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A recognition advantage for members of higher-status racial groups

Deja Simon[1] | **Jacqueline M. Chen**[2,3] | **Jeffrey W. Sherman**[4] | **Jimmy Calanchini**[1]

[1]Department of Psychology, University of California, Riverside, Riverside, California, USA

[2]Department of Psychological Sciences, University of Connecticut, Storrs, Connecticut, USA

[3]Department of Psychology, University of Utah, Salt Lake City, Utah, USA

[4]Department of Psychology, University of California, Davis, Davis, California, USA

Correspondence
Jimmy Calanchini, Department of Psychology, University of California, Riverside, Riverside, CA, USA.
Email: jimmy.calanchini@ucr.edu

Abstract

The other-race effect (ORE) is a recognition memory advantage afforded to one's racial ingroup versus outgroup. The motivational relevance of the ingroup—because of relationships, belonging and self-esteem—is central to many theoretical explanations for the ORE. However, to date, the motivational relevance of outgroups has received considerably less attention in the ORE literature. Across six experiments, Black, White, Asian and Latinx American participants consistently demonstrated better recognition memory for the faces of relatively higher-status racial/ethnic group members than those of lower-status groups. This higher-status recognition advantage even appeared to override the ORE, such that participants better recognized members of higher-status outgroups—but not an outgroup of equivalent status—compared to members of their own ingroup. However, across a variety of self-reported perceived status measures, status differences between the high- and low-status groups generally did not moderate the documented recognition advantage. These findings provide initial evidence for the potential role of group status in the ORE and in recognition memory more broadly, but future work is needed to rule out alternative explanations.

KEYWORDS

cross-race effect, group status, hierarchy, intergroup relations, own-race effect, recognition memory

BACKGROUND

The Quincy Five. Cornelius Dupree. Malcolm Alexander. These Black American men and many others have been falsely accused by White witnesses of crimes they did not commit. In the United States, nearly a third of wrongful convictions that are later overturned are based on misidentification by someone of a different race (Innocence Project, 20). Such instances of faulty eyewitness identification often reflect the other-race effect (ORE), a recognition memory advantage for one's racial ingroup versus outgroup. First described in the psychological literature more than fifty years ago (Malpass & Kravitz, 27), the ORE has been robustly demonstrated in laboratory experiments, field studies and archival analyses (for meta-analytic reviews, see Meissner & Brigham, 29; Sporer, 48).

Some theories of the ORE emphasize the role of motivation (Hugenberg et al., 19; Meissner et al., 30; Rodin, 42): Because the ingroup is typically more relevant to relationships, belonging and self-esteem than is the outgroup, this relevance differentially motivates people to attend to, and to process more carefully, ingroup versus outgroup members. Inspired by this motivational perspective, the present research examines the effects of group status on memory for faces.

In hierarchical societies, groups with relatively higher status often hold significantly more material and social power than groups with relatively lower status. Thus, to the extent that higher-status group members influence the outcomes of lower-status group members—for example through control of resources and outcomes—lower-status group members may be motivated to carefully attend to higher-status outgroup members. In the present research, we investigated the contributions of status motivations to attend to the ingroup versus outgroups in the context of the ORE. Whereas previous work has often focused on specific ingroups and/or specific outgroups, such as White people's memory for Black people, we instead examine multiple ingroups and outgroups to provide relatively more generalized insight into the role of status motivations in the ORE.

THEORIES OF THE ORE

Most theories that explain the ORE fall into two non-mutually exclusive camps: perceptual expertise models and social cognitive models. Perceptual expertise models assume that people have relatively more experience with same- versus other-race people and, thus, are more skilled at processing and encoding faces of their own race (Rhodes et al., 40; Tanaka et al., 52). Social cognitive models posit that people, by default, categorize other-race faces but individuate same-race faces (Fiske & Neuberg, 15; Levin, 23; Sporer, 48). Whereas categorization relies on the relatively effortless search for cues to group memberships, individuation involves the relatively effortful search for and processing of unique facial characteristics. As the relatively more effortful process, individuation typically requires more motivation than does categorization—which is why individuation is usually reserved for ingroup members. Specifically, the racial ingroup is assumed to be motivationally relevant due to its relational significance: Our outcomes are interdependent with ingroup members, ingroups facilitate a sense of belonging, and ingroups can increase feelings of self-worth (Correll & Park, 8). The differential motivational relevance of the racial ingroup over outgroups is assumed to underpin the ORE (Hugenberg et al., 19; Meissner et al., 30; Rodin, 42; Sporer, 48).

Internal versus external motivations

Though the ORE reflects, in part, the greater motivational relevance of the racial ingroup versus outgroups, a variety of qualitatively distinct motivations can moderate the ORE by changing the relevance of the ingroup and/or outgroup. For example, White participants' recognition of Black people increased when they were instructed to attend to individuating facial features in order to avoid the ORE (Hugenberg et al., 18). Similarly, Latinx participants' recognition of Black people increased when they

were offered financial incentive for accurate responses (Susa et al., 50). In both of these cases, recognition of racial outgroup members was moderated by a motivation that originated external to participants (i.e. to follow experimenter's instructions).

The ORE also can be moderated by motivations that originate internally to participants. For example, White participants better recognized Black people with angry versus neutral expressions (Ackerman et al., 1; Young & Hugenberg, 55). Anger signals threat (Ekman & Friesen, 13) and angry faces capture attention at relatively early stages of processing (Hansen & Hansen, 17). Together, these findings suggest that angry faces activate deeply rooted motivations to attend to threatening stimuli, which, in turn, may explain White participants' increased memory for angry Black faces versus neutral Black faces in prior work (Ackerman et al., 1; Young & Hugenberg, 55). Conversely, middle-class White participants' recognition of White faces decreased when the faces were presented in impoverished versus wealthy backgrounds (Shriver et al., 45). To the extent that impoverished White people are outgroup members to middle-class White participants, the decreased relevance signalled by outgroup categorization reduced participants' motivation to remember those faces. In both of these cases, recognition of ingroup and outgroup members was moderated by motivation that originated internal to participants (i.e. to attend to threats or to the ingroup).

Group status motivation

Another motivation that has received relatively little attention in previous ORE research is social status. Social status refers to the respect or esteem afforded to individuals due to their perceived value (Anderson et al., 3; Magee & Galinsky, 26). Members of higher-status groups often hold power and influence, and people are motivated to attend to those they believe are powerful or whom they depend on (Fiske, 14; Shriver & Hugenberg, 44). Notably, the assumption of outcome dependence underlies the default motivation to attend to the ingroup (Correll & Park, 8). However, in some cases outcomes also depend on outgroups as a function of their status, in particular for members of minoritized, underrepresented, or lower-status groups. Thus, it would be reasonable to expect for members of lower-status groups to sometimes exhibit better memory for higher-status group members. For example, in South Africa essentially all political and economic power was until relatively recently held by White South Africans, and Black South Africans demonstrated a reversed ORE with better recognition of White relative to Black faces (Wright et al., 54). Similarly, in the United States, where White Americans possess most power and wealth, Black Americans sometimes demonstrate a reversed ORE with better recognition of White faces than Black faces (Gross, 16, Pica et al., 36; but see Dodson & Dobolyi, 11, Pauker et al., 34). Other lower-status racial/ethnic groups sometimes demonstrate a reversed ORE, as well, such as East Asians in Canada (Ng et al., 33). In contrast, White people are the higher-status racial group in Western society and consistently demonstrate the ORE across a variety of Western contexts, including America, Canada, Australia, and Germany (Jackiw et al., 21; Malpass & Kravitz, 27; McKone et al., 28; Singmann et al., 47). Taken together, existing literature demonstrates a robust ORE among members of higher-status racial/ethnic groups, but an inconsistent ORE among members of lower-status racial/ethnic groups.

