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Black + White = Not White: A minority bias in categorizations of Black-White multiracials

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ABSTRACT

The present research sought to provide new insights on the principles guiding the categorization of Black-White multiracial faces at a first encounter. Previous studies have typically measured categorization of multiracial faces using close-ended tasks that constrain available categorizations. Those studies find evidence that perceivers tend to categorize multiracials as Black more often than as White. Two studies used less constrained, implicit (Experiment 1) and explicit categorization (Experiment 2) tasks and found that multiracial faces were most frequently categorized into racial minority groups but not necessarily as Black. These studies suggested a *minority bias* in multiracial categorizations, whereby multiracials are more frequently categorized as non-White than as White. Experiment 3 provided additional support for the minority bias, showing that participants categorized multiracials as "Not White" more often than as any other category. Participants were also faster to exclude multiracial faces from the White category than from any other racial category. Together, these findings are the first to document the minority bias as a guiding principle in multiracial categorization.

Multiracialism is on the rise in the United States. It is projected that one in five Americans will identify as multiracial by 2050 (Farley, 2001). Paralleling this demographic shift, research on the perception of multiracial individuals has recently increased in social psychology. To date, much of this research has focused on the question: how are multiracial individuals racially categorized?

The question of how perceivers racially categorize multiracial individuals is important because social categorization processes powerfully impact downstream social perception and social interaction. For example, perceiving multiracial people to be Black can lead to a host of intergroup consequences, including out-group homogeneity (Chen & Ratliff, 2015) and discrimination (Gaither, Babbitt, & Sommers, 2018; Krosch & Amodio, 2014). In general, people's initial categorizations of multiracial individuals may be important mechanisms for understanding how they are perceived and treated by others. Thus, the current research sought to investigate how multiracial individuals are racially categorized in everyday social perception. Our investigation focuses on categorizations of Black-White multiracial individuals, who have been and continue to be the largest mixed race group in the U.S. (Jones & Bullock, 2012) and are the most researched within the multiracial categorization literature to date (see Shih & Sanchez, 2009; Young, Sanchez, Pauker, & Gaither, 2018).

Historically, U.S. laws and court cases dictated that people of Black-White mixed race backgrounds were to be categorized as Black, that is, according to the principle of hypodescent (Harris, 1964). Hypodescent served as a legal mechanism to deny part-Black multiracial persons the rights and privileges that were exclusively afforded to monoracial Whites (see Davis, 1991). Many recent studies have shown that perceivers engage in hypodescent when categorizing Black-White multiracial individuals in that they categorize them as Black more often than as White (Cooley, Brown-Iannuzzi, Brown, & Polikoff, 2017; Freeman, Pauker, & Sanchez, 2016; Gaither, Pauker, Slepian, & Sommers, 2016; Ho, Sidanius, Levin, & Banaji, 2011; Ho, Sidanius, Cuddy, & Banaji, 2013; Krosch & Amodio, 2014; Krosch, Bernsen, Amodio, Jost, & Van Bavel, 2013; Peery & Bodenhausen, 2008, Experiment 1; Roberts & Gelman, 2015). Thus, from the existing social psychological literature, one could conclude that multiracial individuals are categorized according to the rule of hypodescent.

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Yet, hypodescent is a rule that specifies how to categorize individuals with part-Black *ancestry* (Davis, 1991; Jordan, 2014). Although several studies documenting hypodescent do manipulate targets' ancestry (e.g., Ho et al., 2011, Ho, Roberts, & Gelman, 2015, Ho, Kteily, & Chen, 2017; Peery & Bodenhausen, 2008; Roberts & Gelman, 2015; Skinner & Nicolas, 2015; Young, Sanchez, & Wilton, 2013), many studies that claim to have documented hypodescent do so with paradigms that present multiracial faces without ancestral information (e.g., Chen, Couto, Sacco, & Dunham, 2017, Experiments 2 & 3; Cooley et al., 2017; Freeman et al., 2016; Gaither et al., 2016; Halberstadt, Sherman, & Sherman, 2011; Krosch & Amodio, 2014; Krosch et al., 2013). However, perceivers' categorization of multiracial individuals without ancestral information is not consistent with the original definition of the hypodescent categorization rule (Jordan, 2014). One possible interpretation of these findings is that perceivers applied hypodescent to ambiguous faces because they have *assumed* mixed ancestry of the ambiguous-looking targets. As such, the appearance-only studies may suggest that perceivers still apply the hypodescent rule by inferring that ambiguous-looking targets have Black-White ancestry and consequently categorizing them as Black. Put differently, given that hypodescent is a historically significant rule in U.S. race relations (Davis, 1991), it is possible that hypodescent has become a heuristic that perceivers readily apply to ambiguous faces.

Although in this sense hypodescent is still one possible categorization rule applied to Black-White multiracial faces, we argue that it is not the only one. Our overarching research goal was to understand how perceivers categorize multiracial individuals at a first encounter, on the basis of their facial appearance alone. To provide a sufficiently broad test of how people categorize multiracial individuals based only on their appearance, it was necessary to expand beyond the methodologies of previous studies that investigated and documented hypodescent. Specifically, hypodescent arose in a context that was characterized by a Black-White dichotomy, that is, in which race relations in America were largely centered on Black-White relations (Jordan, 2014). Many studies on multiracial categorization mirror that historic racial dichotomy, using paradigms in which perceivers choose whether the target is Black or White (e.g., Chen et al., 2017; Ho et al., 2011, 2013; Krosch et al., 2013; Peery & Bodenhausen, 2008, Experiment 1). Yet, people may not think in racially dichotomous, or “Black and White,” terms. In fact, we argue that racial categorization in modern society is not a binary decision (U.S. Census, 2010).

Today's social perceivers are regularly exposed to members of a wide array of racial and ethnic groups, either through direct contact or through various media outlets. Because Black-White biracial faces often do not easily “fit” the Black category prototype (Chen & Hamilton, 2012; Freeman, Pauker, Apfelbaum, & Ambady, 2010; Willadsen-Jensen & Ito, 2006), the perceiver might categorize these biracial faces based on perceived similarity to other category prototypes (Medin, 1989). The salience or accessibility of alternate racial categories may be experimentally heightened (e.g., “Black” in a two-choice task or “Multiracial” in a three-choice task), and may also vary naturally between individuals (e.g., depending on the diversity of their environments; Pauker, Carpinella, Lick, Sanchez, & Johnson, in press). Some of the categorizations may be congruent with those individuals' ancestries (e.g., Black, White), and some of them may not (e.g., Latino). In light of the increasing accessibility of non-Black, non-White racial categories, it is necessary for researchers to consider *broader* categorization patterns that may be applied to Black-White multiracials (see Feliciano, 2016; Harris, 2002; Herman, 2010). This goal can only be fulfilled with the use of less restrictive categorization paradigms that do not assume categorizations of multiracials will be either Black or White. The current research addressed these methodological and conceptual limitations of previous research.

Supporting our proposal that multiracial categorization is more complex than a dichotomous choice, previous research using less constrained categorization tasks often do not document predominantly Black categorizations of Black-White multiracials. Specifically, perceivers are more likely to make *Multiracial* categorizations of multiracial individuals when given this third option in the task (Chen & Hamilton, 2012; Chen, Moons, Gaither, Hamilton, & Sherman, 2014; Gaither, Chen, Pauker, & Sommers, 2018). Other studies have documented that perceivers frequently categorize biracials as Latino (Feliciano, 2016; Tskhay & Rule, 2015; see also Harris, 2002). Since the predominant categorization of these faces was not Black, these results are inconsistent with the notion that perceivers engage in hypodescent as a default inference or categorization of Black-White multiracial faces. Yet, as these studies also did not manipulate targets' ancestral background, their findings should not be considered to be in direct opposition of hypodescent but, rather, indicative of the need for researchers to clearly distinguish between multiracial categorization processes when targets' ancestries are unknown versus known.

