



## Reports

# When under threat, we all look the same: Distinctiveness threat induces ingroup homogeneity in face memory<sup>☆</sup>

John Paul Wilson<sup>\*</sup>, Kurt Hugenberg

Miami University, USA

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## ABSTRACT

The current research investigated the well-established outgroup homogeneity effect in face memory (worse recognition for outgroup faces than ingroup faces). Because past research has shown that group distinctiveness threat can enhance *ingroup* homogeneity, of interest in the current research was whether distinctiveness threat affects face recognition. Across two studies, we found that threatening White American participants' ethnic distinctiveness led to a reduction in same-race face recognition. In other words, distinctiveness threat created ingroup homogeneity in face memory. In both studies, distinctiveness threat led Whites' same-race recognition to drop to cross-race levels. Implications were discussed in terms of how the structure of intergroup relations may drive intergroup differences in face memory.

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The ability to recognize others' faces is a skill central to social cognition (e.g., Bruce & Young, 1986; Byrne, 2000; Zebrowitz, 1997) and is highly adaptive in forging and maintaining functional social relationships (Hefter, Manoach, & Barton, 2005; Kracke, 1994). Despite this, face recognition is often problematic, with multiple social factors biasing face perception and memory (Hugenberg & Sacco, 2008). The cross-race recognition deficit, known more simply as the Cross Race Effect (CRE), is one of these well known biases. Explained simply, the CRE is the tendency to have better face recognition for same-race (SR) than for cross-race (CR) faces. This effect has been of interest to social psychologists for more than half a century (Allport, 1954), and has been shown to be robust across numerous research paradigms (Meissner & Brigham, 2001). From recognition memory tasks in the laboratory to suspect line-ups in police stations, the tendency to have better recognition for SR than CR faces has shown remarkable consistency.

Perhaps the best known theory of the CRE posits that this recognition deficit for CR faces is due to a lack of expertise in processing those CR faces (MacLin & Malpass, 2001; Rhodes, Brake, Taylor, & Tan, 1989; Valentine & Endo, 1992). Thus, due to de facto segregation, a lack of expertise discriminating among CR faces means that they are processed less efficiently than SR faces, eliciting the recognition difference. Although expertise certainly affects face recognition, recent evidence

indicates that CRE may instead be a manifestation of the broader *outgroup homogeneity effect* in person perception (e.g., Ackerman et al., 2006; Anthony, Copper, & Mullen, 1992; Hehman, Mania, & Gaertner, 2010; Hugenberg, Miller, & Claypool, 2007; Levin, 1996, 2000; Pauker et al., 2009; Rule, Ambady, Adams, & Macrae, 2007; see Hugenberg, Young, Bernstein, & Sacco, in press). Indeed, the tendency to confuse outgroup members with one another is ubiquitous in social cognition, and has been shown consistently across multiple research paradigms (e.g., Judd & Park, 1988; Linville, Fischer, & Salovey, 1989; Linville & Jones, 1980; Quattrone & Jones, 1980; see Ostrom & Sedikides, 1992 for a review).

In fact, it does appear clear that merely categorizing a target as an outgroup member elicits homogeneity in face perception and memory tasks. For example, Pauker et al. (2009) (see also Maclin & Malpass, 2001) found that memory for racially ambiguous, Black–White morphed targets is dependent on how those targets are categorized. Racially ambiguous targets categorized as ingroup members are remembered better than are racially ambiguous targets categorized as outgroup members. Similarly, racially ambiguous faces categorized as ingroup faces also elicit more holistic processing, a process believed to facilitate strong face encoding and memory (Michel, Corneille, & Rossion, 2010). Memory for and processing of even racially *unambiguous* same-race faces also show such outgroup homogeneity effects. For example, Bernstein, Young, and Hugenberg (2007) (see also Shriver, Young, Hugenberg, Bernstein, & Lanter, 2008) demonstrated that same-race faces labeled as outgroup members (e.g., a different university, a different personality type, a different socio-economic status) also elicit outgroup homogeneity, demonstrated as worse memory (i.e., more confusions) for outgroup faces. Similarly, Hugenberg and Corneille (2009) found that holistic processing of even same-race faces is determined by ingroup/outgroup distinctions such as a shared or

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<sup>\*</sup> Corresponding author. Psychology Department, Miami University, Oxford, OH 45056, USA.