Though ORE theory acknowledges the roles of status (Hugenberg et al., 19), group status is not central to any theoretical perspective, nor is it well-understood as distinct from other, related motivations. For example, returning to middle-class White participants' decreased recognition of White faces presented in impoverished versus rich contexts (Shriver et al., 45), the researchers primarily interpreted these findings in terms of ingroup versus outgroup categorization, reflecting middle-class White participants' '… tendency to categorize White faces in impoverished contexts as *outgroup* members (e.g. 'poor Whites')'. (p. 260, emphasis added). However, they also note that '…an impoverished White person may expect to be recognized poorly by any observer so long as that observer believes them to be in a *devalued* 'lower-class' outgroup'. (p. 272, emphasis added). These two interpretations suggest related but distinct mechanisms for decreased recognition of impoverished White faces. The former account suggests that

outgroup categorization per se decreases recognition. In contrast, the latter account suggests that status determines recognition, such that members of lower-status outgroups will be ignored as irrelevant, but members of higher-status outgroups will be remembered. Moreover, the status account suggests that the ORE reflects motivations that can sometimes work together but sometimes compete (i.e. the motivational relevance of the ingroup for relationships, belonging and self-esteem, versus the motivational relevance of higher-status outgroups for resources and outcomes). Thus, the present research examines the contributions of multiple, qualitatively distinct motivations to the ORE — motivations that can be congruent or competitive.

EXPERIMENT 1

Experiment 1 examined the contributions of distinct motivations to the ORE among Black and White Americans. Participants viewed members of their racial ingroup and a racial outgroup, and we manipulated external motivation by offering financial incentive to remember either members of the ingroup or outgroup. The influence of financial incentive on the ORE has been studied previously, but findings have been inconsistent; sometimes financial incentive reduces the ORE (Susa et al., 50) and other times it does not (Barkowitz & Brigham, 5). We measured participants' internal motivation to endorse status hierarchies in the form of social dominance orientation (SDO; Pratto et al., 38). SDO refers to the degree to which individuals endorse group-based inequality, with people low in SDO valuing egalitarianism and people high in SDO valuing hierarchy maintenance. To our knowledge, SDO has not been examined in the context of the ORE.

We expected White participants to better recognize White faces than Black faces, and Black participants to better recognize Black faces than White faces (i.e. to demonstrate the ORE). Additionally, we expected financial motivation to influence recognition: Participants with financial incentive to remember same-race faces should show a magnified ORE, whereas participants with financial incentive to remember other-race faces should show an attenuated (or reversed) ORE. We also expected hierarchy endorsement to influence recognition: To the extent that high-SDO participants support hierarchy in society, they should pay closer attention to higher-status White faces than to lower-status Black faces and, thus, should better recognize White faces.

In addition to the main effects of group membership, financial incentive and hierarchy endorsement, we also designed Experiment 1 to provide conditions in which motivations were either congruent or competed. We expected participants' recognition advantage for White versus Black faces to be highest when all motivations are congruent, that is, high-SDO White participants with financial incentive for White accuracy. However, our predictions were less straightforward when motivations compete with one another. For example, financial incentive for Black accuracy combined with high SDO might cancel one another out, leaving only group membership to drive responses. Alternately, to the extent that internal motivations are generally stronger than external motivations (Roth et al., 43), the response tendency produced by high SDO (i.e. to attend to White faces) might overwhelm the response tendency produced by financial incentive for Black accuracy. In this case, high SDO would facilitate ingroup recognition for White participants but hinder ingroup recognition for Black participants.

Most ORE research has relied on images of Black and White males as stimuli. However, Black males are more strongly stereotyped as threatening than are White males (Blascovich et al., 6; Correll et al., 9; Miller et al., 31; Payne, 35). The differential threat of Black versus White males is important because perceptions of threat can moderate the ORE, such that Black faces are better remembered when they are perceived as threatening (Ackerman et al., 1; Young & Hugenberg, 55). Consequently, relying on pictures of Black males and White males confounds race with threat. To address this issue, in Experiment 1 we used pictures of Black females and White females—which do not differ in threat stereotypes (Plant et al., 37)—to isolate the role of race in the ORE without the confound of threat.

Hypotheses for this and all experiments (except Experiments 2b and 2c) were pre-registered. All pre-registrations, data and analysis code are available at osf.io/8wu5b. Stimuli and materials for all experiments are available in the Supporting Information.[1]

Method

Design

This experiment had a 2 × 2 × 3 mixed design, with a within-subjects factor of stimulus race (Black, White) and between-subjects factors of participant race (Black, White) and incentive condition (Black stimuli accuracy, White stimuli accuracy, no incentive offered).

Participants

In this and all other experiments reported here, we aimed to recruit at least 100 participants per condition.[2] We recruited participants who reside in the United States (N = 748) through CloudResearch (Litman et al., 24). They were compensated with $4.75 for roughly 30 minutes of participation. Based on pre-registered exclusion criteria, 153 did not pass the attention check (i.e. 'If you are reading this, please select 'Three' from the options below'.) or did not have complete data, and 119 did not pass the manipulation check (i.e. 'I tried to remember the African [European] American faces more'.).[3] This left a final sample of 476 participants. Only participants who self-reported being White only (n = 232, M_{age} = 39.84, SD = 13.08) or Black only (n = 244, M_{age} = 35.89, SD = 10.63) were included in analyses.

Materials, measures and manipulations

Face stimuli

We selected 72 Black and 72 White female faces from the Chicago Face Database (Ma et al., 25) that were rated as most racially prototypical (see Supporting Information).

Social Dominance Orientation

The 16-item SDO scale (Pratto et al., 38) measures the extent to which an individual believes some groups are superior and others are inferior (e.g. 'Some groups of people are simply inferior to other groups'), and that established social hierarchy should be maintained (e.g. 'It's probably a good thing that certain groups are at the top and other groups are at the bottom'). Participants indicated their agreement

[1]Given the nested nature of our experimental paradigm, we pre-registered that we would use multilevel modelling for this line of research. However, upon analysing the data, we found that the intra-class correlations were low enough that multilevel modelling was unnecessary. Consequently, we report in the main text analytic approaches that are more traditionally used in ORE research (i.e. correlation, linear regression). For completeness' sake, we report the multilevel modelling analyses in the Supporting Information. The pattern of results is the same across the different analytic approaches.

[2]Our target of N = 100 per condition is based on an ongoing, parallel line of research in our lab at the Southern California university that relies on an identical learning/recognition paradigm, but different stimuli (Calanchini, 7). Post-hoc power analysis of experiments in that line of research indicated that N = 41 would be sufficient to provide 80% power at α = .05 to detect the observed effects on d'. Given uncertainty about whether the size of the effect would generalize across stimuli, we aimed conservatively and collected samples 2.5× larger than the power analysis suggested, (i.e. N = 100) for all experiments conducted at the Southern California university. Experiments 2b and 2c are exceptions to this, though their samples exceed the minimum sample size recommended by the power analysis.

[3]Significantly more White (n = 61) than Black (n = 35) participants were excluded based on these criteria, $\chi^2(1) = 6.43$, p = .01.Given the unexpectedly high number of exclusions, we re-ran the analysis including all participants and observed the same pattern of significant results as reported in the main text.

with each item on a scale from *strongly disagree/disapprove* (1) to *strongly agree/approve* (7); higher summed scores reflect greater SDO ($\alpha = .94$).

Financial incentive

Participants were randomly assigned to one of three conditions: no financial incentive, Black accuracy incentive or White accuracy incentive. In the financial incentive conditions, participants were encouraged with monetary reward to respond accurately to White faces or Black faces (see Supporting Information).

Procedure

We used a memory task that consisted of learning, filler and recognition tasks (Malpass & Kravitz, 27). Upon providing consent, participants began the learning task with instructions to pay attention to the faces presented because they would be asked about them later. Participants in the Black and White accuracy conditions also received instructions about the monetary reward. All participants then saw 72 faces—36 White and 36 Black—in a random order for 2s each. After the learning task, participants completed the SDO scale and then began the recognition task. Participants were instructed that they would view faces from the first task, along with new faces and to indicate whether they had seen each face previously or not. Following the recognition task, participants completed a set of demographic questions that included an attention check and a manipulation check and were debriefed.

Results

Relying on signal detection theory (Swets et al., 51), all responses were coded as follows. Participants were instructed in the recognition task to indicate whether they had seen each picture previously (yes/no), so a *hit* reflects a 'yes' response to a picture that was presented previously, and a *false alarm* reflects a 'yes' response to a picture that was not presented previously. Signal detection proposes that response accuracy reflects two processes: memory strength and response bias in the absence of memory.[4] Memory strength is operationalized in the *sensitivity* (d') parameter as the difference between (standardized) hits and false alarms. The ORE is typically observed in terms of higher d' for ingroup faces than outgroup faces.