Given the discrepant findings in how multiracial targets are categorized based on their faces alone, there is clearly a need to discover guiding principles of the categorization of multiracial individuals at first encounter. We propose that the categorization of multiracial faces whose ancestries are unknown is guided by a tendency for perceivers to place a multiracial person in a socially subordinate, non-White racial category, that is, exhibit a *minority bias* in the categorizations of multiracials. Whereas the minority bias describes a tendency for a multiracial person to be categorized into *any* non-White (i.e., racial minority) group, hypodescent describes the more specific case in which a multiracial person is categorized as a member of the lower status racial category that maps onto their ancestry (Davis, 1991; Jordan, 2014). As reviewed above, researchers have documented perceivers' willingness to label multiracial faces as Black, Multiracial, and Latino more frequently than as White. These findings suggest a general tendency to exclude multiracials from the highest status racial group, White, that subsumes the more specific pattern of hypodescent, when targets are categorized according to their lower-status ancestry (even if that ancestry is only inferred or assumed by the perceiver). The proposed minority bias dovetails nicely with sociological work proposing that U.S. society is shifting away from a binary Black/White structure and towards a skin color-driven social structure in which dark individuals are categorized as Black, light individuals are categorized as White, and individuals with intermediate skin tone levels are categorized as Latino (Feliciano, 2016).

To test the proposed minority bias, we employed a series of unconstrained categorization tasks to assess perceivers' categorizations of multiracial faces in three experiments. Although our studies were not designed to test for hypodescent as it was originally defined (because targets' ancestries were never presented), we also tested for hypodescent-consistent categorization patterns (i.e., Black > White categorizations) to facilitate comparison of our results with previous studies in this research area.

1. Experiment 1: Implicit Categorization of Multiracials

Experiment 1 was the first study to date that tested perceivers' categorizations of multiracial faces without constraining their responses in any way. Moreover, we sought to use a paradigm that did not instruct participants to engage in racial categorization, and one in which perceivers would not even have to verbalize a category for each face. To this end, we used the classic Who Said What paradigm (Taylor, Fiske, Etcoff, & Ruderman, 1978) to measure perceivers' implicit categorization of multiracial individuals.

The Who Said What paradigm was developed to determine the extent to which social categories are spontaneously used in social perception. In the first phase of the paradigm, the Learning Phase, participants believe they are taking part in a memory experiment. They view members of different race groups (or any social category of interest) who make different statements. Each stimulus item typically consists of a group member's face accompanied by a statement made by that

person. The same group members are presented several times, accompanied by different statements they have made. In the second phase, the Memory Phase, participants are shown the array of faces presented in the first phase, along with a listing of all of the statements. For each statement participants are asked to identify the person who said it. Evidence of categorization at encoding is supported by the nature of the errors made by perceivers in the Memory Phase. Specifically, perceivers are more likely to misattribute statements made by a Black speaker to another Black individual than to a White individual (Taylor et al., 1978). In other words, they make more within-category errors than between-category errors in the Memory Phase. This result provides evidence that participants spontaneously encoded the race of the speaker during the Learning Phase. A clear benefit of the Who Said What paradigm is that it is an unobtrusive measure of categorization in that it makes no explicit reference to racial categories or instructions to categorize by race. Instead, perceivers' encoding of race is inferred from the types of errors made in the Memory Phase.

In the current experiment, we presented participants with photos of speakers who were Black, White, and Black-White multiracial during the Learning Phase. There were competing predictions. Based on previous studies suggesting that perceivers find Black-White faces to be not exactly Black or White (e.g., Chen & Hamilton, 2012), we could predict that participants would perceive multiracial targets as a third, separate group. Based on this prediction, we would expect that participants would implicitly categorize Black, Multiracial, and White targets into three distinct groups, as evidenced by more within-category than between-category errors for each type of target.

Alternatively, evidence consistent with hypodescent would predict that participants would categorize Black-White multiracials as Black. Support for hypodescent as the primary categorization principle guiding participants in this experiment would be manifested in the data if multiracial targets were implicitly categorized into the same group as Black targets (i.e., equal or greater misattributions of multiracials' statements to Black targets than within-category errors). If hypodescent is not the primary categorization principle, results could still support hypodescent as a secondary categorization strategy if perceivers' between-category errors showed a greater likelihood of misattributing multiracials' statements to Black targets than to White targets. We investigated these possibilities in the current experiment.

2. Method

2.1. Participants

Our sample size goals for this study and the subsequent studies were driven by the norms in this research area.[1] We sought at least 50 participants, and sample size was determined before any data analysis. We ran the study over the summer term at a public university and did not reach our sample size goal. We recommenced running the study for the first two weeks of the fall term. The final sample included seventy-two undergraduates (51 females, 1 unspecified; M_{age} = 20.51 years, SD = 2.15) who participated in exchange for partial course credit. Of these, there were 44 Asian, 11 White, 5 Latino, 4 Mixed, 2 Black, 1 Native Pacific Islander, and 5 Other-identified participants.[2]

2.2. Materials

Participants were shown a series of photos, each accompanied by a statement. We used photos of real Black, White, and Black-White multiracial faces. There were three male faces per racial category.[3] The monoracial faces were obtained from Minear and Park (2004), and the multiracial faces were photos of real Black-White multiracial individuals collected by Pauker, Ambady, and Freeman (2013) and used in Chen et al. (2014). All of the faces displayed neutral expressions. The faces were masked (no hair cues shown) and printed as 4 × 6 inch photos. A pretest of the faces used for this and Experiment 2 confirmed that the biracial faces were more ambiguous and less prototypical than the monoracial faces (refer to SOM for details).

For the Who Said What dialogue, we used sentences adapted from Altshteyn and Cosmides (2012). The sentences were not race-related and generally described personal preferences and interests (e.g., “I like going to the park when the weather is nice” and “I really enjoy watching good comedy and adventure movies”).

2.3. Procedure

Participants came into the lab and learned that they would be participating in a study on memory. They were told that, in the Learning Phase, they would be viewing faces of individuals with accompanying sentences that those individuals had said and that their task was to remember which person made which statement. During the Learning Phase, each target person was shown three times, paired with three different sentences. Across the nine target faces, this created a total of 27 trials of photo-sentence pairings, which were presented to participants in random order. The Learning Phase was followed by a one-minute filler task. Next, participants completed the Memory Phase, in which they were shown all nine targets on the screen. For each of the 27 sentences, presented one at a time, participants were asked to select which of the nine targets said that sentence during the Learning Phase. Finally, participants responded to individual difference measures and demographic information.[4]

2.4. Design

The design of the study was a 2 (Replication: A or B) × 3 (Target Race: Black, Multiracial, and White) mixed design, with the latter factor being within subjects.[5] Replication refers to the particular pairings of faces with sentences. For example, in replication A (N = 38), a particular photo was paired with three particular sentences. In replication B (N = 34), we made sure that each photo was not paired with any of the same sentences it had been paired with in replication A. We included this factor to insure that our findings were not idiosyncratic to the particular pairings of faces and sentences. The dependent variable was the frequency of different types of errors (within- vs. between-category) in the memory phase.

[1] During the execution of this research, sample size norms changed. Exp. 2 was run in mid-2012, Exp. 1 was run in late 2012, and Exp.3 was run in 2014. We attempted to increase sample sizes in each subsequent study in line with these changing norms. Specifically, we aimed for at least 40 participants in Exp. 2, 50 participants in Exp. 1, and 100 participants in Exp. 3. (All of these studies have within-subjects designs.)

[2] Analyses conducted without self-identified Multiracial and self-identified Other participants across all three studies did not alter significance levels of the results reported, with only a few exceptions. These exceptions are reported in the SOM and do not change the conclusions drawn.

[3] Our goal in this study was to examine racial categorization while holding other visible social categories constant. Therefore, we kept the gender and age group of targets constant across the stimuli in this study by presenting young adult male faces (photos of which had been used in previous research).

[4] The individual difference measures assessed participants' levels of racial essentialism, interracial contact, motivation to control prejudice, racial identification, and racial prejudice. These measures were included for exploratory purposes and are contained in the posted datasets. In all three studies, we report all measures, manipulations, and exclusions.

[5] Correlations among repeated measures (for all three studies) are reported in the Supplemental Material.

3. Results

3.1. Recall performance

First, to provide context for the analysis of error types, we examined levels of accurate recall by target race. We conducted a 2 (Replication) × 3 (Target race) mixed model ANOVA on participants' recall accuracy. There was a significant main effect of target race, $F(2, 140) = 10.43$, $p < .001$, $\eta_p^2 = 0.13$. No other significant effects were found, $ps > 0.98$. Follow-up pairwise comparisons revealed that participants were significantly less accurate in remembering statements by multiracial targets ($M = 2.24$, $SD = 1.44$) than by Black targets ($M = 3.01$, $SD = 1.61$) or by White targets ($M = 3.15$, $SD = 1.69$), $ps < 0.001$. Accuracy for statements by Black and White targets did not differ, $p = .52$. These results conceptually replicate those of Pauker et al. (2009), who found that ambiguous appearance leads to decreased memory for individuals.