E-mail address: [wilsonjp@muohio.edu](mailto:wilsonjp@muohio.edu) (J.P. Wilson).

unshared university affiliation. Thus, it seems clear that this social cognitive perspective of the CRE as a manifestation of the outgroup homogeneity effect has gained strong empirical support.

Despite this recent evidence that outgroup faces are perceived and remembered as more homogeneous than ingroup faces, little research has investigated how other social motives that affect perceptions of group homogeneity influence the CRE. In short, to make the strong claim that the CRE is a manifestation of the outgroup homogeneity effect, it becomes necessary to test whether other factors that influence group homogeneity also affect the CRE, while holding perceiver expertise constant. The current research seeks to address this question directly. Specifically, the current research investigates an *ingroup homogeneity effect* in face recognition. If the CRE is caused by outgroup homogeneity affecting the recognition of CR faces, then situations in which *ingroup* homogeneity arises should affect the recognition of SR faces. Thus, the current work sought to extend our understanding of the social-cognitive origins of the CRE to provide a novel demonstration of motivated ingroup homogeneity in face memory.

### Motivated ingroup homogeneity and the cross race effect

Whereas outgroup homogeneity appears to act as a default mode of processing, there are limited situations wherein individuals will be motivated to perceive the ingroup as homogeneous (see *Ostrom & Sedikides, 1992*). For example, small ingroups appear to elicit enhanced perceptions of ingroup homogeneity (*Simon & Brown, 1987*). Similarly, ingroups are seen as homogeneous on their typical or group-defining attributes (*Simon & Pettigrew, 1990*). Furthermore, manipulations that threaten participants along dimensions that are important to their identities will elicit elevated perceptions of ingroup homogeneity (*Hutchison, Jetten, Christian, & Haycraft, 2006*).

Social identity theory also predicts that ingroups will be seen as homogeneous when the distinctiveness of those ingroup identities is under threat. People are motivated to differentiate the ingroup from highly similar outgroups in order to maintain group distinctiveness (*Brown, 1984; Tajfel, Billig, Bundy, & Flament, 1971; Tajfel, 1982; Tajfel & Turner, 1986; Turner, 1978*). This *reactive distinctiveness* occurs when an ingroup's positive distinctiveness is threatened (see *Jetten, Spears, & Postmes, 2004*). In essence, when an outgroup is seen as encroaching on valued ingroup characteristics, this can create a desire to differentiate the ingroup from the encroaching outgroup. One result of this motive for differentiation is enhanced perceptions of ingroup homogeneity. Because people are motivated to maintain intergroup distinctiveness, enhancing perceptions of ingroup homogeneity will enhance the perceived (and desired) contrast between the groups.

In the current research, we leveraged this enhanced desire for ingroup homogeneity caused by distinctiveness threat to test the breadth of the social cognitive explanation of the CRE. This perspective proposes that the CRE is in part a manifestation of the broader outgroup homogeneity effect, rather than merely to differences in prior expertise with CR faces (see also *Ackerman et al., 2006; Pauker et al., 2009; Rule et al., 2007*). Importantly, whereas both expertise and social cognitive models lead to the prediction that CR faces should be recognized poorly in most situations, the social cognitive model of the CRE predicts that conditions that exacerbate perceptions of *ingroup homogeneity* should lead to a drop in ingroup recognition, even when holding perceiver expertise constant.

