black and White, or Other. The selected girls images (i.e., 6 Black girls, 5 multiracial girls, 6 White girls) were categorized by the majority of participants as intended (either Black or White) at least 95% of the time. The selected girl images (i.e., 4 Black girls, 4 multiracial girls, 5 White girls) were categorized by the majority of participants as intended: Black ($M = 92\%$, range per image = 82%–100%), Black and White ($M = 65\%$, range per image = 56%–76%), or White ($M = 99\%$, range per image = 95%–100%). Repeated measures analyses of variance (ANOVAs) on the pretesting data confirmed the validity of these categorizations. Black girls were more likely to be categorized as Black than were multiracial or White girls, $F(2, 53) = 420.47$, $p < .001$, $\eta_p^2 = .89$; multiracial girls were more likely to be categorized as Black *and* White than were Black or White girls, $F(2, 53) = 121.67$, $p < .001$, $\eta_p^2 = .69$; and White girls were more likely to be categorized as White than were Black or multiracial girls, $F(2, 53) = 673.41$, $p < .001$, $\eta_p^2 = .93$.

Materials were presented on a computer using PowerPoint software. As described in the Procedure section below, each task consisted of three phases: training, experimental, and posttest. Each phase included three response options that were dis-

played at the top of the screen. In the training phase, response options were a cat, a red curtain, and a dog (for the first set of training trials), and a Dalmatian, a red curtain, and a Rottweiler (for the second set of training trials). In the experimental phase, the response options were a girl who was categorized as Black 100% of the time in the pretest, a red curtain, and a girl who was categorized as White 100% of the time in the pretest. Response options were always shown with the red curtain positioned in the middle, and the position of the response options in the experimental phase was counterbalanced across participants (i.e., Black girl, red curtain, White girl; White girl, red curtain, Black girl). For each participant, the order of the response options reversed after the first six experimental trials.

Targets were presented one at a time, centered at the bottom of the screen. In the experimental phase, targets were 12 girls who received the highest intended categorizations in the pretest other than the response options (i.e., 4 Black, 4 multiracial, 4 White) and were presented in random order with the constraint that the first three images were a Black girl, a multiracial girl, and a White girl (counterbalanced across participants).

Procedure

Participants were randomly assigned to the Parent-Absent task or the Parent-Present task and were tested individually by trained experimenters. The design of both tasks was adapted from previous research (Hirschfeld, 1995; Rhodes et al., 2014).

Parent-Absent Task. This task assessed participants' racial categorizations based on perceptual features alone.

Training phase. Participants saw a cat, a red curtain, and a dog, and were told,

> Here, I am going to show you pictures of animals. Your job is to tell me if each animal that I show you is the same kind as one of these three animals. The three animals are (*pointing to each*) a cat, a dog, and another animal hidden behind the red curtain. Look (*raising the curtain*), a pig is hidden behind the red curtain (*following this, the curtain would drop and hide the pig*). Now (*revealing a target pig*), where is the animal that is the same kind as this one (*pointing to the target pig*)?

After participants indicated that the animal that was the same kind as the target pig was hidden behind the curtain, they were told,

Good. From now on, you won't be able to see what is behind the red curtain, but if you think the one that is the same kind is behind it, point to it. Let's look at some more animals.

Participants were then asked to point to the one that was the same kind as a dog, a cat, and another pig. Next, participants were trained on three additional trials in which all images belonged to the same basic-level category (i.e., dogs). They were told that there were three dogs; one on the left (i.e., Dalmatian), one on the right (i.e., Rottweiler), and a never-seen dog behind a curtain. Participants then categorized a Dalmatian, Rottweiler, and Chihuahua (i.e., curtain match). These trials familiarized participants with the task and showed them that the full range of responses could be used even when all options were of the same basic-level category. Feedback was given when necessary and experimenters proceeded to the next phase only when participants completed the training phase successfully (see Figure S1 in the online Supporting Information).

Experimental phase. First, participants were shown the response options and told,

Now I am going to show you some pictures of girls. Your job is to tell me if each girl that I show you is the same kind as one of these three girls (*pointing to the response options*). The three girls are this girl (*pointing to the girl on the left*), this girl (*pointing to the girl on the right*), and another girl hidden behind the red curtain (*pointing to the red curtain in the middle*). Okay? Now (*revealing a target girl*), where is the girl that is the same kind as this one (*pointing to the target*)?

After participants responded, the target would fade out and another would fade in. Participants were then asked, "Where is the girl that is the same kind as this one (*pointing to the target*)?" Participants were asked the same question for the remaining trials.

Posttest. After the experimental phase, only the red curtain was displayed and participants were asked, "What can you tell me about the girl behind the red curtain?" If no response was given, participants were asked, "What do you think she looks like?" Participants were then shown a Black girl, a White girl, a multiracial girl, and a chicken, and were asked which image they believed was behind the red curtain all along. These questions were included for exploratory purposes and are not reported further. Finally, participants received three

animal control trials analogous to the training trials. For each, the response options were a rabbit, a red curtain, and a crocodile, and participants were asked to point to the appropriate response for a rabbit, a crocodile, and a penguin. The purpose of these trials was to ensure that participants still used the full range of responses after the experimental phase.