We used multiple regression to assess the influences of internal and external motivations on the ORE. Incentive condition was dummy coded with no incentive as the reference group, and SDO was centred at the mean. A three-way interaction between participant race, stimulus race and incentive condition tested our hypotheses regarding the motivational influence of financial incentive. To examine our hypothesis of SDO as motivation, as well as congruent versus competing motivations, we also included SDO in the interaction. The results of the full model are reported in Table 1.

An effect of stimulus race emerged, such that participants better remembered White than Black faces, $\beta = 1.04$, $p < .001$ (Figure 1). White participants demonstrated the ORE, better recognizing White ($M = 0.98$, $SD = 0.77$) than Black ($M = -0.01$, $SD = 0.35$) faces, $t(231) = 17.95$, $p < .001$, $d = 1.18$. Black participants demonstrated a reversed ORE, better recognizing White ($M = 0.90$, $SD = 0.76$) than Black ($M = 0.01$, $SD = 0.36$) faces, $t(243) = 16.23$, $p < .001$, $d = 1.04$.

None of the interactions among participant race, stimulus race, incentive condition and SDO were reliably different from zero, suggesting that neither financial incentive nor SDO influenced the ORE. Nevertheless, we decomposed the interactions to test our a priori predictions. None of our predictions about financial incentive, SDO and their interaction moderating the ORE were supported, either

[4]Because response bias is not central to our hypotheses, we report response bias analyses for all experiments in the Supporting Information.

TABLE 1 Model of memory strength from participant race, stimulus race, incentive condition and SDO in Experiment 1

Variable	β estimate	Std. error	*t*-Value	*p*-Value
(Intercept)	−0.0599	0.0623	−0.9618	.3364
Participant race	0.0395	0.0861	0.4587	.6465
Black accuracy incentive	0.1091	0.0921	1.1845	.2365
White accuracy incentive	0.0537	0.0973	0.5515	.5814
Stimulus race	1.0437	0.0880	11.8545	.0000***
SDO	0.0013	0.0037	0.3561	.7218
Participant Race × Black Accuracy Incentive	−0.0883	0.1277	−0.6914	.4895
Participant Race × White Accuracy Incentive	0.0388	0.1394	0.2782	.7809
Participant Race × Stimulus Race	−0.0849	0.1218	−0.6971	.4859
Stimulus Race × Black Accuracy Incentive	−0.0969	0.1303	−0.7441	.4570
Stimulus Race × White Accuracy Incentive	−0.1236	0.1376	−0.8980	.3694
Participant Race × SDO	−0.0012	0.0050	−0.2482	.8040
Black Accuracy Incentive × SDO	0.0016	0.0051	0.3058	.7599
White Accuracy Incentive × SDO	−0.0002	0.0060	−0.0363	.9711
Stimulus Race × SDO	−0.0028	0.0052	−0.5374	.5911
Participant Race × Stimulus Race × Black Accuracy Incentive	0.0697	0.1806	0.3858	.6997
Participant Race × Stimulus Race × White Accuracy Incentive	−0.0426	0.1972	−0.2162	.8288
Participant Race × Black Accuracy Incentive × SDO	−0.0039	0.0072	−0.5492	.5830
Participant Race × White Accuracy Incentive × SDO	0.0017	0.0085	0.1958	.8448
Participant Race × Stimulus Race × SDO	0.0089	0.0071	1.2531	.2105
Stimulus Race × Black Accuracy Incentive × SDO	0.0071	0.0072	0.9788	.3279
Stimulus Race × White Accuracy Incentive × SDO	−0.0101	0.0084	−1.1959	.2320
Participant Race × Stimulus Race × Black Accuracy Incentive × SDO	−0.0127	0.0101	−1.2578	.2088
Participant Race × Stimulus Race × White Accuracy Incentive × SDO	0.0168	0.0120	1.4045	.1605

Note: Participant race reflects Black versus White, such that positive values correspond to larger d' for Black participants. Stimulus race reflects White versus Black, such that positive values correspond to larger d' for White stimuli. Black (White) accuracy incentive is compared to no incentive, such that positive values correspond to larger d' for participants in the Black (White) accuracy incentive condition.

***$p < .001$.

descriptively or reliably, for either Black or White participants. For the sake of space, we report these follow-up analyses fully in the Supporting Information.

A surprising number of participants' d' scores were close to zero, suggesting that they could not discern old from new targets. Consequently, we conducted a follow-up exploratory analysis that excluded participants with d' for either Black or White target stimuli that were less than or equal to 0, but this exclusion did not change the pattern of results reported above. We report this analysis in full in the Supporting Information.

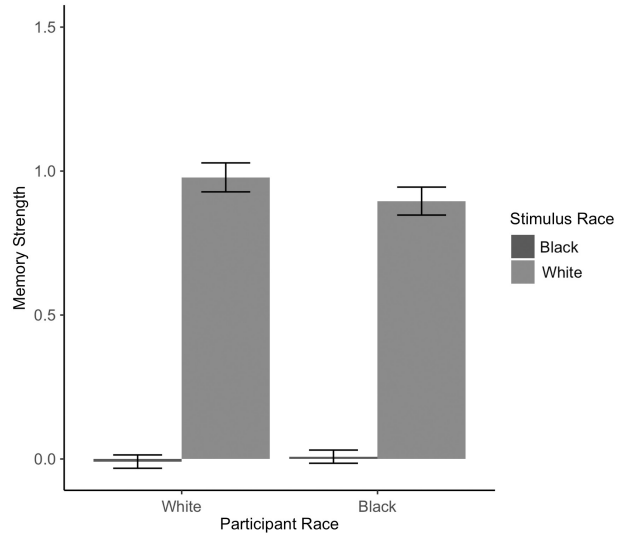

FIGURE 1 Effect of stimulus race on memory strength by participant race in Experiment 1.
Note: Error bars represent standard errors

Discussion

In Experiment 1, we tested the influence of multiple motivations on the ORE, under conditions in which we expected them to produce congruent or competing responses. Contrary to our predictions, neither financial incentive nor hierarchy endorsement moderated the ORE. Group membership also did not moderate the ORE. Instead, Black and White American participants alike better remembered White than Black faces.

White participants' recognition advantage for White versus Black faces in Experiment 1 is perhaps unsurprising, as this pattern of results reflects the typical ORE (Meissner & Brigham, 29). However, Black participants' recognition advantage for White versus Black faces in Experiment 1 is more surprising, given that it reflects a reversed ORE. Most theories of the ORE predict a default recognition advantage for the ingroup over outgroups (Hugenberg et al., 19; Meissner et al., 30; Rodin, 42; Sporer, 48). Previous research sometimes reveals the expected ingroup recognition advantage among Black American participants (Dodson & Dobolyi, 11; Pauker et al., 34), but sometimes reveals an outgroup recognition advantage (Gross, 16; Pica et al., 36), as we found.

To our surprise, neither financial incentive nor hierarchy endorsement moderated the ORE, nor did the assumed default motivation to attend to the ingroup consistently influence responses: White participants demonstrated a memory advantage for the ingroup, but Black participants did not. This pattern of results could be due to non-motivational factors, such as participants having more previous exposure to White than Black faces (Singh et al., 46). That said, the findings that emerged in Experiment 1 also suggest the contribution of a different motivation that has not been considered in previous research: to attend to members of higher-status groups. All participants in Experiment 1 live in the United States, and in American society White people are of normatively higher status than Black people. Status signals importance, outcome dependence, and power, and people pay attention to others who control their outcomes (Fiske, 14; Neuberg & Fiske, 32). Consequently, for White Americans, we would expect the motivational relevance of the ingroup to complement the motivational relevance of the higher-status group (which, in this case, is the ingroup), and both motivations to work in concert to facilitate memory for White versus Black faces. In contrast, for Black Americans, we would expect the motivational relevance of the ingroup to conflict with the motivational relevance of the higher-status group (which, in this case, is the outgroup) and both motivations to produce competing responses.

TABLE 2 Overview of participants and stimuli in Experiments 2a–c

Experiment	Participant sample	Stimulus race
2a	Asian	Black, White
	Latinx	Black, White
2b	Asian	Black, White
2c	Asian	Black, White
	White	Asian, Black

The motivational primacy of the ingroup is central to many theories of the ORE (Hugenberg et al., 19; Meissner et al., 30; Rodin, 42; Sporer, 48). However, if status motivations also influence the ORE, as Experiment 1 may allude to, then status motivations in the absence of ingroup motivations should be sufficient to produce a recognition advantage for members of higher-status groups. Experiments 2a–2c tested this possibility.