3.2. Implicit categorization: within- and between-group errors

Of primary interest to the current investigation was the nature of the memory errors. We first computed the number and type of errors made by each participant. Note that, by chance alone, there will be three times as many between-race than within-race category errors. Therefore, we corrected for chance by dividing the between-category errors by three (Taylor et al., 1978).

Next we conducted a 2 (Replication) × 3 (Target race) × 2 (Error type) mixed-model ANOVA on the number of errors made. As expected, there was a main effect of error type, $F(1, 70) = 35.89$, $p < .001$, $\eta_p^2 = 0.34$. Participants made significantly more within-category errors ($M = 2.16$, $SD = 0.93$) than between-category errors ($M = 1.34$, $SD = 0.42$), replicating the outcome typically obtained by this paradigm. There was also a significant error type by replication interaction, $F(1, 70) = 6.04$, $p = .01$, $\eta_p^2 = 0.08$, driven by the fact that participants in Replication A made more within-category errors than did participants in Replication B. However, there was no significant three-way interaction with target race, $p = .39$. Important for our theoretical predictions, the target race by error type interaction was not significant, $p = .17$, $\eta_p^2 = 0.03$; means are shown in Fig. 1. We then conducted follow-up pairwise comparisons to confirm that within-category errors were in fact greater than between-category errors for each of the target groups. Indeed, participants made more within-category errors than between-category errors for Black targets, $p < .001$, multiracial targets, $p = .02$, and White targets, $p < .001$. These findings indicate that participants implicitly categorized targets into three distinct racial groups, consistent with the minority bias and inconsistent with the inclusion of multiracials in the Black category as predicted by hypodescent.

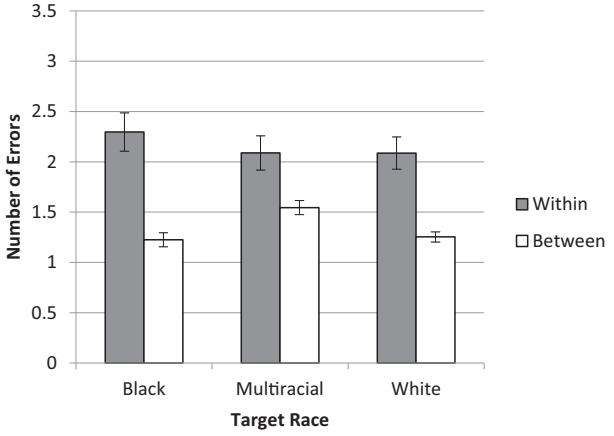

Fig. 1. Mean number of errors, with standard error, by error type and target race in Experiment 1.

We also analyzed the nature of the between-category errors specifically for multiracial targets. Categorization processes consistent with hypodescent would manifest in multiracial targets' statements being attributed to Black targets more often than to White targets. We computed the number of times each participant confused multiracial targets' statements as belonging to Black targets ($M = 2.39$, $SD = 1.44$) and White targets ($M = 2.22$, $SD = 1.40$). A paired samples t-test showed that participants were not significantly more likely to remember multiracials' statements as belonging to Black than to White targets, $t(71) = 0.64$, $p = .52$. This result is not consistent with hypodescent.

4. Discussion

Experiment 1 results suggested that perceivers categorized multiracials as a third group rather than as White or as Black. In addition, the between-category errors did not reveal any evidence consistent with hypodescent, in that participants were equally likely to misattribute a multiracial target's statement to a White target as to a Black target. These findings illustrate a tendency for perceivers to differentiate Black-White biracials from both Black people and White people. Using a different methodology, they conceptually replicate the results of Chen and Hamilton (2012) and suggest that the commonly used two-category response option may overestimate the prevalence of perceivers' categorizations of multiracials as Black. More broadly, it is clear that researchers should employ diverse methodologies to understand the processes governing multiracial categorization.

Experiment 1 had a few limitations. First, there was an effect of the "replication" factor that varied the face-sentence pairings. However, it should be noted that the key results have been replicated in a follow-up study in which all face-sentence pairings were randomized (Chen et al., 2018). Second, the stimuli used were all male. We will address this limitation in the following two experiments by including male and female multiracial targets to test for the generalizability of the current findings. Third, it is possible that these findings could be due to "subtyping" of Black individuals such that perceivers saw biracials as a subcategory of lighter-skinned Black people (e.g., Maddox & Chase, 2004). Even if multiracial targets were generally categorized as "Multiracial," consistent with Chen and Hamilton (2012), it is possible that they were viewed as a subgroup of the superordinate "Black" racial category. Experiment 2 addressed the possible subtyping explanation of the results of Experiment 1 by asking participants to sort and label Black, White, and multiracial faces by race. If subtyping of biracial faces occurred, then we should see evidence of this in participants' sorting (i.e., they would sort multiracial faces into the same group as Black faces) and/or labeling (i.e., they would label multiracial faces and Black faces in a way that communicates subtyping, such as "light Black people" vs. "dark Black people" or "mixed Black people" and "Black people"). Utilizing different labels to distinguish between Black people on the basis of skin tone is a well-established process among Black Americans (e.g., Parrish, 1946; Wilder, 2010). We investigated these possibilities in Experiment 2.

5. Experiment 2: Free Sorting of Faces by Race

In Experiment 2, we examined perceivers' categorizations of multiracials using an open-ended sorting task. Sorting tasks have been used to yield rich and important information about how perceivers naturally categorize or classify social targets (e.g., Brewer, Dull, & Lui, 1981; Lickel et al., 2000). One advantage of the sorting method is that it avoids making any specific categories (e.g., Multiracial) or racial dichotomies (e.g., "Black or White") more salient than they naturally would be to the individual perceiver. In this experiment, participants were asked to sort photographs of Black, Black-White multiracial, and

White faces by race. Importantly, participants were not provided with any direction on how many groups to generate or what criteria to use for sorting.

We expected that participants would categorize the Black faces as Black and the White faces as White, as these faces most closely matched the prototype for each of these categories, respectively. Of key interest was how participants would sort the multiracial faces. If the ancestry of multiracial targets is inferred, then one might predict that hypodescent is a heuristic categorization rule applied to multiracial faces. Evidence for this process would manifest in predominantly Black categorizations of those faces, or at least more frequent categorizations of the faces as Black than as White. However, the results of Experiment 1 suggest that hypodescent is not the predominant categorization of multiracial faces, since they were differentiated from Black faces. These results instead suggest a minority bias, which would manifest in predominantly non-White categorizations of multiracial faces in the sorting task. Thus, consistent with Experiment 1's findings, we predicted that perceivers would generally categorize multiracials into non-Black, non-White categories.

It was also possible that perceivers would predominantly categorize faces as Multiracial. We refer to Multiracial categorizations of multiracial faces as a response pattern called *concordance* (see Chen & Hamilton, 2012; Harris, 2002). Previous studies in which participants categorize multiracial faces with the options of Black, White, and Multiracial have found that Multiracial is the most common response (e.g., Peery & Bodenhausen, 2008). However, Chen and Hamilton (2012) showed that the Multiracial categorizations of Black-White faces is disrupted easily by perceiver cognitive load and time constraints, indicating that the Multiracial category is less accessible and less easily applied compared to monoracial categories (see also Pauker et al., in press). Based on their analysis, it seemed unlikely that perceivers would most frequently spontaneously label multiracial faces as Multiracial. Nonetheless, the present study tested this possibility.

In sum, the present study examined free sorting of multiracial faces whose ancestries were unknown. Categorizations of these faces were compared for evidence of the minority bias, hypodescent, and concordance.

6. Method

6.1. Participants

We ran the study over the summer at a public university. Our sample size goal was 40 participants, and sample size was determined before any data analysis. Forty-one undergraduates (23 females; M_{age} = 19.58 years, SD = 1.34) participated in the study in exchange for partial course credit. The sample included 11 Asian/Asian Pacific Islander, 9 White, 7 Latino, 7 multiracial, and 1 Black individual. (Six participants did not complete the demographic questionnaire.)