Parent-Present Task. The procedure was parallel to that of the Parent-Absent task; however, each target image was presented with two parents. Participants were asked to point to the parents and then point to the response option that was the same kind as the target. For instance, in the experimental phase, a target girl, a father, and a mother appeared and participants were told, "Look at this girl's dad and mom (*pointing to each*). Point to this girl's dad (*pointing to the target*). Point to this girl's mom (*pointing to the target*)." Next, both parents faded out until they were not visible and the display was identical to that in the Parent-Absent task. Participants were then asked, "Where is the girl that is the same kind as this one (*pointing to the target*)?" Participants followed this procedure for the remaining trials. Each target was randomly assigned one of two parent dyads (i.e., one father, one mother per set), counterbalanced across participants, with the constraint that Black targets had Black parents, White targets had White parents, and multiracial targets had one Black and one White parent. The race of the multiracial parent dyads was counterbalanced within participants (i.e., two had a Black mother and a White father; two had a White mother and a Black father).

Demographic Survey. Parents were emailed a follow-up survey adapted from previous research (O'Connor, Chavous, Jagers, Rowley, & Sellers, 2008; Pahlke, Bigler, & Suizzo, 2012), which assessed their child's intergroup contact and experiences with parental socialization. We asked parents about the racial/ethnic background of their child's friends and of the neighborhood where their child spent the majority of their time. Parents were asked to estimate the percentage of Asian, Black, Latino/Hispanic, White, and other people in these areas. Parental socialization was assessed by asking parents how often they discussed race with their child (e.g., How often do you identify and discuss people by race: $0 = never$, $1 = rarely$, $2 = sometimes$, $3 = often$, $4 = very often$; eight items, $\alpha = .87$). Adults self-reported this information after completing the task, and all questions pertained to when they were growing up (e.g., think about the neighborhood

where you grew up, how often did your parents speak to you about race when you were growing up; α = .83).

Results

Results are depicted graphically in the online supplementary materials. There were no effects of participant gender, parent set, or race of the multiracial parent dyads (i.e., which parent was which race for the multiracial targets), so the data were collapsed over these variables. All comparisons that are discussed are significant at $p < .05$ except when noted. To test our predictions that participants would make more expected categorizations for monoracial targets than for multiracial targets, and that older children and adults would make more expected categorizations for multiracial targets in the Parent-Present task, we calculated how often participants matched Black targets with the Black response option, White targets with the White response option, and multiracial targets with the curtain (henceforth referred to as "expected categorizations"). We then conducted a 3 (target race: Black, White, multiracial) × 2 (task: Parent-Absent, Parent-Present) × 4 (age group: 4–6, 7–9, 10–13, adults) repeated measures ANOVA with target race as a within-subjects factor and the expected categorizations for Black, White, and multiracial targets as the dependent variables. There was a significant main effect of target race, $F(2, 368) = 44.08$, $p < .001$, $\eta_p^2 = .19$. Participants made more expected categorizations for Black targets ($M = 3.35$, $SD = 1.05$) than White targets ($M = 2.93$, $SD = 1.34$), which were both higher than the expected categorizations for multiracial targets ($M = 2.30$, $SD = 1.47$). There was also a main effect of task, $F(1, 184) = 16.66$, $p < .001$, $\eta_p^2 = .08$. Participants made more expected categorizations in the Parent-Present task ($M = 3.07$, $SD = 1.26$) than in the Parent-Absent task ($M = 2.64$, $SD = 1.27$). Furthermore, there was also a main effect of age group, $F(3, 184) = 27.11$, $p < .001$, $\eta_p^2 = .31$, indicating more expected categorizations with age. Each pair of means differed significantly, with the exception of the comparison between 10- to 13-year-olds and adults, which was not significant.

More focally, there was a significant interaction of target race and task, $F(2, 368) = 3.49$, $p = .03$, $\eta_p^2 = .02$; target race and age group, $F(6, 368) = 2.82$, $p = .01$, $\eta_p^2 = .04$; and task and age group, $F(3, 184) = 2.98$, $p = .03$, $\eta_p^2 = .05$; and a significant three-way interaction of target race, task, and age group, $F(6, 368) = 2.90$, $p = .01$, $\eta_p^2 = .05$.

Given our interest in multiracial targets, subsequent comparisons focused on multiracial targets (yet additional comparisons and descriptive statistics are presented in Table 1). Curtain matches were higher in the Parent-Present task ($M = 2.65$, $SD = 1.52$) than in the Parent-Absent task ($M = 1.96$, $SD = 1.33$). However, this difference was significant only for 10- to 13-year-olds and adults. In the Parent-Present task, the two oldest age groups made more curtain matches than the two youngest age groups. These data reveal that when multiracial targets were presented with parentage information, older children and adults were more likely to think of them as neither Black nor White. In the Parent-Absent task, rates of curtain matches did not differ across age groups. One-sample t tests indicated that curtain matches for 4- to 6-year-olds in the Parent-Absent task and in the Parent-Present task, and for adults in the Parent-Absent task, were not significantly higher than chance (i.e., 1.33). All other age groups made curtain matches at above chance levels.