EXPERIMENT 2

Experiments 2a–2c investigated whether status motivations—absent ingroup-based motivations—are sufficient to produce a recognition advantage for members of higher-versus lower-status groups. To do so, we designed a series of experiments in which participants completed a recognition memory task consisting of members of two groups that differed in social status. Importantly, neither of the two groups reflected participants' racial/ethnic ingroups. If motivation to attend to the ingroup is the primary motivational driver of the ORE, then participants in Experiments 2a–2c should demonstrate no recognition advantage for either group because neither is the ingroup. However, if status motivations can influence responses as we predict, then participants should demonstrate a recognition advantage for a higher-status outgroup over a lower-status outgroup. We tested this possibility across a variety of racial and ethnic ingroups and outgroups (Table 2).

Method

Design & participants

Experiment 2a

Experiment 2a had a 2 × 2 mixed design, with a within-subject factor of stimulus race (Black, White) and a between-subject factor of participant race (Asian, Latinx). We recruited Asian and Latinx undergraduate student participants from a Southern California university's Psychology online participant pool. The experiment ran for an entire academic term, and by the end of the term we collected responses from $N = 236$ participants. Based on pre-registered exclusion criteria, 37 participants did not pass the attention check or did not have complete data, and 68 were not Asian or Latinx. This left a final sample of 131 participants (Asian $n = 51$, $M_{age} = 19.67$, $SD = 1.26$; Latinx $n = 80$, $M_{age} = 19.77$, $SD = 2.01$).

Experiment 2b

Experiment 2b had a within-subjects design, with participants viewing both Black and White stimuli. We recruited 46 Asian undergraduate students ($M_{age} = 19.06$, $SD = 1.19$) from a Northern California university's Psychology participant pool.

Experiment 2c

Experiment 2c had a mixed design, with a between-subject factor of participant race (Asian, White) and a within-subject factor of stimulus race: Asian participants viewed Black and White faces, and White

participants viewed Asian and Black faces. We recruited 145 Asian and White undergraduate students from a Northern California university's Psychology participant pool. Four participants were eliminated for responding with the same key throughout the recognition task, leaving a total of $N = 141$ participants (Asian $n = 66$, White $n = 75$; $M_{age} = 19.64$, $SD = 3.61$).

Materials, measures and procedure

Experiment 2a

The materials, measures and procedure were identical to Experiment 1 with one exception: There was no manipulation of financial incentive for correct responses to Black or White faces. Participants completed a learning task consisting of Black and White people's faces, the SDO scale, a recognition task, and demographic items.

Experiment 2b

Participants completed the experiment in groups of one to four, each person with their own computer, in laboratories on campus. Experimenter race was not systematically manipulated nor recorded. After giving informed consent, participants completed a memory task similar to the one used in Experiment 2a, with a few differences: (1) the learning task had 10 male faces of each race, (2) participants rated the attractiveness of each face on an eight-point scale during the learning task to ensure that they attended to the stimuli, (3) participants read four news articles unrelated to race between the learning and recognition tasks, and (4) the recognition task had 20 faces of each race. After the memory task, they answered perceived race status questions. Finally, they reported demographic information and were debriefed.[5]

Face stimuli

Images of 40 male faces (20 Black and 20 White) were generated using FacesID (https://faces-id.com/index.html; see Supporting Information), a program for creating forensic sketches. We generated White and Black faces based on facial feature settings in the program that are characteristic of each racial group.

Perceived race status

Participants answered two questions pertaining to White and Black status on a scale from 0 to 100: 'How powerful are Whites (Blacks) as a group?' and 'What status do Whites (Blacks) have as a group?' Scores on the two status items were averaged, so that each participant had an average White status score ($r = .79$) and Black status score ($r = .45$).

Experiment 2c

The materials, measures and procedure were largely identical to Experiment 2b, with the addition of Asian stimuli generated with FacesID. Participants completed the experiments in same-race groups of one to three by same-race experimenters. Asian participants completed a White/Black memory task, and White participants completed an Asian/Black memory task.

Perceived race status

Asian participants answered two questions about White and Black status on a scale from 1 to 7: 'How powerful are Whites (Blacks) as a group?' and 'What status do Whites (Blacks) have as a group?' Scores

[5]Participants in Experiments 2b and 2c also completed an Implicit Association Test and measures assessing intergroup contact. In Experiments 2b and 2c Asian participants' implicit bias in favour of White versus Black people positively predicted better memory for White than Black faces, but in Experiment 2c White participants' implicit bias in favour of Asian versus Black people was unrelated to their memory for Asian versus Black people. In both experiments, self-reported contact with both outgroups did not predict differences in recognition memory.

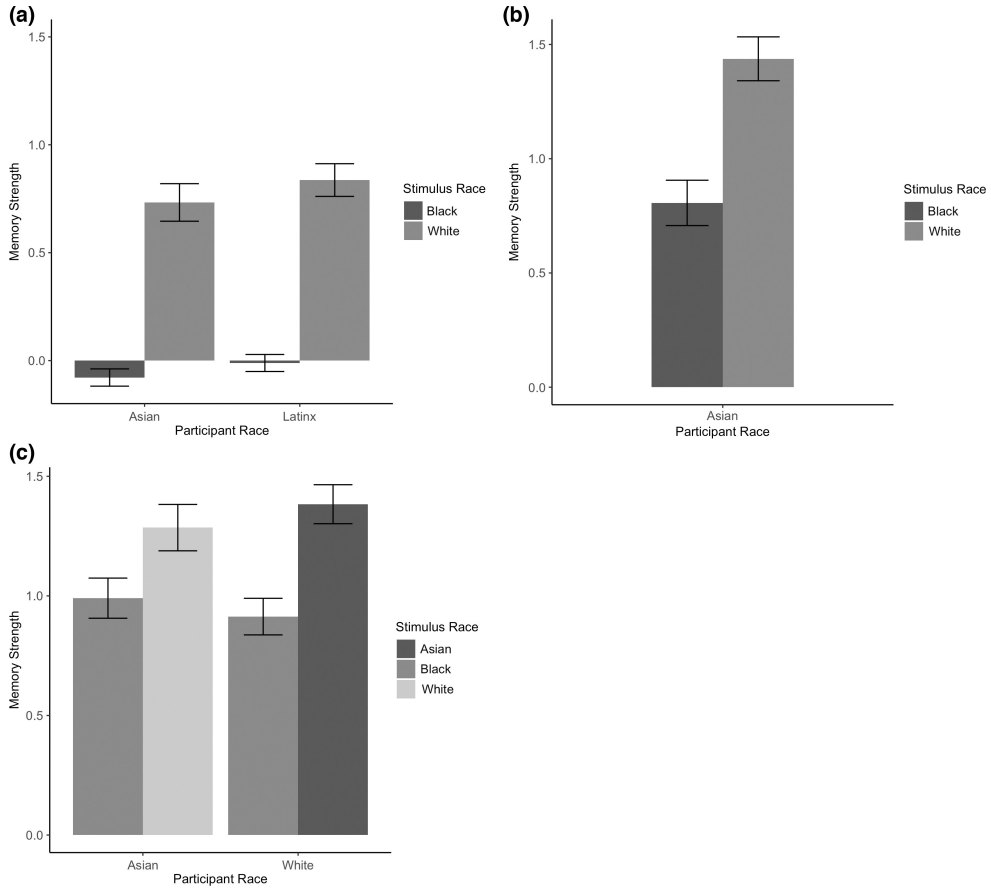

FIGURE 2 Effect of stimulus race on memory strength in Experiments 2a–2c. *Note*: Left, right and bottom panels reflect Experiment 2a, 2b and 2c results, respectively. Error bars represent standard errors

on the two status items were averaged, so that each participant had an average White status score ($r = .59$) and Black status score ($r = .60$).

White participants answered the same two questions, but about Asian and Black status. Scores on the two status items were averaged, so that each participant had an average Asian status score ($r = .60$) and Black status score ($r = .51$).