6.2. Materials

We used 24 faces (50% female) in total: eight Black, eight White, and eight Black-White multiracial. As in Experiment 1 (which used a subset of the faces used here), the monoracial faces were obtained from Minear and Park (2004), and the multiracial faces were photos of real Black-White multiracial individuals collected by Pauker et al. (2013) and used in Chen et al. (2014). The faces were masked (no hair cues shown) and printed as 4 × 6 inch photos. Numbers 1–24 were randomly assigned to the photos and printed on the back.

6.3. Procedure

The experimenter greeted the participant and verbally explained the sorting task to the participant, explaining that he or she would be given a pile of photos to sort into as many or as few groups as he or she saw fit. Next, the experimenter gave the photos to the participant and asked him or her to sort the photos by race. The experimenter left the room while the participant completed the sorting task. After sorting the photos, participants recorded the number of groups they created and labeled each group. For each group, participants recorded which photos they placed in it. Finally, participants completed individual difference measures (the same exploratory variables as those in Experiment 1) and reported their demographic information.

7. Results

Participants generated the following categories when sorting the faces: Black, Latino, Middle-Eastern, Indian, White, Multiracial (or mixed), Asian, and Other (or Don't Know).[6] For each participant, we calculated the frequency with which he or she used the aforementioned categories when sorting the Black, White, and multiracial faces. Next, for each type of face, we calculated the proportion of times each category was used in sorting those types of faces (see Fig. 2).

First, we confirmed that the prototypical Black and prototypical White faces were perceived as such. We ran an 8 (Category) × 2 (Target Gender) repeated measures ANOVA on the categorizations of Black faces. There was a main effect of category, $F(7, 280) = 420.52$, $p < .001$, $\eta_p^2 = 0.91$. Pairwise comparisons confirmed that Black targets were categorized as Black ($M = 0.88$, $SD = 0.22$) significantly more than as any other group, all $ps < 0.001$. Target gender did not moderate this finding, $p = .38$. Then we ran an 8 (Category) × 2 (Target Gender) within-subjects ANOVA on participants' categorizations of White faces. There was a main effect of category used, $F(7, 280) = 1444.49$, $p < .001$, $\eta_p^2 = 0.97$. White categorizations ($M = 0.92$, $SD = 0.10$) were significantly more common than any other categorizations, all $ps < 0.001$. This effect was qualified by a significant target gender by category interaction $F(7, 280) = 4.68$, $p = .01$, $\eta_p^2 = 0.11$. Pairwise comparisons confirmed that both male and female White targets were categorized as White significantly more than as any other group, all $ps < 0.001$. The interaction was due to the fact that participants were significantly more likely to categorize White males ($M = 0.96$, $SD = 0.09$) than White females ($M = 0.88$, $SD = 0.10$) as White, $p = .01$.

As seen in Fig. 2, sorting of the multiracial faces was more heterogeneous. We conducted an 8 (Category) × 2 (Target Gender) within-subjects ANOVA on the categorizations of multiracial targets. There was a significant effect of category used, $F(7, 280) = 24.94$, $p < .001$, $\eta_p^2 = 0.38$. Table 1 shows the proportion of times each category was used in sorting the multiracial targets. Consistent with the minority bias rather than concordance or hypodescent, multiracials were categorized as Latino significantly more often than any other race, $ps < 0.001$. The next most frequent categorization was Middle Eastern, which was used significantly more than White ($p = .004$), Multiracial ($p = .01$), Asian ($p < .001$), or Indian, ($p = .004$), and at the same rate as Black ($p = .22$) and Other/Unknown categorizations ($p = .11$). Categorizations of multiracials as Multiracial were significantly less frequent than Latino categorizations, $p < .001$, Middle Eastern categorizations, $p = .01$, and Black categorizations, $p = .03$, but was used as frequently as White, $p = .84$. Therefore, consistent with the minority bias, participants most commonly sorted multiracials into several plausible non-White racial groups. There was also a significant target gender by category interaction, $F(7, 280) = 11.59$, $p < .001$, $\eta_p^2 = 0.23$. For both male ($M = 0.57$, $SD = 0.38$) and female targets ($M = 0.39$, $SD = 0.30$), categorizations as Latino were more frequent than any other categorization (Latino vs. Middle Eastern for female targets, $p = .02$; all other

[6] Participant responses were collapsed into these categories by two objective judges. For example, some participants used the label "African American" and others used the label "Black," and both groups of participants would be coded as having used the "Black" category. Agreement was 97.5% and a third objective coder resolved the disagreements.

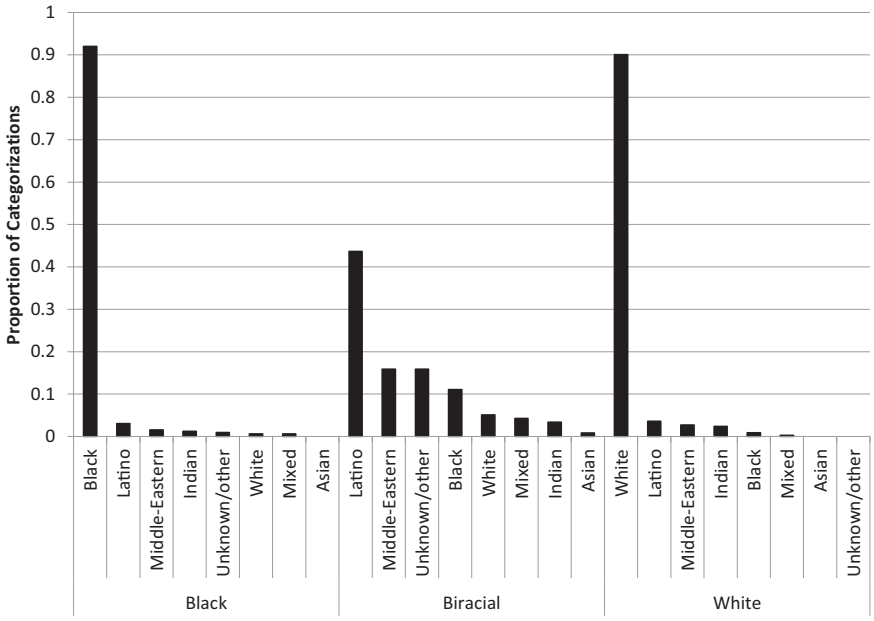

Fig. 2. Proportion of categorizations by target race in Experiment 2. Categorizations within are ordered from most to least frequent within each target race.

Table 1
Proportion of categorizations of biracial faces in Experiment 2.

Categorization	Proportion used	Standard deviation
Latino	0.43_{a}	0.26
Middle-Eastern	0.17_{b}	0.22
Black	$0.10_{b,c}$	0.12
Other/Unknown	$0.09_{b,c,d,e}$	0.22
Multiracial	$0.08_{c,d}$	0.14
White	$0.06_{c,d}$	0.09
Indian	$0.04_{d,e}$	0.11
Asian	0.02_{e}	0.06

Note: Proportion of times each category was used to sort multiracials in Experiment 2. Proportions with different subscripts differ from each other significantly ($p < .05$).

$ps < 0.01$). However, Latino categorizations were more frequent for male than female targets, $p < .001$, and Black categorizations were more frequent for female than male targets, $p < .001$.

Previous studies documenting hypodescent have typically used racially dichotomized categorization tasks. As is evident in Fig. 2, use of our free-response categorization task provided no evidence supporting hypodescent, because Black categorizations were not the most frequent categorization of multiracials. However, it remained possible that participants made more Black than White categorizations of multiracial faces. To test this possibility, we conducted a 2 (Categorization: Black or White) × 2 (Target Gender) within-subjects ANOVA on participants' categorizations of multiracials. There were significant main effects of target gender, $F(1, 40) = 13.33$, $p < .001$, $\eta_p^2 = 0.25$, and categorization, $F(1, 40) = 6.18$, $p = .02$, $\eta_p^2 = 0.13$. These were qualified by a significant target gender by categorization interaction, $F(1, 40) = 33.81$, $p < .001$, $\eta_p^2 = 0.46$. Pairwise comparisons revealed that participants categorized female targets as Black ($M = 0.21$, $SD = 0.23$) more often than as White ($M = 0.04$, $SD = 0.09$), $p < .001$, but were equally likely to categorize male targets as Black ($M = 0.03$, $SD = 0.08$) and as White ($M = 0.07$, $SD = 0.14$), $p = .18$. Therefore, there was some evidence consistent with hypodescent as a secondary categorization pattern for female, but not for male, multiracial targets.