Biases in Categorizing Multiracial Targets

To test our predictions that adults would categorize multiracial targets as more Black than White in both tasks (as a result of ideological motives to endorse hypodescent), and that children would only do so in the Parent-Absent task (as a result of a perceptual bias), we calculated participants' bias scores as the frequency of categorizing multiracial targets as White subtracted from the frequency of categorizing multiracial targets as Black. Positive scores indicated a bias toward categorizing multiracial targets as Black relative to White, and negative scores indicated a bias toward categorizing multiracial targets as White relative to Black. Scores of zero indicated no bias. We conducted a 2 (task: Parent-Absent, Parent-Present) × 4 (age group: 4–6, 7–9, 10–13, adults) ANOVA with the bias score as the dependent variable. There was a main effect of task, $F(1, 184) = 24.39$, $p < .001$, $\eta_p^2 = .12$. Participants had a higher Black-categorization bias in the Parent-Absent task ($M = 1.39$, $SD = 1.68$) than in the Parent-Present task ($M = .31$, $SD = 1.39$), thereby reflecting a perceptual bias. There was also a main effect of age group, $F(3, 184) = 3.07$, $p = .03$, $\eta_p^2 = .05$. Adults ($M = 1.35$, $SD = 1.52$) had a higher Black-categorization score than 10- to 13-year-olds ($M = .41$, $SD = 1.36$). One-sample t tests revealed that in the Parent-Absent task, all age groups were significantly above zero, thereby revealing a Black-categorization bias across all age groups. In the

Table 1
Means and Standard Deviations of Expected Categorizations

Study	Task	Age group	Target race M (SD) Black	White	Multiracial
1	Parent-Absent	4–6	**2.63 (1.25)**$_{a,1}$	1.79 (1.29)$_{b,1}$	1.71 (1.27)$_{b,1}$
		7–9	**3.33 (0.92)**$_{a,1,2}$	2.50 (1.29)$_{b,1}$	2.13 (1.26)$_{b,1}$
		10–13	**3.29 (1.23)**$_{a,1,2}$	2.67 (1.37)$_{b,1}$	2.25 (1.36)$_{b,1}$
		Adult	**3.96 (0.20)**$_{a,2}$	3.75 (0.85)$_{a,2}$	1.75 (1.42)$_{b,1}$
	Parent-Present	4–6	**2.92 (1.21)**$_{a,1}$	2.71 (1.23)$_{a,1}$	1.50 (1.53)$_{b,1}$
		7–9	**3.00 (1.18)**$_{a,1,2}$	2.58 (1.61)$_{a,1}$	2.29 (1.40)$_{a,1,2}$
		10–13	**3.71 (0.69)**$_{a,2,3}$	3.46 (1.02)$_{a,1,2}$	3.50 (0.98)$_{a,3}$
		Adult	**4.00 (0.00)**$_{a,3}$	3.75 (0.85)$_{a,2}$	3.29 (1.27)$_{a,2,3}$
2	Parent-Absent	4–6	**3.08 (0.97)**$_{a,1,2}$	2.88 (1.26)$_{a,1}$	1.21 (1.29)$_{b,1}$
		7–9	2.67 (1.33)$_{a,b,1}$	3.04 (1.17)$_{a,1}$	2.00 (1.61)$_{b,1,2}$
		10–13	**3.38 (1.25)**$_{a,1,2}$	3.42 (0.97)$_{a,1,2}$	2.46 (1.47)$_{b,2}$
		Adult	**3.75 (1.13)**$_{a,2}$	3.96 (0.20)$_{a,2}$	2.17 (1.71)$_{b,1,2}$
	Parent-Present	4–6	2.32 (1.18)$_{a,1}$	2.44 (1.45)$_{a,1}$	1.48 (1.33)$_{b,1}$
		7–9	**3.28 (1.06)**$_{a,2}$	3.20 (1.23)$_{a,1,2}$	2.68 (1.15)$_{a,2}$
		10–13	2.96 (1.30)$_{a,1,2}$	3.04 (1.30)$_{a,1,2}$	3.50 (0.66)$_{a,2}$
		Adult	**3.71 (0.91)**$_{a,2}$	3.71 (0.91)$_{a,2}$	3.29 (1.27)$_{a,2}$

Note. Subscript letters indicate comparisons within task and age group across target types (compare horizontally); same letters indicate values that do not significantly differ from one another at $p < .05$. Subscript numerals indicate comparisons within task and target type across age groups (compare vertically); same numerals indicate values that do not significantly differ from one another at $p < .05$. Bolded values are significantly different from chance (1.33) according to one-sample t tests.

Table 2
Means and Standard Deviations of Bias Scores

Study	Task	4–6 M (SD)	7–9 M (SD)	10–13 M (SD)	Adults M (SD)
1	Parent-Absent	**1.21 (1.81)**	**1.37 (1.55)**	0.83 (1.76)	**2.17 (1.37)**
	Parent-Present	0.41 (1.66)	0.29 (1.78)	0.00 (0.58)	**0.54 (1.21)**
2	Parent-Absent	−0.46 (1.81)	0.24 (1.79)	0.38 (1.56)	**1.83 (1.71)**
	Parent-Present	**−1.42 (1.31)**	−0.28 (1.02)	0.00 (0.72)	**0.50 (1.06)**

Note. Positive scores indicate a bias toward categorizing multiracial targets as Black and negative scores indicate a bias toward categorizing multiracial targets as White. Bolded values are significantly different from chance (i.e., 0) according to one-sample t tests.

Parent-Present task, only adults' bias score was significantly above zero, thereby revealing hypodescent only among adults (see Table 2).

Demographic Survey

Group Contact. All adult participants completed the follow-up survey (which was administered immediately after the curtain task); however, only 38% of parents did (which was administered as a follow-up e-mail). Given the low return rate, survey data were collapsed across the child age groups (in total: 16 at 4–6 years, 14 at 7–9 years, 19 at 10–13 years). We created an index of group contact by summing and averaging the percentage of White friends and White neighborhood residents (White, in-group contact), as well as the percentage of Black friends and Black neighborhood residents (Black, out-group contact; each could range from 0% to 100%). We then conducted a 2 (participant race: White, Black) × 2 (age group: children, adults) multivariate ANOVA with indices for in-group and out-group contact as the dependent variables. This analysis revealed that children and adults had comparable rates of in-group contact ($M = 74.72\%$, $SD = 23.46$ and $M = 80.23\%$, $SD = 13.67$, respectively, ns), but that children ($M = 11.81\%$, $SD = 14.86$) had higher levels of out-group contact

than adults (M = 6.61%, SD = 7.93), $F(1, 100)$ = 4.96, p = .028, η_p^2 = .05.