Results

Experiment 2a

Two paired sample *t*-tests revealed that Asian participants better recognized White ($M = 0.73$, $SD = 0.62$) than Black ($M = -0.08$, $SD = 0.29$) faces, $t(50) = 8.38$, $p < .001$, $d = 1.17$ and Latinx participants better recognized White ($M = 0.84$, $SD = 0.68$) than Black ($M = -0.01$, $SD = 0.35$) faces, $t(79) = 9.90$, $p < .001$, $d = 1.11$ (Figure 2).

To test our main hypothesis that status could influence face recognition, we created a memory strength difference score, operationalized as White d' − Black d' (Asian participants: $M = 0.81$, $SD = 0.69$; Latinx participants: $M = 0.85$, $SD = 0.77$), such that larger values indicated greater memory strength for White than Black faces. Next, we correlated the memory strength difference score with

SDO (Asian participants: $M = 35.90$, $SD = 14.62$; Latinx participants: $M = 27.65$, $SD = 9.75$). There was no relationship between SDO and the difference in memory strength for White and Black target stimuli for either Asian participants, $r = -.10$, $p = .48$ or for Latinx participants, $r = .08$, $p = 51$.

Because a surprising number of participants' d' scores were closer to zero, we conducted a follow-up exploratory analysis that excluded participants with d' for either target stimuli that was less than or equal to 0. This exclusion did not change the pattern of results reported above, so we report this analysis in full in the Supporting Information.

Experiment 2b

A paired sample t-test revealed that Asian participants better recognized White ($M = 1.44$, $SD = 0.65$) than Black ($M = 0.81$, $SD = 0.67$) faces, $t(45) = 5.79$, $p < .001$, $d = 0.85$ (Figure 2). They also perceived White people ($M = 78.32$, $SD = 15.30$) as higher status than Black people ($M = 51.26$, $SD = 15.26$), $t(45) = 7.89$, $p < .001$, $d = 1.16$.

To test our main hypothesis that status could influence face recognition, we created a memory strength difference score, operationalized as White d' − Black d' ($M = 0.63$, $SD = 0.74$) and a status rating difference score, operationalized as White status − Black status ($M = 27.05$, $SD = 23.26$). There was no relationship between the memory strength and status difference scores, $r = -.24$, $p = .11$.

To be consistent with how we analysed the data in previous experiments, we conducted a follow-up exploratory analysis that excluded participants with d' for either target stimuli that was less than or equal to 0. This exclusion did not change the pattern of results reported above, so we report this analysis in full in the Supporting Information.

Experiment 2c

Two paired sample t-tests revealed that Asian participants better recognized White ($M = 1.29$, $SD = 0.79$) than Black ($M = 0.99$, $SD = 0.68$) faces, $t(65) = 2.82$, $p = .006$, $d = 0.35$ and White participants better recognized Asian ($M = 1.38$, $SD = .71$) than Black ($M = 0.91$, $SD = 0.66$) faces, $t(74) = 5.11$, $p < .001$, $d = 0.59$ (Figure 2). Asian participants perceived White people ($M = 5.90$, $SD = 1.12$) as higher status than Black people ($M = 3.90$, $SD = 1.01$), $t(65) = 10.59$, $p < .001$, $d = 1.30$, and White participants perceived Asian people ($M = 4.57$, $SD = 1.04$) as higher status than Black people ($M = 4.11$, $SD = 1.10$), $t(74) = 3.02$, $p = .003$, $d = 0.35$.

To test our main hypothesis that status could influence face recognition, we combined the Asian and White samples. We recoded the target stimuli as 'high status' (i.e. Asian or White) and 'low status' (i.e. Black), then created a memory strength difference score, operationalized as high status d' − low status d' ($M = 0.39$, $SD = 0.82$) and a status rating difference score, operationalized as high status - low status ($M = 1.18$, $SD = 1.61$). There was a marginal negative relationship between the memory strength and status difference scores, $r = -.16$, $p = .06$.

To be consistent with how we analysed the data in previous experiments, we conducted a follow-up exploratory analysis that excluded participants with d' for either target stimuli that was less than or equal to 0. This exclusion did not change the pattern of results reported above, so we report this analysis in full in the Supporting Information.

Discussion

In Experiments 2a–2c, participants from a variety of ethnic and racial groups consistently demonstrated a recognition advantage for members of normatively higher- versus lower-status racial outgroups. Asian

and Latinx American participants better recognized White than Black faces, and White American participants better recognized Asian than Black faces. That said, an alternative explanation for this pattern of results is that Asian and Latinx American participants have more exposure to White than Black faces, and White American participants have more exposure to Asian than Black faces. However, none of our self-report measures of either perceived status or contact were reliably related to memory differences for the two outgroups. Nevertheless, Experiments 2a–2c demonstrate that a recognition advantage can emerge for normatively higher-status outgroups.

Experiments 2a–2c extend previous ORE research by demonstrating that ingroup-relevant motivations are not necessary to produce a consistent recognition advantage for higher-versus lower-status group members. However, ingroups are crucial to traditional conceptualizations of the ORE. Consequently, in Experiment 3 we returned to the traditional ingroup/outgroup template, but manipulated outgroup status. Specifically, participants in Experiment 3 completed a memory task consisting of faces from three racial/ethnic groups: the ingroup, a higher-status outgroup, and an outgroup of equal status. Additionally, Experiment 3 aimed to shore up a point of procedural inconsistency across Experiments 1–2. We relied solely on female faces in Experiments 1 and 2a because Black and White males differ in terms of both racial group membership and in terms of threat stereotypes. However, the same pattern of results emerged in Experiments 2b and 2c, which relied solely on male faces. In Experiment 3, we tested the role of target gender in the ORE directly by manipulating whether participants viewed pictures of males or females. In doing so, we are better positioned to distinguish the contributions of racial ingroup and status motivations from the contributions of race and gender stereotypes to the ORE.

EXPERIMENT 3

In Experiment 3, Black American participants completed a memory task consisting of White, Black and Latinx faces. Given the high-status recognition advantage suggested by Experiments 1 and 2, we predicted that Black participants would demonstrate a memory advantage for White versus Black faces because White Americans are normatively higher-status than Black Americans (Kahn et al., 22). However, because Black Americans perceive Black and Latinx racial/ethnic groups to be of equivalent status (Kahn et al., 22), we predicted that Black participants would not demonstrate a memory advantage for Latinx versus Black faces. That said, we did not make a strong prediction about whether Black participants would show a Black recognition advantage (i.e. the ORE) or no recognition advantage for Black versus Latinx faces.

Method

Design

This experiment had a 3 × 2 mixed design, with a within-subject factor of stimulus race/ethnicity (Black, Latinx, White) and a between-subject factor of stimulus gender (female, male).

Participants

We recruited 238 Black participants from CloudResearch. Based on pre-registered exclusion criteria, 38 did not have complete data or did not pass the quality control and attention checks, and 18 did not identify as only Black. This left a final sample of 182 participants (M_{age} = 35.86, SD = 10.14).

TABLE 3 Model of memory strength from stimulus race, stimulus gender and SDO in Experiment 3

Variable	β estimate	Std. error	*t*-Value	*p*-Value
(Intercept)	0.3850	0.0509	7.5693	.0000***
Latinx Stimulus	−0.1417	0.0719	−1.9692	.0494*
White Stimulus	−0.0075	0.0719	−0.1038	.9173
SDO	0.0060	0.0045	1.3359	.1822
Stimulus Gender	−0.0867	0.0723	−1.1980	.2315
Latinx Stimulus × SDO	0.0042	0.0063	0.6656	.5060
White Stimulus × SDO	0.0059	0.0063	0.9373	.3490
Latinx Stimulus × Stimulus Gender	0.0357	0.1023	0.3490	.7272
White Stimulus × Stimulus Gender	0.1628	0.1023	1.5916	.1121
SDO × Stimulus Gender	−0.0012	0.0065	−0.1868	.8519
Latinx Stimulus × SDO × Stimulus Gender	−0.0148	0.0091	−1.6251	.1047
White Stimulus × SDO × Stimulus Gender	−0.0057	0.0091	−0.6197	.5357

Note: Stimulus gender reflects female versus male, such that negative values correspond to smaller *d'* for male faces.
***$p < .001$.; *$p < .05$.

Materials, measures and procedure

The procedure was nearly identical to Experiment 2a, with a few differences: participants were randomly assigned to view female or male faces; the learning task had 24 faces of each race/ethnicity; and the recognition task had 48 faces of each race/ethnicity.