8. Discussion

Experiment 2 used a sorting task to determine how participants would naturally categorize faces varying in racial ambiguity without imposing specific categories in a closed-ended task. Not surprisingly, Black faces were predominantly sorted as Black, and White faces were overwhelmingly sorted as White.

Participants' sorting of multiracial faces was more varied. Although there was no consensus in the specific racial group to which multiracials belonged, the majority of categorizations (approximately 94%) were into non-White racial groups. These results provided strong support for the minority bias. Further, most categorizations of multiracials were into non-Black minority groups (approximately 86%), indicating third group differentiation of multiracials. These results corroborate our interpretation of Experiment 1 findings as indicative of third-group categorization, rather than solely driven by feature-based differentiation of non-prototypical faces from prototypical ones within the same racial category. Importantly, in contrast to studies using dichotomous categorization tasks, we found that participants categorized multiracials as Black only marginally more often than as White, and only significantly so for female targets.

The Experiment 2 findings were also not consistent with a subtyping interpretation of Experiment 1 results. Specifically, multiracial faces were grouped apart from Black faces (indicating no superordinate categorization) and the only label that could be interpreted as a subgroup of Black people was “Multiracial.” Together, the “Black” and “Multiracial” categorizations only made up approximately 18% of the categorizations of multiracial faces. Instead, multiracial faces were most frequently labeled as Latinx, a category that is not typically considered a subcategory of Black people.

It is interesting to note that the two most frequent categorizations of multiracials—Latinx and Middle Eastern—do overlap with the Black category in some way, because many Latinxs have African heritage and because the Middle East occupies part of Northern Africa and its people share some phenotypic overlap with other African peoples. Despite these overlaps, we would argue that perceivers do not readily perceive the overlap between Latinx and Black or Middle Eastern and Black categories. Supporting this point, Ghavami and Peplau (2013) found that the stereotypes of Black and Middle Eastern individuals have oppositional content (poor vs. rich; unintelligent vs. intelligent, respectively), as do Black and Latinx groups (e.g., tall vs. short; lazy vs. hard-

working). Further, the nature of cognitive categorization systems is such that perceivers distinguish between categories in ways that maximize the differences between them (e.g., Krueger, 1992). Thus, it is unlikely that perceivers recognized the overlap between Latinx and Black or Middle Eastern and Black and, consequently, it is not straightforward to interpret Experiment 2 results as supporting hypodescent.

Experiment 2 also demonstrated that perceivers very rarely spontaneously categorize multiracials as "Multiracial" (< 10% of the time). Although participants categorized the multiracial faces as Multiracial as often as categorizing them as Black or White, Multiracial categorizations only occurred in approximately 8% of the categorizations of multiracial faces in this sorting task. This is a much lower rate of multiracial categorizations than observed in past research that has included a "Multiracial" category (e.g., Chen & Hamilton, 2012; Peery & Bodenhausen, 2008, Experiment 2). Our results suggest that the inclusion of a "Multiracial" category in a categorization task increases the likelihood that it will be used. These findings further support the argument that a Multiracial category is not as well-developed or cognitively accessible as monoracial categories (Chen et al., 2014; Chen & Hamilton, 2012).

Although Experiment 2's categorization task had many fewer constraints on participants' responses compared to close-ended tasks used in the past, participants' responses *were* constrained such that they could only sort each face into one category. Although our task precluded the possibility that participants could place a face into multiple racial groups, it does reflect the American lay theory that racial categories are mutually exclusive (e.g., Eberhardt & Randall, 1997; Rothbart & Taylor, 1992). It is possible that priming participants with a more flexible view of race, such as explicitly instructing them to consider that faces may go into multiple groups, could reduce their endorsement of racial categories as discrete and inflexible (see Pauker, Carpinella, Meyers, Young, & Sanchez, 2017).

9. Interim Summary

The results of Experiments 1 and 2 clearly suggest that using two-category tasks, which narrow perceivers' categorizations to either Black or White, can lead to an overestimation in the extent to which perceivers categorize multiracial faces as Black. Instead, the results of Experiments 1 and 2 have supported a *minority bias* in multiracial categorization. Specifically, although participants' categorizations of multiracials seemed to lack consensus, participants predominantly categorized multiracials into racial minority groups. Experiment 1 demonstrated that multiracials were differentiated from White people and from Black people, suggesting that they were perceived as a third group, both non-White and non-Black. Experiment 2 corroborated these findings and showed that perceivers tended to categorize multiracials as racial minorities, with Latino and Middle Eastern being the most frequent categorizations. These results suggest that perceivers' most frequent categorization of multiracials is more generally "not White" or "a person of color."

Why might a minority bias in multiracial categorization occur? Previous work has documented a White/non-White default in social categorization (e.g., Stroessner, 1996; Zarate & Smith, 1990), indicating that perceivers are spontaneously assessing where novel individuals fall on this intergroup distinction. We argue that, when encountering a racially ambiguous individual, perceivers readily judge whether the target is White or non-White, and that this judgment typically results in more non-White than White judgments. If perceivers are indeed spontaneously using a White/non-White category norm, then their categorizations of multiracial faces as "non-White" should not only be more frequent than specific categorizations into minority groups, but they should also be faster. In other words, perceivers should be faster to exclude multiracials from the White category than to include them in a minority category. We investigated the minority bias process further in Experiment 3.

10. Experiment 3: Time Course of the Minority Bias

Experiment 3 tested for additional evidence of the minority bias, focusing on whether exclusion of multiracial faces from the White category occurred more frequently and more quickly than other categorizations of multiracial faces. To this end, we presented participants a series of multiracial faces and varied the category judgment task that they were asked to perform. We used the five most frequent categorizations of multiracials generated by participants in the sorting task in Experiment 2—Latino, Middle Eastern, Black, Multiracial, and White—to guide participants' categorizations in this experiment. On each trial, participants viewed a multiracial face and a specific category prompt, which appeared at the bottom of the screen (e.g., "Latino?"). Participants' task was to respond "yes" or "no" to each category prompt. This paradigm allowed us to measure the categorizations of multiracial faces into five different categories independently and to assess response latencies for each decision (see Stroessner, 1996, for a similar method).

With respect to the categorizations themselves, the minority bias would predict that participants would exclude multiracials from the White category more frequently than including them in any of the minority categories. Evidence consistent with hypodescent would manifest if participants categorized multiracials as Black more frequently than as any other race, including as White.

We also determined whether categorizations of multiracial faces as "not White" (i.e., "no" responses to the "White?" prompt) occurred faster than other categorizations of these faces. This result would be consistent with a White/non-White default in social categorization. With respect to response latencies of categorizations, an alternative hypothesis was derived from a category competition perspective. In particular, multiracial faces may activate both Black and White categories and perceivers may experience conflict regarding which one to select (Freeman et al., 2010; Freeman et al., 2016). This reasoning would predict that perceivers' responses to Black and White category prompts would be *slower* than their responses to other category prompts.

In sum, Experiment 3 sought to provide additional evidence of the minority bias while testing alternative predictions derived from hypodescent (frequencies of categorizations) and category competition (categorization response latencies). Support for the minority bias would be manifested from the combination of two findings: 1) that exclusions from the White category are more frequent than inclusion into any single minority categorization and 2) that responses to the White category prompt are faster than responses to any other category prompt, and specifically that White category exclusions are faster than minority category inclusions.

11. Method

11.1. Participants

We sought at least 100 participants, and sample size was determined before any data analysis. We collected data during a three-week period at a large public university. The final sample included one hundred and eleven undergraduates (86 females; M_{age} = 19.91 years, SD = 2.18) who participated in exchange for partial course credit. Of these, 60 identified as Asian American, 26 as Latino, 13 as White, three as Pacific Islander, and nine as "Other."

11.2. Materials

Because this experiment was specifically focused on categorizations of racially ambiguous faces, we only included multiracial face stimuli in the experimental trials. Face stimuli were created using morphing software (Morpheus Photo Morpher; www.morpheussoftware.net).