To test our prediction that group contact would predict participants' categorizations, we conducted regression analyses with in-group contact (i.e., contact with other White people) and out-group contact (i.e., contact with Black people) as the predictor variables and the bias score as the dependent variable. Consistent with research showing that White perceivers are perceptually biased to categorize ambiguous faces in accordance with the less familiar features in their environment (Halberstadt et al., 2011), we found that children's increased in-group contact (i.e., with other Whites) predicted the tendency to categorize multiracial targets as Black relative to White, R^2 = .08, B = .02, $SE\ B$ = .01, t = 2.19, p = .033. Similarly, adults' rates of White-group contact were marginally predictive of their tendency to categorize multiracial targets as Black relative to White, R^2 = .06, B = .03, $SE\ B$ = .02, t = 1.74, p = .061.

Parental Socialization. Parents reported speaking to their children about race-related issues sometimes (M = 2.64 on a scale of 0–4, SD = 0.66), and adults reported that their parents spoke to them about race often (M = 3.18, SD = 0.53), significantly different at p < .001. Parental socialization data did not predict participants' categorizations, for children or adults.

Discussion

Overall, White U.S. children and adults made more expected categorizations for Black and White targets than for multiracial targets. This finding extends research showing that for adults, categorizations of multiracial individuals are relatively more challenging than those of monoracial individuals (Chen & Hamilton, 2012), and demonstrates that this challenge is also present during childhood. However, both children and adults were sensitive to parentage information in directing their categorizations. Learning that a multiracial individual had both a Black and a White parent promoted the classification of that individual as not wholly Black or wholly White, as seen in the finding that for older children and adults, multiracial–curtain matches were more likely in the Parent-Present condition than the Parent-Absent condition. This finding supports work showing that by age 10, children reason that a person with Black and White parentage was not wholly Black or wholly White (Hirschfeld, 1995). In contrast, for younger children, inclusion of parentage information did not affect rates of expected categorizations.

Across all age groups, multiracial targets were more likely to be categorized as Black than as White in the absence of parentage information. This finding aligns with Dunham et al. (2013), suggesting that White children raised in predominantly White contexts are biased toward categorizing ambiguous targets as minority. Indeed, in-group contact was associated with a greater tendency to categorize multiracial targets as Black relative to White. These findings are consistent with previous research (Halberstadt et al., 2011), suggesting that White perceivers with lower rates of out-group contact overweigh out-group features when ambiguous targets are presented ambiguously, thereby resulting in the tendency to categorize multiracial individuals as Black relative to White. In contrast, when parentage information was provided, adults —but not children—were more likely to categorize multiracial targets as Black than as White, which suggests that adults, as a result of ideological motives, were additionally susceptible to hypodescent in which they treated multiracial targets as categorically more Black than White despite their Black *and* White heritage. The finding that children's categorization biases disappeared in the Parent-Present task suggests that they used parentage information to disambiguate multiracial targets.

Study 2

The results of Study 1 raise the question of whether and to what extent we might find different patterns with Black participants, who have different in- versus out-groups as well as different socialization experiences. We therefore conducted a second study with U.S. Black participants, for which we had several predictions. First, we predicted that all age groups would make more expected categorizations for Black and White targets than for multiracial targets, which would extend previous work (including our own Study 1) by showing that also within Black samples, categorizations of multiracial individuals are relatively more challenging than those of monoracial targets. Second, we predicted that older children and adults would categorize multiracial targets with the curtain more often in the Parent-Present task than in the Parent-Absent task, showing that parentage information promotes the reasoning that multiracial targets are not wholly Black or wholly White. Third, because Black children often reason about race at an earlier age than White children (Kinzler & Dautel, 2012), we predicted that Black children may reason that multira-

cial targets are not wholly Black or wholly White at an earlier age than in Study 1 (i.e., 10–13 years). Fourth, we predicted that Black children, by virtue of having more opportunities to learn about both minority and majority group features (Anzures et al., 2013) and having fewer intergroup biases (Newheiser & Olson, 2012), would not show a perceptual bias to categorize multiracial targets as differentially Black or White. Fifth, we predicted that Black adults, likely as a result of political ideology (Davis, 1991), would categorize multiracial targets as Black more often than as White in both tasks. We made no predictions as to when in development this would emerge. Sixth, we predicted that intergroup contact would predict categorizations of multiracial targets.

Method

Participants

Black U.S. participants of four age groups were included ($N = 195$): forty-nine 4- to 6-year-olds (54% = female, $M_{age} = 5;2$, range = 4;0–6;10), fifty 7- to 9-year-olds (36% = female, $M_{age} = 8;4$, range = 7;0–9;9), forty-eight 10- to 13-year-olds (48% = female, $M_{age} = 11;5$, range = 10;0–13;8), and 48 adults (56% = female, $M_{age} = 20;4$, range = 18;1–26;4). Parents reported their children's race and adults reported their own race (open-ended responses). An additional 26 participants were excluded for not selecting the expected response options in the training ($n = 3$) or posttest phase ($n = 3$), or for selecting the same response option throughout the entire experimental phase ($n = 20$; in total: 13 at 4–6 years, 12 at 7–9 years, 1 at 10–13 years). Participants were recruited from the same sources as those in Study 1.