Face stimuli

Participants viewed faces generated by an artificial intelligence algorithm (https://generated.photos; see Supporting Information). We collected a total of 288 Black, White and Latinx faces first using filtering options available on the website (i.e. viewing only faces categorized by the algorithm as Black, White or Latinx) and then selected faces based on perceived racial prototypicality (144 female and 144 male, 48 of each race). Research assistants blind to the purpose of the experiment further reviewed the stimuli for realism, and faces that were not deemed realistic were excluded prior to data collection.

Social dominance orientation

The SDO measure was identical to the one used in Experiment 1.

Results

We used multiple regression to assess the influence of stimulus race, stimulus gender, and SDO on the ORE. Stimulus race was dummy coded with Black as the reference group, and SDO was centred at the mean. The results of the full model are reported in Table 3.

Stimulus race was related to memory strength, such that Black participants better recognized Black ($M = 0.34$, $SD = 0.48$) than Latinx ($M = 0.22$, $SD = 0.47$) faces, $\beta = -0.14$, $p = .05$ (Figure 3). Participants also better recognized White ($M = .42$, $SD = .53$) than Latinx faces, $t(181) = 4.34$, $p < .001$, $d = 0.32$. However, Black participants recognition for White faces did not differ from their recognition for Black faces, $\beta = -0.01$, $p = .92$. The effects of stimulus gender and SDO, as well as the interactions between the variables, were not reliably different from zero.

To be consistent with how we analysed the data in previous experiments, we conducted a follow-up exploratory analysis that excluded participants with *d'* for any target stimuli that was less than or equal

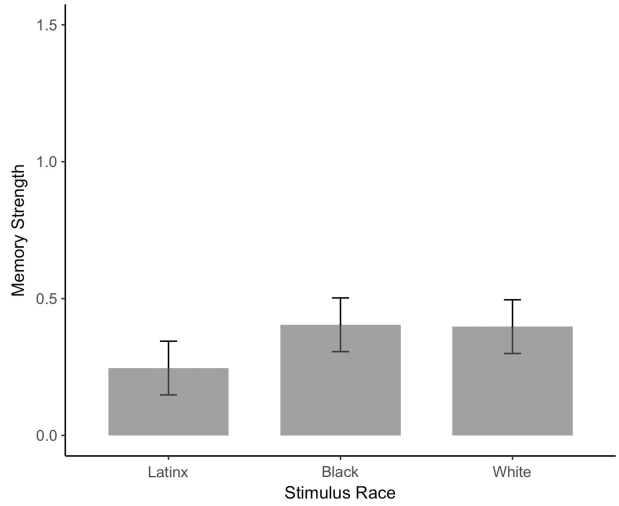

FIGURE 3 Effect of stimulus race on memory strength in Experiment 3. *Note*: Error bars represent standard errors

TABLE 4 Model of memory strength from stimulus race, stimulus gender and SDO in Experiment 3 (excluding participants with d' less than or equal to 0)

Variable	β estimate	Std. error	*t*-Value	*p*-Value
(Intercept)	0.6459	0.0641	10.0697	.0000***
Latinx Stimulus	−0.1106	0.0907	−1.2187	.2244
White Stimulus	0.1241	0.0907	1.3680	.1729
SDO	0.0133	0.0052	2.5513	.0115*
Stimulus Gender	−0.0701	0.0864	−0.8115	.4181
Latinx Stimulus × SDO	−0.0001	0.0074	−0.0142	.9887
White Stimulus × SDO	0.0006	0.0074	0.0763	.9393
Latinx Stimulus × Stimulus Gender	−0.0364	0.1221	−0.2980	.7660
White Stimulus × Stimulus Gender	−0.0312	0.1221	−0.2551	.7989
SDO × Stimulus Gender	−0.0208	0.0076	−2.7360	.0068**
Latinx Stimulus × SDO × Stimulus Gender	0.0057	0.0108	0.5306	.5963
White Stimulus × SDO × Stimulus Gender	0.0153	0.0108	1.4205	.1571

Note: Stimulus gender reflects female versus male, such that negative values correspond to smaller d' for male faces.
***$p < .001$.; **$p < .01$.; *$p < .05$.

to 0. This exclusion criterion changed the pattern of results, so we report the results of this model in Table 4. SDO was positively related to memory strength, $\beta = 0.01$, $p = .01$. Additionally, SDO interacted with stimulus gender to predict memory strength, $\beta = -0.02$, $p = .01$, such that participants higher in SDO had better memory for female than male stimuli (Figure 4).

Discussion

Conceptually replicating Experiments 2, Black participants in Experiment 3 demonstrated a recognition advantage for the normatively higher-status of two outgroups, in that they better recognized White versus Latinx faces. At the same time, Black participants demonstrated the ORE, better recognizing

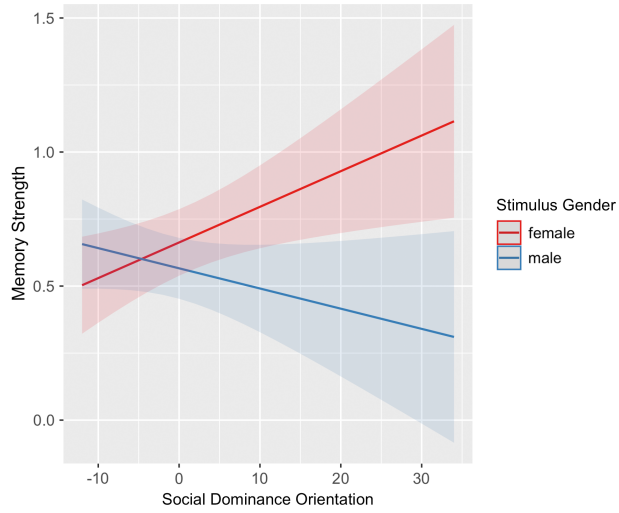

FIGURE 4 Interaction between social dominance orientation and stimulus gender in Experiment 3.
Note: The mean of SDO is centered at 0

members of their racial ingroup versus an outgroup that is of relatively equivalent status (i.e. Latinx). In contrast to Experiment 1, Black participants' memory in Experiment 3 was not different for the ingroup versus the higher-status outgroup (i.e. White). Additionally, and in contrast to Experiments 1 and 2, this pattern of results did not survive follow-up robustness checks, so we interpret them cautiously.

In Experiments 1–3, we manipulated group status by presenting participants with members of groups that vary in perceived social status, and observed better memory for members of higher-versus lower-status groups. That said, Experiment 3 cannot rule out the possibility that Black participants' responses reflect the simultaneous exposure to White majority-group members and predominantly Black social circles. Nevertheless, the pattern of results observed across experiments suggests a role of status in this pattern of recognition. Because our status measures have not reliably moderated the recognition advantage thus far, in Experiment 4 we included three new status measures to further test the predict that differences in perceived status moderate the ORE.

EXPERIMENT 4

The pattern of results reflected in Experiments 1–3 alludes to the possibility of a recognition advantage for members of higher-status groups over lower-status groups. We contend that status signals material and social power, which, consequently, motivates participants to attend more carefully to members of higher- than lower-status groups. To test this assumption, Black American participants in Experiment 4 completed a memory task with Black and White faces, and also reported their perceptions of Black and White people's status in American society. We made three complementary predictions. First, based on the potential high-status recognition advantage we have observed in the present research, we expected Black Americans to better recognize White than Black faces. Second, replicating previous research (Kahn et al., 22), we expected Black Americans to perceive White people to be of higher status than Black people. Third, and most importantly, we expected the magnitude of the difference between perceived White and Black status to moderate the magnitude of the recognition advantage for White versus Black people, such that participants who perceive the greatest difference between White and Black status will have the largest recognition advantage.

Method

Design

This experiment had a repeated measures design, with stimulus race (Black, White) and status measure (Black, White) as within-subject variables.

Participants

A total of 126 Black American adults were recruited from CloudResearch. Based on pre-registered exclusion criteria, 29 did not have complete data or pass the quality control and attention checks, and 9 did not identify as only Black. This left a final sample of 88 participants (M_{age} = 33.80, SD = 11.53).

Materials and measures

Face stimuli
The stimuli used were identical to those used in Experiment 1.