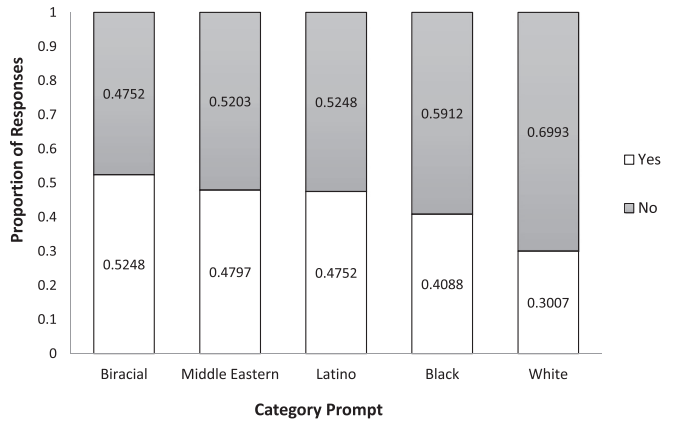

Fig. 3. Average categorizations of multiracial faces by category prompt in Experiment 3.

Forty multiracial faces (20 female) were created by morphing one Black face (50%) with a same gender White face (50%). For the sake of comparison, we also created 40 Black and 40 White faces by morphing two Black and two White faces together, respectively. A pretest ($N = 66$) confirmed that the morphed Multiracial faces were significantly more ambiguous than the morphed Black faces and morphed White faces, $ps < 0.001$. This set of faces was also used by Freeman et al. (2016) to study multiracial categorization processes (and documented hypodescent in the categorizations of the multiracial faces in a two-category Black/White categorization task).

11.3. Procedure

The experiment was programmed using Empirisoft's DirectRT. After providing informed consent, participants were instructed that they would be categorizing faces by race. In each trial, a face was displayed in the center of the computer screen for 500 ms before a category prompt appeared at the bottom of the screen. There were five different racial category prompts – Latino, Middle Eastern, Black, Biracial, and White. For example, participants would view a multiracial face and then below the face would appear "Latino?" with "yes" on the bottom left side of the screen and "no" at the bottom right side of the screen. Whether the "yes" or "no" response option appeared on the left or right side of the screen was counterbalanced across participants. Prior to the experimental trials, participants categorized 20 practice faces (4 per racial category) to familiarize themselves with the procedure. The practice faces were nine additional Black-White multiracial morphs (used in Chen & Hamilton, 2012; Peery & Bodenhausen, 2008). These faces were randomly selected (with replacement) with the five racial categories by the computer. In the experimental trials, the computer randomly selected four female and four male faces (without replacement) per category prompt. Participants viewed the multiracial faces one at a time and in random order. Participants' categorizations and response times were recorded. After the categorization task, participants responded to individual difference measures (the same as those in Studies 1 and 2) and reported their demographic information.

11.4. Design

The experiment had a 2 (Response Option Key Counterbalancing) × 5 (Category Prompt: Latino, Middle Eastern, Black, Biracial, and White) × 2 (Target Gender) mixed design, with the latter two factors within-subjects. The dependent measures were responses to the category prompts and response latencies. Because the response option key counterbalancing did not affect results, the analyses reported below are collapsed across this factor.

12. Results

12.1. Categorizations of multiracials

We calculated the proportion of times that each participant categorized multiracial faces as Latino, Middle Eastern, Black, Biracial, and White. Then we conducted a 2 (Target Gender) × 5 (Category) within-subjects ANOVA on the proportion of times participants placed the face into each category. There was a main effect of category, $F(4, 440) = 15.79$, $p < .001$, $\eta_p^2 = 0.13$ (see Fig. 3). The most common categorizations were Biracial ($M = 0.53$, $SD = 0.26$), Middle Eastern ($M = 0.48$, $SD = 0.22$), and Latino ($M = 0.48$, $SD = 0.25$), and these categorizations occurred with equal frequency (Biracial vs. Middle Eastern, $p = .14$; Biracial vs. Latino, $p = .11$; Latino vs. Middle Eastern, $p = .88$). Black categorizations ($M = 0.41$, $SD = 0.23$) were significantly less common than Biracial, $p < .001$, Latino, $p = .04$, and Middle Eastern, $p = .02$, categorizations. As predicted, White categorizations ($M = 0.30$, $SD = 0.25$) were significantly less common than any other categorization, (White vs. Black, $p = .002$, all other comparisons, $ps < 0.01$). Further, the most frequent categorization (Biracial; made approximately 50% of the time) was not made as frequently as exclusion from the White category (the White prompt elicited "No" responses approximately 70% of the time), supporting the minority bias.

There was a marginal main effect of target gender, $F(1, 440) = 3.29$, $p = .07$, $\eta_p^2 = 0.03$, and a significant target gender by category interaction that revealed slight differences between categorization patterns for male and female targets, $F(4, 440) = 11.33$, $p < .001$, $\eta_p^2 = 0.09$. For female targets, Latino ($M = 0.51$, $SD = 0.32$), Biracial ($M = 0.50$, $SD = 0.31$), and Middle Eastern ($M = 0.55$, $SD = 0.28$) categorizations remained the most common categorizations and did not differ from each other in frequency (Latino vs. Biracial, $p = .68$, Latino vs. Middle Eastern, $p = .36$, Biracial vs. Middle Eastern, $p = .15$). Black and White categorizations were equally rare (both $Ms = 0.35$, $SD_{black} = 0.28$, $SD_{white} = 0.29$, $p = 1.00$) and significantly less frequent than the other three categorizations, $ps < 0.001$. For male targets, categorizations as Biracial ($M = 0.55$, $SD = 0.33$) were more common than the other categorizations (Biracial vs. Black, $p = .02$; Biracial vs. Latino, $p = .004$; all other comparisons, $ps < 0.001$). Black ($M = 0.47$, $SD = 0.29$), Latino ($M = 0.44$, $SD = 0.30$), and Middle Eastern ($M = 0.41$, $SD = 0.29$) categorizations were the next most common categorizations and were equally frequently made (Black vs. Latino, $p = .49$; Black vs. Middle Eastern, $p = .18$, Latino vs. Middle Eastern, $p = .45$). White was significantly less common than any other categorization ($M = 0.25$, $SD = 0.30$), all $ps < 0.001$. Therefore, White was the least common categorization of male targets, and Black and White categorizations were least frequent categorizations of female targets. Overall these results supported the minority bias in that participants were least likely to include multiracial targets in the White category.

12.2. Response latencies for categorization judgments

We cleaned participants' response latencies by recoding response times < 300 ms and > 3000 ms with those values, respectively (6.6% of responses; e.g., Chen & Hamilton, 2012; Peery & Bodenhausen, 2008). Of key interest was participants' response latencies to the White category prompt in comparison to the other category prompts. Our predictions for response latencies were that participants would respond most quickly to the White category prompt and that they would be faster to exclude multiracial targets from the White category than to include them into any minority category. Fig. 4 shows the mean response latencies by category prompt and response type (yes or no). Several analyses were conducted on these data.

First, we conducted a 2 (Target Gender) × 5 (Category Prompt) within-subjects ANOVA on response latencies, collapsing across participants' responses (yes or no) to each prompt. There was a significant

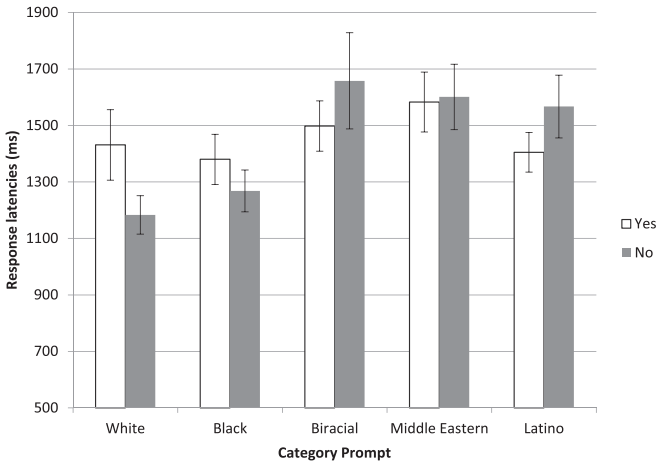

Fig. 4. Response latencies (ms) to each category prompt by response (yes or no) in Experiment 3. Error bars depict standard error.

main effect of category prompt, $F(4, 440) = 28.03$, $p < .001$, $\eta_p^2 = 0.20$. Follow-up pairwise comparisons revealed that participants responded equally quickly to the White category ($M = 1173$, $SD = 413$) and the Black category ($M = 1210$, $SD = 420$), and these judgments were made more quickly than any to any other category prompt, all $ps < 0.001$. Participants next responded to Latino ($M = 1368$, $SD = 455$), Middle Eastern ($M = 1411$, $SD = 472$), and Biracial ($M = 1386$, $SD = 455$) categories equally quickly (Latino vs. Middle Eastern, $p = .12$, Latino vs. Biracial, $p = .50$; Middle Eastern vs. Biracial, $p = .39$). There was also a significant target gender by category prompt interaction, $F(4, 440) = 5.59$, $p < .001$, $\eta_p^2 = 0.05$. Follow-up comparisons revealed that, for male targets, participants responded more quickly to the White category ($M = 1135$, $SD = 426$) than to any other category (White vs. Black, $p = .03$, all other comparisons, $ps < 0.001$). For female targets, participants responded more quickly to White category ($M = 1211$, $SD = 477$) and Black category ($M = 1190$, $SD = 420$) than to any other category prompt, $ps < 0.001$. Refer to Table 2 for all means and pairwise comparisons.