In two studies, White American participants encoded and then recognized the faces of SR (White) and CR (Hispanic<sup>1</sup>) faces. In each

study, participants were randomly assigned to read an essay about broader demographic changes in the United States (control) or to read an essay about Hispanic migration to the United States, an essay designed and pretested to threaten White participants' ethnic group distinctiveness (immigration threat condition). Based on the hypothesis that the CRE is a manifestation of the outgroup homogeneity effect, we hypothesized that control participants would show the outgroup homogeneity effect (i.e., the standard CRE). However, we further hypothesized that participants in the immigration threat condition should show increased *ingroup homogeneity* (i.e., a reduction in SR recognition) as a result of the threat. Whereas an outgroup homogeneity effect (i.e., the CRE) in the control condition is predicted by both an expertise and a social cognitive perspective, only the social cognitive perspective predicts the reduction in SR recognition due to distinctiveness threat.

### Study 1

Study 1 was designed as an initial test attempt to extend the social cognitive explanation of the CRE to ingroup homogeneity. If the CRE results from outgroup homogeneity, then motives that have been shown to induce perceptions of ingroup homogeneity should also enhance perceptions of ingroup homogeneity in face memory (i.e., more same-race confusions in memory). Because distinctiveness threat can enhance perceptions of ingroup homogeneity, we predicted that distinctiveness threat would manifest as more confusions among ingroup faces (i.e., poorer SR recognition).

To test this hypothesis, White American participants first read a bogus news article. On a between-subjects basis, we manipulated whether the article discussed America's aging population (control condition) or increasing Hispanic migration. Critically, whereas both articles discuss changes in American demographics, the Hispanic migration article was designed and pretested to threaten the perceived distinctiveness Whites' ethnic ingroup. All participants then completed a face memory task wherein they encoded a series of same-race faces (White) and cross-race faces (Hispanic). After a brief filler task, all participants completed a recognition phase including both White and Hispanic faces.

If Whites' ethnic ingroup distinctiveness was threatened by Hispanic migration, we hypothesized that this would translate into enhanced ingroup homogeneity in face memory. Thus, whereas the typical CRE in face memory was predicted in the control condition, we predicted a substantial drop in SR recognition when ingroup distinctiveness was threatened.

### Method

#### Participants and design

One hundred fourteen White American undergraduates at Miami University completed the study for course credit. Data for six participants were excluded from analyses due to below-chance face recognition performance. Distinctiveness threat (control vs. immigration threat) was manipulated between-subjects; target race (White vs. Hispanic) was manipulated within-subjects.

#### Stimuli

##### Target faces

The face stimuli consisted of 72 digitized, grayscale images of adult males, 36 White and 36 Hispanic. All target faces displayed neutral expressions and faced the camera. Each face was displayed at 1.7 × 2.5 in. in size. Faces had no distinctive marks, features, or jewelry. All target faces were pretested to ensure that they were consistently categorized as "White" or "Hispanic."

<sup>1</sup> Though Hispanic is more properly used as an ethnic label rather than a racial one, we will refer to the present phenomenon as the 'Cross Race Effect' to maintain continuity with previous research. All target faces were pretested to ensure that participants reliably classified them as either "White" or "Hispanic."

### Distinctiveness threat manipulation

Two separate articles, ostensibly taken from USA Today, were prepared as a manipulation of distinctiveness threat (see Appendix A). Participants in the control condition read an article about American's plans to continue working post-retirement. Participants in the experimental condition read an article claiming that the Hispanic population in the United States was soon to "explode." It was further claimed that Whites would constitute a minority in the United States within the next several decades, and that Whites and Hispanics would increasingly live and work alongside one another. Crucially, the article noted that "longstanding cultural boundaries will become permanently blurred."