Perceived race status
Participants completed three measures of perceived status. The first was the MacArthur Scale of Subjective Social Status (Adler et al., 2). This measure consists of a picture of a ladder, and each rung's height corresponds to social status, such that higher rungs reflect groups that are better off in terms of money, education and respected jobs (see Supporting Information). Participants were instructed to indicate where Whites/Caucasian-Americans and, separately, where Blacks/African–Americans should be placed on the ladder.

The second measure of perceived status consisted of six pictures each of Black and White female faces. These faces were taken from the CFD and were not the same faces as we used in the learning/recognition task, but did not differ from the faces in the learning/recognition task in racial prototypicality. Participants rated each exemplar face on eight status-related traits (i.e. wealthy, intelligent, high-status, dominant, powerful, attractive, employable, educated; White exemplars α = .96, Black exemplars α = .97). The third measure was identical to the second, except participants rated the eight traits as they applied to 'Black American' and 'White American' categories broadly (White American α = .89, Black American α = .89).

Correlations among the three status measures ranged from small to not reliably different from zero: MacArthur Scale status and exemplar status, r = .04, p = .69; MacArthur Scale status and racial category status, r = .33, p = .002; exemplar status and racial category status, r = .36, p = .001.

Procedure

After giving informed consent, participants completed a memory task similar to the one used in Experiment 1, with one difference: instead of completing the SDO scale between learning and recognition, participants read a short passage about how Cheerios are made and answered three questions assessing their retention of information from the passage. After the memory task, participants completed the perceived race status measures. Finally, they provided demographic information and were debriefed.

Results

A paired sample *t*-test revealed that Black participants better recognized White ($M = 0.87$, $SD = 0.65$) than Black ($M = 0.01$, $SD = 0.35$) faces, $t(87) = 11.35$, $p < .001$, $d = 1.21$.

To test our hypothesis that differences in perceived racial status moderate memory for White versus Black faces, we created a memory strength difference score, operationalized as White d' − Black d' and status rating difference scores for each measure of perceived status, operationalized as White status − Black status. We found no relationship between memory strength ($M = 0.86$, $SD = 0.71$) and MacArthur Scale status ($M = 3.48$, $SD = 2.67$), $r = -.02$, $p = .87$; between memory strength and exemplar status, ($M = -0.19$, $SD = 0.97$), $r = .02$, $p = .87$; or between memory strength and racial category status, ($M = 0.51$, $SD = 2.24$), $r = .05$, $p = 65$.

Because a surprising number of participants' d' scores were close to zero, we conducted a follow-up exploratory analysis that excluded participants with d' for either target stimuli that was less than or equal to 0. This exclusion changed some of the results, so we report them in full here. Replicating the full analysis, a paired sample *t*-test revealed that Black participants better recognized White ($M = 0.95$, $SD = 0.59$) than Black ($M = 0.30$, $SD = 0.18$) faces, $t(41) = 7.13$, $p < .001$, $d = 1.10$. Also replicating the full analysis, the correlation between MacArthur Scale status and exemplar status was not reliably different from zero, $r = -.02$, $p = .90$; however, the correlation between MacArthur Scale status and racial category status was reliable and of small magnitude, $r = .28$, $p = .07$; and the correlation between exemplar status and racial category status was of small magnitude, $r = .32$, $p = .04$.

However, in contrast to the main analysis, we found reliable relationships between memory strength and two of the three status measures. Specifically, memory strength ($M = 0.65$, $SD = 0.59$) correlated negatively with MacArthur Scale status ($M = 2.69$, $SD = 2.70$), $r = -.31$, $p = .05$, but correlated positively with exemplar status, ($M = -0.15$, $SD = 0.90$), $r = .38$, $p = .01$. However, we found no relationship between memory strength and racial category status ($M = -0.12$, $SD = 2.06$), $r = .05$, $p = .77$.

Discussion

Among participants with memory performance above chance, greater recognition for White faces was associated with higher status-related trait ratings for White than Black exemplars, supporting our status-as-motivation hypothesis. However, there was an inconsistent relationship with memory strength across status measures. We interpret these findings as preliminary, yet inconclusive, evidence for status motivation as an influence on the ORE.

META-ANALYSIS

Across all six studies reported in this manuscript, a consistent pattern of results emerged, such that participants' memory was better for members of normatively higher-versus lower-status groups. To quantify and consolidate these findings, we meta-analysed the high-status recognition effect within each participant sample in each experiment (Figure 5). This meta-analysis revealed a large effect of status, with Cohen's $d = 0.76$ [0.67, 0.84] for the fixed effect model and Cohen's $d = 0.84$ [0.53, 1.14] for the random effects model, indicating that participants' memory is reliably larger for members of higher-versus lower-status groups. To be consistent with how we analysed the data throughout this manuscript, we also ran this meta-analysis excluding participants with d' for any target stimuli that was less than or equal to 0. This re-analysis revealed a meta-analytic effect size of Cohen's $d = 0.72$, 95% CI = [0.60, 0.84] for the fixed effect model and $d = 0.78$, 95% CI = [0.54, 1.02] for the random effects model. We report the details of these analyses in the Supporting Information.

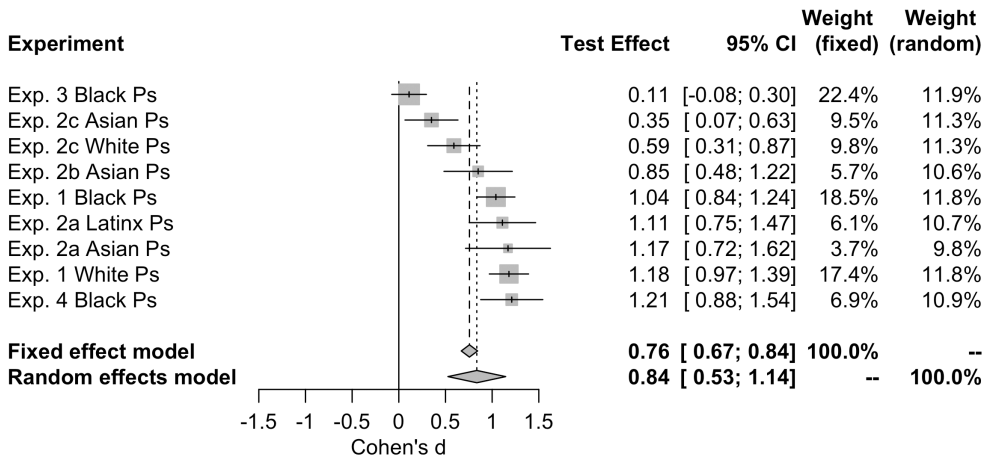

FIGURE 5 Meta-analysis of experiments. *Note*: Meta-analysis of recognition advantage for members of high- versus low-status groups, by participant sample and experiment

GENERAL DISCUSSION

The motivation to attend to the ingroup is central to many theoretical perspectives on the ORE (Hugenberg et al., 19; Meissner et al., 30; Rodin, 42; Sporer, 48). Because ingroups provide self-esteem, belonging and relationships, people are assumed to attend to ingroup members more carefully than outgroup members by default. However, in hierarchical societies, groups vary in the extent to which they hold social power and control resources. Consequently, in the present research we tested whether intergroup recognition varied as a function of group status. Across racial/ethnic groups, stimulus sets, experimental paradigms, and participant populations, American participants consistently appeared to demonstrate a recognition advantage for members of higher-status groups versus lower-status groups. This higher-status recognition advantage reflected a large meta-analytic effect, persisted in the absence of ingroup motivations, and disappeared when group status differences were held constant. However, and contrary to our predictions, measures of perceived group status generally did not moderate this high-status recognition advantage. Further, in our focus on motivational influences on the ORE, the present research cannot conclusively rule out alternative explanations for the observed pattern of results, such as differences in exposure to various racial groups (though see our discussion of contact and expertise, below).

Group status and the ORE

We attend to others as a function of their relevance to our outcomes (Baldwin et al., 4). This relationship between attention and outcome dependence is at the heart of the assumption of ingroup relevance that is central to many theories of the ORE (Hugenberg et al., 19; Meissner et al., 30; Rodin, 42; Sporer, 48). We contend that status is relevant for the same reasons that the ingroup is relevant: Members of higher-status groups have material and social power and, thus, affect the outcomes of members of other groups (Neuberg & Fiske, 32; Ratcliff et al., 39). White people are perceived to be a high-status group in the United States (Dupree et al., 12; Kahn et al., 22), and Asian, Black, and Latinx American participants in the present research better recognized White faces than faces from lower-status racial groups. This pattern of results persisted even when the participant's ingroup was not reflected in the recognition task, indicating that status could be sufficient to produce a memory advantage in favour of the higher-status group.