The response latencies just discussed were average response times across different proportions of "yes" and "no" responses to each category prompt. Next we directly tested whether exclusions from the White category were faster than inclusions into minority categories. Because not every participant made a "no" response to each of the five categories, we employed a series of paired samples *t*-tests to compare participants' response latencies for exclusions between two categories regardless of whether they had made exclusions to other categories. This strategy enabled us to include the maximum number of participants in our analyses. As hypothesized, participants were significantly faster to exclude participants from the White category than to categorize them into the Latino [$t(102) = -4.87$, $p < .001$, $d = -0.96$], Middle Eastern [$t(105) = -6.85$, $p < .001$, $d = -1.34$], Biracial [$t(104) = -5.18$, $p < .001$, $d = -1.02$], and Black categories [$t(102) = -2.62$, $p = .01$, $d = -0.52$]. Analyses separately by target gender yielded the same conclusions with one exception. Male targets were rejected as quickly from White as they were included in the Black category, $p = .12$. These results provided consistent support for the minority bias. However, they must be interpreted with caution because it is possible that "yes" responses are generally slower than "no" responses. To address this issue, we conducted another analysis comparing the average response latency to generate a "no" response to each category for each participant.

Table 2
Mean response times by category prompt in Experiment 3.

	Male targets	Female targets
White	$1135\ (426)_a$	$1211\ (477)_a$
Black	$1229\ (499)_b$	$1190\ (419)_a$
Biracial	$1335\ (436)_c$	$1438\ (509)_d$
Latino	$1399\ (481)_d$	$1336\ (490)_c$
Middle Eastern	$1439\ (488)_d$	$1384\ (509)_{cd}$

Note: Standard deviations are in parentheses. Means in the same column with different subscripts differ at the $p < .05$ level.

Based on our prediction that participants readily exclude multiracial targets from White more than any other category, we expected to find that participants' exclusions from White were faster than their exclusions from any other category. As predicted, participants were significantly faster to exclude participants from the White category than the Latino category [$M_{White} = 1174$, $SD_{White} = 518$, $M_{Latino} = 1522$, $SD_{Latino} = 805$; $t(106) = -6.61$, $p < .001$, $d = -0.64$], the Middle Eastern category [$M_{White} = 1169$, $SD_{White} = 520$, $M_{MidEast} = 1563$, $SD_{MidEast} = 926$; $t(106) = -6.46$, $p < .001$, $d = -0.64$], the Black category [$M_{White} = 1161$, $SD_{White} = 512$, $M_{Black} = 1256$, $SD_{Black} = 609$; $t(106) = -2.17$, $p = .03$, $d = -0.21$], and the Biracial category [$M_{White} = 1169$, $SD_{White} = 523$, $M_{Biracial} = 1667$, $SD_{Biracial} = 1329$; $t(102) = -4.00$, $p < .001$, $d = -0.40$]. Analyses separately by target gender yielded the same conclusions with one exception. For female targets, exclusions from Black were as fast as exclusions from White, $t(100) = -0.55$, $p = .59$.

13. Discussion

Experiment 3 provided novel insights about the processes involved in multiracial categorization. First, participants categorized the multiracials as "non-White" more frequently than they included them in any minority category. As in Experiment 2, Experiment 3 provided only limited evidence for hypodescent as a secondary categorization outcome; among male targets, participants' categorizations of multiracials as Black occurred significantly more frequently than their categorizations of multiracials as White. Therefore, analyses of the frequency of categorizations of multiracials revealed strong support for a minority bias, or tendency to categorize multiracials as "non-White," as a dominant categorization pattern for multiracial faces.

The second important insight provided by Experiment 3 was that participants responded the fastest to the White category prompt, were faster to exclude multiracials from White than to include them in any minority group, and were fastest to exclude targets from the White category than to exclude them from any other category. Together these results suggest that perceivers are more readily judging multiracials as White vs. non-White compared with other possible categorization distinctions (such as Latino vs. non-Latino). Further, the response latencies indicated no support for the dual activation of multiracials' parent racial categories, White and Black. This possibility would have predicted that perceivers would be slowest to respond to those category prompts due to experiencing conflict over "yes" and "no" answers. Instead we found that White and Black categorizations (both yes and no answers combined) were fastest. Overall, we found that non-White judgments were made the most rapidly of all category judgments considered, except for non-Black judgments, which were made as rapidly as non-White judgments for female targets. Thus, the combination of results from categorization responses and latencies showed that perceivers' non-White categorizations were most frequent and fastest categorizations of multiracials, clearly supporting a minority bias categorization pattern.

These results, combined with those from Experiment 2, also highlight the need for multiracial categorization research to explore the intersections of target gender, race, and context on categorization (Carpinella, Chen, Hamilton, & Johnson, 2015; Eagly & Kite, 1987; Ho et al., 2011; Johnson, Freeman, & Pauker, 2012) so that we can more fully understand the underlying processes of categorization. Although unexpected, the finding that female targets were more often and more quickly excluded from White and Black categories is consistent with

research showing that males are considered prototypical of these racial categories (see Johnson et al., 2012). However, with the focus of the present paper in mind, the results of Experiment 3 demonstrate that perceivers quickly and readily perceive multiracial faces as non-White, illustrating a novel categorization pattern in the perception of multiracial faces.

14. General Discussion

Whereas past research on multiracial categorization has largely focused on the historically significant Black-White context and documented predominantly Black categorizations of multiracial individuals, we have used less constrained categorization tasks to show that perceivers engage in another categorization pattern: a minority bias. Experiment 1 showed that perceivers differentiated Black-White biracials from Black and White targets, providing suggestive evidence that they implicitly categorized them into a separate racial group. Building on this foundation, Experiment 2 used an unconstrained sorting task to measure explicit categorization of multiracials and provided strong support for a minority bias. Finally, Experiment 3 examined the prevalence and time course of the minority bias. Extending the results of Experiments 1 and 2, we found that perceivers were more likely to categorize multiracials as non-White than to categorize them as a particular racial minority (i.e., Latino, Middle Eastern, Biracial, or Black). Importantly, Experiment 3 also demonstrated that perceivers were quicker to categorize multiracials as non-White than they were to apply any specific minority categorization. In sum, across three experiments using diverse methodologies, two stimulus sets, and racially heterogeneous samples, our research has documented that categorization of Black-White multiracials is subject to a minority bias.

The empirical support for a minority bias in multiracial categorization brings some clarification to the existing literature and raises important questions for future research. Our results clearly indicate the need for researchers to distinguish between the psychological processes involved in the categorization of multiracial faces when targets' ancestry is unknown vs. known. Although some studies have documented hypodescent when targets' ancestral backgrounds are known, many studies have reported results interpreted as showing hypodescent on the basis of multiracials' facial appearance alone (e.g., Chen et al., 2017; Cooley et al., 2017; Freeman et al., 2016; Gaither et al., 2016; Halberstadt et al., 2011; Krosch et al., 2013; Krosch & Amodio, 2014). On the basis of these previous studies, one could view hypodescent as a widely used heuristic, or default categorization process, that is employed when perceivers encounter multiracial individuals. However, our findings show that the categorization processes applied to multiracial faces are much more complex than a straightforward application of the hypodescent rule. In fact, we have found that perceivers quickly categorize multiracial faces as non-White and apply a wide range of minority categories to these targets.