Materials and Procedure

The materials and procedure were identical to those in Study 1.

Results

Results are depicted graphically in the online supplementary materials. There were no effects of participant gender, parent set, or race of the multiracial parent dyads, so data were collapsed over these variables. Discussed comparisons are significant at $p < .05$ except when noted. Again, we first tested our predictions that participants would make more expected categorizations for monoracial targets than for multiracial targets, and that older children and adults would make more expected categorizations for multiracial targets in the Parent-Present task, by calculating the expected categorizations for each target type, and then by conducting a 3 (target race: Black, White, multiracial) × 2 (task: Parent-Absent, Parent-Present) × 4 (age group: 4–6, 7–9, 10–13, adults) repeated measures ANOVA with target race as a within-subjects factor and the number of expected categorizations for Black, White, and multiracial targets as the dependent variables. A significant main effect of target race, $F(2, 374) = 37.85$, $p < .001$, $\eta_p^2 = .17$, showed that participants made more expected categorizations for Black targets ($M = 3.14$, $SD = 1.17$) and White targets ($M = 3.21$, $SD = 1.19$) than multiracial targets ($M = 2.35$, $SD = 1.52$). Expected categorization rates for Black and White targets did not differ significantly ($p = 1.00$). There was also a main effect of age group, $F(3, 187) = 20.07$, $p < .001$, $\eta_p^2 = .24$, indicating greater rates of expected categorizations with age.

There were significant interactions involving target race and task, $F(2, 374) = 13.04$, $p < .001$, $\eta_p^2 = .07$, and target race and age group, $F(6, 374) = 2.99$, $p = .007$, $\eta_p^2 = .05$. Because we were primarily interested in multiracial targets, subsequent comparisons focused on their categorizations. Participants made more curtain matches in the Parent-Present task ($M = 2.74$, $SD = 1.36$) than in the Parent-Absent task ($M = 1.96$, $SD = 1.57$). Pairwise comparisons showed that this difference was significant only for 10- to 13-year-olds and adults, and marginally significant for 7- to 9-year-olds ($p = .08$). In the Parent-Present task, 7- to 9-year-olds, 10- to 13-year-olds, and adults made more curtain matches than 4- to 6-year-olds, suggesting that they used parentage information to disambiguate multiracial targets. In the Parent-Absent task, 10- to 13-year-olds made more curtain matches than 4- to 6-year-olds. One-sample t tests indicated that 4- to 6-year-olds in the Parent-Absent and Parent-Present tasks made curtain matches at chance levels. All other age groups made curtain matches at above-chance levels (see Table 1).

Biases in Categorizing Multiracial Targets

To test our prediction that adults would categorize multiracial targets as more Black than White in both tasks (reflecting ideological motives to endorse hypodescent), and that children would not be biased in either task (reflecting the absence of either perceptual biases or ideological motives), we examined

participants' categorization biases through a 2 (task: Parent-Absent, Parent-Present) × 4 (age: 4–6, 7–9, 10–13, adults) ANOVA, using bias scores as the dependent variable. This yielded a main effect of task, $F(1, 186) = 15.13$, $p < .001$, $\eta_p^2 = .08$. Participants displayed more of a Black-categorization bias in the Parent-Absent task ($M = .50$, $SD = 1.88$) than in the Parent-Present task ($M = -.30$, $SD = 1.25$). We also found a main effect of age group, $F(3, 186) = 17.59$, $p < .001$, $\eta_p^2 = .22$, indicating that 4- to 6-year-olds ($M = -.94$, $SD = 1.64$) showed more of a White-categorization bias than each of the three older age groups, and that adults ($M = 1.17$, $SD = 1.56$) showed more of a Black-categorization bias than each of the three younger age groups. One-sample t tests revealed that in the Parent-Absent task, only adults' bias scores were significantly above zero. In the Parent-Present task, 4- to 6-year-olds' bias scores were significantly below zero, and adults' bias scores were significantly above zero (reflecting hypodescent; see Table 2).

Demographic Survey

Group Contact. All adult participants completed the follow-up survey but only 37% of parents returned the survey. We therefore collapsed the survey data across the three child age groups (in total: 12 at 4–6 years, 18 at 7–9 years, 22 at 10–13 years). Paralleling Study 1, we ran a 2 (participant race: White, Black) × 2 (age group: children, adults) multivariate ANOVA with indices of in-group (i.e., Black) and out-group (i.e., White) contact as the dependent variables. This analysis revealed that children ($M = 32.92\%$, $SD = 21.08$) had more out-group contact than adults ($M = 23.63\%$, $SD = 22.40$), $F(1, 97) = 4.51$, $p = .036$, $\eta_p^2 = .04$, and that children ($M = 50.77\%$, $SD = 23.86$) had less in-group contact than adults ($M = 64.59\%$, $SD = 26.24$), $F(1, 97) = 7.54$, $p = .007$, $\eta_p^2 = .07$. To test our prediction that group contact predicted participants' responses, we ran regression analyses with in-group contact (i.e., contact with other Black people) and out-group contact (i.e., contact with White people) as the predictor variables and the bias score as the dependent variable. These analyses revealed that increased in-group contact was predictive of categorizing multiracial targets as Black relative to White, $R^2 = .14$, $B = .03$, SE $B = .01$, $t = 2.89$, $p = .005$, whereas increased out-group contact was predictive of categorizing multiracial targets as White relative to Black, $R^2 = .08$, $B = -.02$, SE $B = .01$, $t = -2.04$, $p = .047$. Group contact did not significantly predict adults' categorizations.