Though the present research highlights the role of status in recognition memory, status is certainly not the only factor that can account for this pattern of results. An alternative explanation is that White

faces are more memorable or easily distinguishable than are the faces of other racial/ethnic groups. However, White participants better recognized Asian than Black faces, which illustrates a recognition advantage for the higher-status of two outgroups (Kahn et al., 22) and suggests that our pattern of results do not reflect an idiosyncrasy of White faces. Moreover, this pattern of results adds an important nuance to our claim about status-based relevance. In America, Asian people generally have more status in terms of material and social power than do Black people and, consequently, Asian people are more relevant to White people than are Black people—even though both groups are lower status than White people.

We have framed status as a motivation that influences the ORE, and varied experimental stimuli across experiments (i.e. pictures of Asian, Black, Latinx, and White people) in ways that are consistent with our status hypothesis. However, our attempts to measure status motivations as moderators of the ORE were generally unsuccessful. Status only moderated ORE in the predicted direction in Experiment 4, and only in exploratory analysis based on status ratings of specific Black and White exemplars. Importantly, this exemplar-based measure is qualitatively different from the other status measures we used in the present research, which all rely on group-level assessments of status. Though the ORE is generally conceptualized as an intergroup process, it is always measured in terms of memory for individual exemplars. Indeed, we developed this exemplar-based status measure expressly to close this conceptual gap between levels of analysis in how we measured both status and the ORE. That said, it would be disingenuous on our part to distance ourselves from the other, group-level measures of status that we used in this research: We included them because we considered them to be face-valid measures of status, and expected them to moderate the ORE. Nevertheless, we believe that aligning levels of analysis between measures of ORE and measures of status may be a fruitful template for future research. Moreover, we believe that a conservative interpretation of our findings is that the pattern of results demonstrates a consistent recognition advantage for higher-status group members, with initial (but certainly not conclusive) evidence for the motivational role of group status in this recognition advantage.

Outgroup contact and perceptual expertise

We have interpreted the high-status recognition advantage that emerged in the present research primarily in terms of motivational influences. However, many theories of the ORE posit the primacy of perceptual influences (Rhodes et al., 40; Tanaka et al., 52). These theories converge on the assumption that differential exposure to members of the ingroup versus outgroup builds perceptual expertise that facilitates the processing of ingroup faces over outgroup faces. Consequently, a reasonable alternative explanation for the high-status recognition advantage is that our participants have learned to better recognize high- than low-status faces through more exposure to members of high- than low-status groups. This prediction would seem to be face-valid: All of our participants were located in the United States, where White people are the numerical majority (U.S. Census Bureau, 53). To examine this potential mechanism, we re-analysed data from Experiments 1, 2a and 4 and used participants' IP addresses to look up their cities of residence, operationalizing exposure to outgroup members in terms of participants' local racial demographics. In short, we did not find that outgroup exposure moderated the high-status recognition advantage. We report these contact findings in full in another manuscript in this special issue focused specifically on the role of outgroup contact in the ORE (Stelter et al., 49). Though IP addresses are certainly not a perfect proxy for outgroup contact, we found the same pattern of (null) results across a variety of objective (e.g. GPS tracking) and self-report operationalizations of contact.

Financial motivations

Though we have framed this research primarily in terms of status motivations, previous research has demonstrated that a variety of external (Hugenberg et al., 18; Susa et al., 50) and internal (Ackerman

et al., 1; Shriver et al., 45; Young & Hugenberg, 55) motivations can influence the ORE. Building on previous work, in Experiment 1 we manipulated motivation in the form of financial incentive to remember members of the ingroup or outgroup. To our surprise, financial incentive did not moderate the ORE for either White or Black people. That said, the effects of financial incentive in previous ORE research have been inconsistent, with monetary reward moderating the ORE in some cases (Susa et al., 50) but not others (Barkowitz & Brigham, 5). Nevertheless, we expected financial incentive to be especially influential to our paid online participants, who are expressly participating in research for financial gain. Given that previous research has demonstrated that instructions alone—absent financial incentive—are sufficient to moderate the ORE (Hugenberg et al., 18; Rhodes et al., 41; Young & Hugenberg, 55), we can draw no firm conclusions about why financial incentive did not moderate the ORE in the present research. Future research should continue to investigate the role of financial motivations in the ORE.

Limitations

One primary limitation of the present research is that status was not manipulated, and manipulated variables always bolster causal claims. Previous research has manipulated the status of racial ingroup members and may provide a fruitful template for future research in this domain. Building on the paradigm used by Shriver et al. (45), middle-class Black participants could view pictures of Black target faces depicted in contexts that signal high (e.g. mansion), middle (e.g. college) or low status (e.g. prison). If outgroup categorization per se reduces recognition, then middle-class Black participants should recognize Black target faces best in middle-class contexts and equally poorly in high- and low-status contexts. However, if high status signals relevance and power (as we contend in the present research), then middle-class Black participants should recognize Black target faces depicted in high-status contexts better than those depicted in low-status contexts. Future research should investigate these possibilities.

Though the high-status recognition advantage tentatively identified in the present research replicated across racial/ethnic groups, stimulus sets, experimental paradigms, and participant populations, the generalizability of these findings is limited because all experiments took place in America. Income inequality is high in America (Credit Suisse Research Institute, 10)—with White people disproportionately controlling wealth—so our finding of a White recognition advantage among members of other American racial/ethnic groups is perhaps unsurprising. Future research should investigate whether the potential higher-status recognition advantage demonstrated in the present research persists in more egalitarian contexts, where there is not such a pronounced status differential between racial/ethnic groups.

Another limitation of the present research is our reliance on the same paradigm across experiments, which consists of a learning task followed by a recognition task using the same face stimuli. This paradigm has been used in ORE research for decades, but it certainly does not capture the full breadth of nuance in recognition memory. Though we varied a number of procedural details between experiments (e.g. stimuli, stimulus presentation times, number of stimuli), future research should continue to assess the generalizability of these findings using other paradigms, such as ones that modify characteristics of the stimuli themselves (McKone et al., 28).

Finally, the present work is limited in the relatively large proportion of participants who were unable to discern old from new target stimuli, as indicated by d' scores at or below 0. Such low d' scores may suggest that participants were guessing, not following task instructions or otherwise behaving in ways that threaten the validity of their data. To check the robustness of our findings, we re-ran all analyses excluding these participants, which we report in the main text. That said, participants who were unable to discern old from new target stimuli only did so in the context of Black faces. If participants were failing to properly engage with the task, then we should expect them to also have low d' scores for White target stimuli. However, across all experiments Black and White participants alike reliably distinguished

old from new White faces. Thus, the apparent lack of memory strength demonstrated by some of our participants appears to be systematic rather than random and warrants further investigation.

CONCLUSION

The present research demonstrates what appears to be a recognition advantage for members of higher-status groups, but more work is needed to link this pattern of results with its assumed motivational mechanism. Motivations to attend to the ingroup play a prominent role in current ORE literature, but the role of status motivations are much less clear. This work sheds light on the boundary conditions of the ORE and highlights the importance of status among those who lack it.

AUTHOR CONTRIBUTIONS

Deja Simon: Data curation; formal analysis; project administration; visualization; writing – original draft; writing – review and editing. **Jacqueline M. Chen:** Data curation; writing – original draft; writing – review and editing. **Jeffrey W. Sherman:** Conceptualization; data curation; funding acquisition; project administration; writing – original draft; writing – review and editing. **Jimmy Calanchini:** Conceptualization; data curation; funding acquisition; project administration; supervision; writing – original draft; writing – review and editing.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in Open Science Framework at osf.io/8wu5b.

OPEN RESEARCH BADGES

This article has earned Open Data, Open Materials and Preregistered Research Design badges. Data, materials and the preregistered design and analysis plan are available at https://osf.io/8wu5b

ORCID

Deja Simon https://orcid.org/0000-0002-9301-4406
Jimmy Calanchini https://orcid.org/0000-0003-1959-143X

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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