Additional research is necessary to fully understand the processes by which perceivers choose the specific non-White category to which multiracials belong. Perceivers may be more likely to use categories that are salient or accessible. Their social environment may prime certain racial categories or lead to specific categories being accessible due to frequent and/or recent activation (Harris, 2002; Pauker et al., in press). Consistent with these ideas, Experiment 2 was conducted in a region where Latinxs are a salient minority group and found that Latinx was the most frequent categorization of multiracial faces (see also Feliciano, 2016). Perhaps perceivers in New York would be more likely to categorize multiracials primarily as Afro-Caribbean or Middle Eastern, rather than as Latinx. Future research should also consider whether the salience of racial dichotomies, such as Black versus White, impact perceivers' use of hypodescent. Would perceivers for whom the Black-White dichotomy is more salient be more likely to apply the hypodescent, rule even when targets' ancestries are unknown? In general, the specific non-White categorization made by perceivers may depend on the interaction of the target's racial ambiguity, the social context, and the experiential history of perceiver. These possibilities provide intriguing avenues for follow-up research that would provide valuable insights into how the perceiver's social context shapes social categorization more broadly for this growing racial demographic.

Another valuable question for future research is to identify the conditions under which the different principles of multiracial categorization occur. Both the minority bias and hypodescent theoretically reinforce the racial hierarchy by protecting the boundaries of the high status racial group, White. Consequently, motivations to protect the status quo (e.g., social dominance orientation; Sidanius & Pratto, 2001) may be positively related to both categorization tendencies but perhaps in different contexts. As mentioned in the Introduction, it is likely that the two categorization principles are most relevant at different stages of social interaction. The minority bias may dominate when the target's racial background is unknown to the perceiver, as in our experiments, whereas hypodescent may be more likely to occur when the target's racial ancestries *are* known to the perceiver (e.g., Barack Obama). Therefore, increased motivation to protect the status quo may lead to the minority bias for a multiracial target whose background is unknown (e.g., a first encounter) and to hypodescent when the target's background has been learned (e.g., initial stages of a social relationship).

Our research focused on understanding the perception of Black-White individuals who have racially ambiguous facial appearances. While these results may also generalize to monoracial individuals who appear racially ambiguous, future studies are needed to test whether the minority bias applies to multiracial people who are not racially ambiguous in appearance. These studies could investigate possible boundary effects of the minority bias to see if ambiguous physical appearance is a required condition for this pattern to occur, or if ambiguity can present in other ways, such as having incongruent cues across targets' appearance, voice, and behavior.

Furthermore, additional studies are needed to determine whether the minority bias occurs in the categorization of other types of multiracial individuals, including other minority-White multiracials and minority-minority multiracials. Interestingly, hypodescent has predominantly been discussed in terms of part-Black multiracial individuals, leading one prominent historian to argue that the rule "applies *only* to Americans of entirely or partially *African* descent" (Jordan, 2014, pp. 101). Yet, a few social psychological studies have documented patterns in the spirit of hypodescent in the categorization of Asian-White biracials in the U.S. (Ho et al., 2011) and New Zealand (Halberstadt et al., 2011). Building on the current research findings, studies are needed to test the minority bias in other racial mixtures. An interesting possibility is that the minority bias is stronger for Black/Latinx-White biracials than for Asian-White biracials, either for phenotypic (target-driven) reasons and/or for motivational (perceiver-driven) reasons. The minority bias could also be amplified by race-specific threats, such that a threat to safety could increase the minority bias for Black-White and Arab-White biracials but not for Asian-White biracials. In general, experiences of social identity threat (e.g., Kunstman, Plant, & Deska, 2016) and perceivers' emotional states (e.g., Isen, Niedenthal, & Cantor, 1992) could impact the strength of the minority bias. These possibilities address the generalizability and flexibility of the minority bias and warrant future research.

Our experiments utilized racially heterogeneous samples in which White perceivers were a numeric minority. While we believe that diverse samples strengthen the generalizability of our findings and that their inclusion is important for the production of scientific knowledge, the majority of previous research on categorization of multiracial individuals has relied primarily on White participants. Additional studies with large, homogeneous samples of both White perceivers and racial minority perceivers are necessary to test the generalizability of our findings.

Further, we believe that a particularly promising route for future research is to investigate the psychological underpinnings of the

minority bias. The minority bias may stem from a cognitive heuristic of the "White norm" (Hegarty, 2017; Stroessner, 1996; see also Devos & Banaji, 2005). Perceivers of any race could be motivated to engage in the minority bias due to their need to balance optimal distinctiveness needs (Brewer, 1991) or to address their need to belong (Gaither et al., 2016). The minority bias could also result from perceivers' stricter enforcement of the boundaries of the highest status group, White. This possibility converges with the findings from Chen et al. (2017; Experiment 1), who found that a racially heterogeneous sample of Americans rejected ambiguous-looking targets from the White category even if they only had White ancestry. In contrast, targets with Black ancestry and the same ambiguous appearance were included into the Black category. These findings suggest that both Whites and minorities apply more stringent criteria to Whiteness than to Blackness. In addition, some motives for the minority bias may differ depending on perceiver race. Among White perceivers, the minority bias could be a by-product of well-established tendencies to protect in-group boundaries from ambiguous members (Castano, Yzerbyt, Bourguignon, & Seron, 2002; Knowles & Peng, 2005) or to protect the status quo from which they derive advantages (Ho et al., 2013; Krosch et al., 2013). With respect to racial minority perceivers, we suggest that there are at least three reasons minorities may be motivated to engage in the minority bias. First, minorities are often motivated to justify the status quo (Jost & Banaji, 1994), and they often act in ways that reinforce the status quo (and consequently their subordinate status within it; Jost, Pelham, Sheldon, & Sullivan, 2003). Second, minorities may apply stringent criteria to a higher status racial out-group because they do not want to afford the power and privileges of that out-group membership to other individuals too liberally. In other words, minorities may be conservative in affording to others social benefits that they themselves do not enjoy. Third, minorities could also be motivated to include people in their in-group or in a superordinate "person of color" in-group in order to form political coalitions (Craig & Richeson, 2016; Ho et al., 2017). The possible motives underlying the minority bias raise particularly interesting avenues for future research and highlight the need for more research on minority perceivers' racial categorization processes.

Our results may have important implications for a range of downstream intergroup phenomena, including stereotyping of and discrimination towards multiracial individuals. For example, the initial categorization of a multiracial person may lead to certain expectations that guide and shape subsequent social interactions (e.g., Snyder, Tanke, & Berscheid, 1977; see also Gaither, Babbitt, & Sommers, 2018). A perceiver who categorizes a multiracial person as Latino will have different expectations for interaction than a perceiver who categorizes the same person as Black. For example, perceivers might expect a Latino-categorized multiracial to be an illegal immigrant, and whereas they might expect a Black-categorized multiracial to be on welfare (see Zou & Cheryan, 2017). Further, the possibility that multiracial people are categorized into a superordinate "person of color" category also raises the question as to what stereotypes are associated with this group, and how these expectations will shape others' behavior towards them. In general, the minority bias may lead perceivers to be less motivated to attend to, individuate, and remember multiracials, because they categorized them as members of stigmatized racial groups. These potential implications of our findings are important for understanding race relations in the U.S. and the multiracial experience in America and should be investigated in future research.

Although our results suggest that researchers' choice of categorization tasks may constrain perceivers' categorization processes, in particular the overestimation with which people categorize ambiguous faces as Black, we are not arguing that researchers should discontinue the use of constraining categorization tasks. Depending on one's research goals, it may be important that the researcher find evidence for specific processes in order to understand why they occur. For instance, researchers may want to investigate whether perceivers' explicit prejudice predicts their propensity to categorize ambiguous faces as Black or whether perceivers' endorsement of psychological essentialism reduces their likelihood of using a Multiracial category. Our goal is not to discourage this type of research. Rather, our goal has been to add to this literature by examining the categorization of multiracial individuals using tasks that could more closely mirror everyday social perception processes. In doing so, our research highlights the need for this literature to differentiate between ancestry known versus unknown situations. We hope that, by documenting the minority bias, provides valuable insights into additional psychological mechanisms underlying multiracial person perception.

The multiracial population in the United States is growing rapidly, yet social psychologists are only now beginning to understand how multiracial individuals are perceived and categorized. The ways in which perceivers negotiate the increased multiracialism in their social environments will have important implications for multiracials' social experiences and for the maintenance or evolution of existing social hierarchies. Our analysis has introduced new ideas and questions about the contextual nature of multiracial person perception and identifies a novel principle guiding multiracial categorization.

Open practices

The experiments in this article have earned Open Data badges for transparent practices. Data for the experiment are available at https://osf.io/daj2p/.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jesp.2018.05.002.

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