Parental Socialization. On average, parents reported talking to their children about race-related issues sometimes ($M = 2.77$, $SD = 0.85$). Adults reported that their parents spoke to them about race often ($M = 3.43$, $SD = 0.73$), significantly different at $p < .001$. Parental socialization was not significantly predictive of children's or adults' responses.

Cross-Study Comparison

We combined the data from both studies and conducted a 2 (participant race: White, Black) × 2 (task: Parent-Absent, Parent-Present) × 4 (age group: 4–6, 7–9, 10–13, adults) ANOVA with target race as a within-subjects factor and the number of expected categorizations for multiracial targets as the dependent variables. There were no significant main effects or interactions involving participant race, suggesting that expected categorizations of multiracial targets did not differ across studies. We then conducted a 2 (participant race: White, Black) × 2 (task: Parent-Absent, Parent-Present) × 4 (age: 4–6, 7–9, 10–13, adults) ANOVA with bias scores as the dependent variable. This analysis yielded a main effect of participant race, $F(1, 371) = 25.32$, $p < .001$, $\eta_p^2 = .06$, indicating that White participants showed more of a Black-categorization bias for multiracial targets ($M = 0.85$, $SD = 1.63$) than Black participants ($M = 0.47$, $SD = 1.67$). This effect was qualified further by a significant interaction of participant race and age group, $F(3, 371) = 5.88$, $p = .001$, $\eta_p^2 = .05$, revealing that this difference was significant within the two younger groups only (4- to 6-year-olds and 7- to 9-year-olds). That is, 4- to 9-year-old White children were more likely to categorize multiracial targets as Black relative to White than were same-age Black children. Next, we conducted a 2 (participant race: White, Black) × 2 (age group: children, adults) multivariate ANOVA with rates of White contact and Black contact as the dependent variables. We found main effects of participant race on White contact, $F(1, 197) = 258.651$, $p < .001$, $\eta_p^2 = .59$, and Black contact, $F(1, 197) = 304.96$, $p < .001$, $\eta_p^2 = .61$, showing that White participants ($M = 77.48\%$, $SD = 19.68$) had more White contact than Black participants ($M = 28.23\%$, $SD = 22.10$), and that Black participants ($M = 57.68\%$, $SD = 25.84$) had more Black group contact than White participants ($M = 9.31\%$, $SD = 12.45$).

Discussion

Black U.S. children and adults made more expected categorizations for Black and White targets

than for multiracial targets, which extends research with predominantly non-Black samples by suggesting that in comparison to categorizations of monoracial targets, categorizations of multiracial targets are also challenging within Black samples. For multiracial targets, the two oldest age groups (and to a marginal extent, 7- to 9-year-olds) made more curtain matches in the Parent-Present task than in the Parent-Absent task, suggesting that parentage information reduced multiracial target ambiguity. Thus, for Black children, reasoning that individuals with one Black and one White parent were not wholly Black or wholly White was present at 10–13 (consistent with Hirschfeld, 1995) and may even be present around 7–9. Notably, study comparisons revealed that curtain matches did not differ across studies, suggesting that this reasoning developed similarly across samples.

Black adults categorized multiracial targets as Black relative to White both in the absence and in the presence of parentage information, thereby replicating the data from our White sample, and suggesting that Black adults may be ideologically motivated to categorize multiracial individuals as Black (Davis, 1991). Black children, on the other hand, were not biased toward categorizing multiracial targets as more Black than White, or vice versa, in the absence of parentage information. This finding aligns with research indicating that racial minority children are less likely than White children to develop perceptual categorization biases toward ambiguous targets or intergroup biases, likely as a result of greater in-group and out-group contact (Bar-haim et al., 2006). This interpretation was corroborated further by the demographics survey, which indicated that on average, Black participants had more frequent out-group contact than White participants.

Interestingly, the survey data indicated that for Black participants, increased in-group contact predicted a greater tendency to categorize multiracial targets as Black relative to White, and increased out-group contact predicted a greater tendency to categorize multiracial targets as White relative to Black. These data suggest that group contact influences Black children's categorizations, as was found in Study 1, though the patterns are different for Black than White children (see General Discussion).

Unexpectedly, in the presence of parentage information, Black 4- to 6-year-olds were biased toward categorizing multiracial targets as White relative to Black. Ostensibly, this finding provides evidence for hyperdescent and could be interpreted as consistent with Halberstadt et al. (2011). That is, in order to learn about out-group features, Black 4- to 6-year-olds may have overweighed the White category. However, because Black 4- to 6-year-olds did not show this bias in the absence of parentage information, and because increased out-group contact was predictive of a *greater* tendency to categorize multiracial targets as White relative to Black, we are hesitant to make this conclusion and encourage additional work to replicate this finding.

General Discussion

In two studies, we explored how U.S. children and adults, both White (Study 1) and Black (Study 2), categorized multiracial individuals (e.g., as Black *or* White) in the absence and in the presence of parentage information. Around age 10, children categorized individuals with Black and White parentage as not wholly Black or wholly White. We also found evidence for both a perceptual bias and hypodescent, though responses varied by age and race. Overall, participants made more expected categorizations for monoracial targets than for multiracial targets, and then focusing on multiracial targets, made more expected categorizations in the presence of parentage information than in the absence of it. These data are consistent with the adult literature, showing that children's categorizations of multiracial individuals are relatively more challenging than categorizations of monoracial individuals, and also that White and Black children and adults use parentage information to guide their judgments. Below, we discuss the categorization of multiracial targets by adults and by children.

U.S. Adults' Categorizations of Multiracial Individuals

Research with predominantly non-Black adults showed that when given information that made a multiracial category salient (e.g., racial labels), as well as time to make deliberate responses, they most often categorized multiracial individuals as multiracial (Chen & Hamilton, 2012; Peery & Bodenhausen, 2008). The present data supported that research and demonstrated that both White and Black adults reasoned that multiracial individuals were not wholly Black or wholly White. However, other work showed that when adults did not categorize multiracial individuals as multiracial, they categorized them as Black more often than as White (e.g., Ho et al., 2013; Krosch & Amodio, 2014; Skinner & Nicolas, 2015). Consistent with this result, we found that regardless of whether

multiracial targets were presented with or without parentage information, White and Black adults were biased toward categorizing them as Black more often than White (i.e., endorsed hypodescent). That is, even when it was clear that multiracial targets had one Black and one White parent, White *and* Black adults categorized them as Black more often than White. For White adults, such categorizations may reflect a tendency to overweigh minority features, as well the ideology to reinforce group boundaries between themselves and racial minorities (e.g., Ho et al., 2013). For Black adults, such categorizations may reflect the ideology to include multiracial individuals in the in-group as a means to increase the political strength and membership of the Black community (e.g., Davis, 1991). Thus, although both White and Black adults categorized multiracial targets as Black more often than as White, different ideological motives may have influenced their reasoning. Further evidence for these differential motives is that White adults categorized multiracial targets in accordance with their out-group more often than with their in-group (in-group exclusion), whereas Black adults categorized multiracial targets in accordance with their in-group more often than with their out-group (in-group inclusion). Such ideological motives have been empirically detected with White samples (e.g., Chao et al., 2013; Ho et al., 2013; Krosch et al., 2013), but untested and only predicted with Black samples (Davis, 1991; Morning, 2005), so we look forward to additional empirical work that explores these ideologies with additional non-White samples.

Alternatively, hypodescent could be a historically situated and learned pattern of categorization in the United States that White and Black Americans endorse by adulthood. It is also possible that adults, both White and Black, with a history of personal interactions with multiracial individuals who self-identify as Black expect other multiracial individuals to be categorically Black. Certainly, future research is needed to more fully understand adults' categorizations. One further possibility that deserves examination is that the testing context played a role. That is, both Black and White adults were recruited at a majority White university and therefore lived in a majority White setting, which may have influenced them to categorize multiracial individuals as Black (in accordance with the immediate minority).

Adults most often categorized multiracial targets as being not wholly Black or wholly White, but still they were not without bias. Indeed, 29.5% of adults in our sample (31% of White adults, 28% of Black

adults) evidenced hypodescent, and importantly, these percentages were likely underestimations of its prevalence nationally. Our adult sample was drawn from a university with a relatively liberal student body, and adults with more traditional and conservative ideologies show higher rates of hypodescent (Ho et al., 2013; Krosch et al., 2013). Additionally, the multiracial targets used in this study consisted of female faces with happy expressions, but male targets with angry expressions may be more subject to hypodescent (Dunham et al., 2013; Ho et al., 2011). We therefore encourage additional work that explores the ideological underpinnings of hypodescent with more diverse stimuli.

U.S. Children's Categorizations of Multiracial Individuals

By 10–13 years of age, both White and Black children typically reasoned that multiracial individuals were not wholly Black or wholly White. Younger Black children (7–9 years) also did so, which is consistent with research showing that racial minority children reason about race sooner than White children (Kinzler & Dautel, 2012). Regardless, these data show that by early adolescence, U.S. children showed an adult-like pattern of categorizing multiracial individuals as neither Black nor White. Nevertheless, like adults, children displayed some biases in their categorizations. In the absence of parentage information, White children of all age groups, but not Black children, were biased toward categorizing multiracial targets as Black, which aligns with previous research suggesting that White children, by virtue of being a majority, were susceptible to a perceptual bias in which they overweighed minority features when categorizing ambiguous targets (Bar-haim et al., 2006), and also that they are more likely than Black children to show intergroup biases (Newheiser & Olson, 2012). We expected children's perceptual bias to increase at each age group, but found that their rates were equivalent across child age groups. Perhaps skin color provided sufficient perceptual cue for this bias, and thus other physical features were considered less informative for this judgment. More research that examines the specific physical features children attend to when categorizing multiracial individuals could yield further insights.

Neither Black nor White children showed evidence for hypodescent: up to age 13. With the exception of Black 4- to 6-year-olds, they were equally likely to categorize multiracial targets as Black and as White when it was clear that they had

both one Black and one White parent. Additional work is needed to examine when in development the ideological motive to endorse hypodescent emerges. Quintana (1998) suggests that at approximately 10–14 years of age, children reason about racial categories from broader and more socially grounded practices. For children growing up in the United States, the practice that a person with any trace of Black heritage is categorically Black and not White may be among them.

Among the most notable findings were those involving direct group contact (i.e., friendships, neighborhood residents). For White children, increased in-group contact (with White people) predicted the categorizations of multiracial individuals as Black relative to White. Consistent with Halberstadt et al. (2011), these data demonstrate that White children living in predominantly White contexts tend to overweigh less frequent minority features and subsequently categorize multiracial targets as Black. For Black children, increased in-group contact (with Black people) predicted the categorizations of multiracial individuals as Black relative to White, whereas increased out-group contact predicted the categorizations of multiracial individuals as White relative to Black. Therefore, Black children tended to categorize multiracial targets more in accordance with whichever group they had the most contact with. Notably, rates of in-group contact played less of a predictive role for adults, suggesting that by adulthood, ideological motives transcend contexts to influence these categorizations.

Comparing across studies, it seems as if increased in-group contact for White children is associated with *excluding* multiracial individuals from the in-group, whereas for Black children it is associated with *including* multiracial individuals in the in-group. Thus, although group contact influences children's categorizations (Hirschfeld, 1995), it operates differently across social groups. One possibility is that children with less out-group contact identify more strongly with their in-group. As a result of this stronger identification, White children may be motivated to exclude multiracial individuals from the in-group, whereas Black children may be motivated to include multiracial individuals in their in-group (which would parallel adult motivations). Kinzler and Dautel (2012) found that White and Black children living in the same region reasoned about the stability of race differently. They speculated that parental socialization practices played a role, though our data showed no relations between parental socialization and categorizations.

Certainly, given the low return rates for the survey data, they should be interpreted with caution, and we look forward to research that explores the complex interplay between group membership, group contact, and social experiences on children's reasoning about race.

Methodological and Interpretive Considerations

One potential concern is that perhaps participants were reluctant to select the curtain as a result of not knowing what was behind it. This reluctance would have decreased participants' rates of expected categorizations for multiracial targets but not for monoracial targets, thereby ostensibly showing that categorizations of multiracial targets were relatively more challenging. Although possible, we argue that target ambiguity, not curtain ambiguity, motivated participant responses. First, all participants used the curtain appropriately in the training phase and posttest even when not knowing what was behind it (e.g., when shown a rabbit, a curtain, and a crocodile, participants judged that the same kind of animal as a penguin was behind the curtain, even though they were never shown that a penguin was behind the curtain). Second, the two oldest age groups used parentage information to select the curtain more frequently and did not need to know what was behind the curtain in order to do so. Had they been influenced by curtain ambiguity and not target ambiguity, their responses should have not differed as a function of parentage information. Third, participants were mostly biased toward categorizing multiracial targets as Black (but not White). Had participants been influenced only by curtain ambiguity, they should have selected the Black and White response options at comparable rates.

Although these data are highly informative about the categorization of multiracial *individuals*, we caution that this is distinct from measuring participants' use of "multiracial" as a *category*. Because we do not know what content the curtain had for participants (e.g., it could have been interpreted as representing another monoracial or monoethnic category, such as Asian, Latina, or Indian, or could even have just been an undifferentiated "other"), we only know that selection of the curtain indicates a judgment that the target was *not wholly Black or wholly White*. In order to assess children's understanding of multiracial categories, other methods are needed.

One puzzle is the curious pattern of White 4- to 6-year-olds on the Parent-Absent task. This group

was at-chance both on the multiracial–curtain matches and the White target–White response option matches. One possibility is that White 4- to 6-year-olds had difficulty with the demands of the task. However, all children selected the appropriate options (visible pictures or curtain) during the training and posttest phases, thus arguing against this interpretation. We suggest instead that White 4- to 6-year-olds struggled with race-based human categorizations specifically. There is growing evidence that White children in this age range do not conceptualize race as a salient category and therefore often do not use it as a basis for inferences (Kinzler & Dautel, 2012; Rhodes et al., 2014). That is, children can detect racial differences and can use them when directly prompted to do so, but may consider them to be relatively unimportant. Certainly, exploring White preschoolers' categorizations further would shed insight into their use of race when making human categorizations.

Future Directions and Broader Implications

Our data show variation in categorizations of multiracial individuals as a function of age, group membership, parentage information, and rates of group contact. More work is needed to understand why and how these factors affect concepts of race. It would also be useful to examine these issues in contexts with different racial categorization systems (e.g., Brazil, South Africa), with multiracial individuals with other racial backgrounds (e.g., Asian/White), and with multiracial participants themselves. This study also opens up new questions regarding children's concepts of race. Categories vary in structure—from arbitrary artifact categories with graded category membership, to deeply informative natural kinds with discrete boundaries (Rhodes et al., 2014). Although racial categories are not natural kinds, they are often treated as such by children (Gaither et al., 2014) and adults (Haslam, Rothschild, & Ernst, 2000). Exploring the categorizations of multiracial individuals provides insights into the extent to which racial categories are treated as overlapping versus discrete.

Finally, this work has implications for social development. The number of Americans who identify with multiple racial categories make up a burgeoning demographic. Thus, understanding how people come to perceive and categorize multiracial individuals has important implications for understanding U.S. society. Although the U.S. Census now permits people to identify with multiple racial categories, self-identified multiracial Americans often report being categorized by others in ways that are inconsistent with how they self-identify. Several studies indicate that these (mis)categorizations, also referred to as instances as "identity invalidation" (see Rockquemore & Brunsma, 2008), are associated with decreased self-esteem, motivation, ability to form quality social relationships, and increased depression (e.g., Townsend, Markus, & Bergsieker, 2009). For these reasons, self-identified multiracial individuals appreciate when others see them as multiracial, rather than as Black or White (Remedios & Chasteen, 2013).

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Figure S1. Example Trial from training Phase (Parent-Absent task)

Figure S2. Study 1. Mean Frequencies (out of 4) for Multiracial-Curtain Matches Across Age Group and Task. Bars Depict Standard Error

Figure S3. Study 2. Mean Frequency (out of 4) for Multiracial Curtain Matches Across Age Group and Task. Bars Depict Standard Error

Figure S4. Study 1. Mean Frequencies (out of 4) for all Categorizations Across Age Group and Task. Bars Depict Standard Error

Figure S5. Study 2. Mean Frequency (out of 4) for all Categorizations Across Age Group and Task. Bars Depict Standard Error