To ensure that the experimental condition threatened Whites' ethnic ingroup distinctiveness relative to control, we conducted a pretest of participants' emotional reactions to these articles. Although distinctiveness threat may manifest in multiple ways (Jetten et al., 2004), of interest was whether participants would report a heightened experience of threat after reading the immigration article, relative to control. Thus, a separate sample of 69 White participants was randomly assigned to either the control or experimental article, to write about the pros and cons of the article for 5 min (to ensure that they read the article fully), and then to report their emotional reactions (angry, afraid, worried, irritated, anxious, pleased, content, satisfied, and threatened) on 7-point Likert scales. The pretest indicated that the immigration articles successfully enhanced participants' experience of threat. An independent-samples *t*-test confirms that our White American participants reported feeling more threatened after reading the immigration threat article ( $M = 3.69$ ,  $SD = 1.83$ ), relative to the control article ( $M = 2.52$ ,  $SD = 1.44$ ),  $t(67) = 2.96$ ,  $p = .004$ ,  $d = .71$ . No other emotions differed significantly between conditions, though participants did report feeling marginally more worried in the experimental condition ( $p = .065$ ), an emotion closely linked to threat. As desired, this manipulation is sufficient to elicit the experience of threat.

### Procedure

After providing informed consent, participants were seated in separate experimental cubicles. All participants were instructed the study involved two ostensibly unrelated tasks: a 'current events' task and a face memory task. In the 'current events' task, all participants read the fabricated news article which served as our experimental manipulation of distinctiveness threat. After reading the article, all participants were instructed to spend 5 min thinking and writing about their reaction to the article. Participants were instructed to write about pros and cons of the article's content, which was to ensure that participants deliberated about the article.

Following the distinctiveness threat manipulation, all participants completed a face memory task, consisting of encoding, filler, and recognition phases. This task began with an encoding phase in which participants attended to a series of faces for later recognition. All participants saw 36 faces (18 White, 18 Hispanic) presented in random sequence at the center of a computer screen. Each trial began with a fixation point at the center of the screen presented for 300 ms. Following the fixation point, the target face was presented at the center of the screen for 3 s, after which a new trial began. After participants viewed the 36 faces during the encoding phase, they completed a 5-min questionnaire unrelated to the current study, designed to clear working memory. Participants then completed the recognition phase, in which they saw the original 36 faces in addition to 36 new faces (18 White, 18 Hispanic) appear one at a time at the center of the screen, in a random order. Participants indicated whether each face was old (seen during encoding) or new via keystroke. Each face remained onscreen until the participant keyed a response, after which the next face immediately appeared. The faces used in the encoding phase were counter-balanced across participants such that each face was equally likely to appear as a target (seen during encoding) or a distractor (not seen during encoding) face.

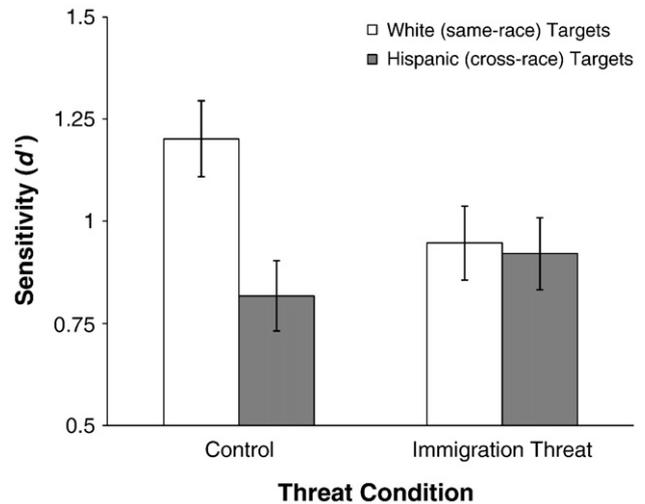


Fig. 1. Mean recognition sensitivity ( $d'$ ) as a function of Target Race and Threat Condition in Study 1. Error bars represent standard error of the mean.

At the conclusion of the recognition phase, participants provided demographic information and were thanked and debriefed.

### Results and discussion

Of interest is whether distinctiveness threat enhances ingroup homogeneity in this face memory task. Both an expertise and a social cognitive perspective on the CRE predict superior SR recognition (i.e., the CRE) in the control condition. Of interest was whether participants in the immigration threat condition would exhibit more ingroup homogeneity, observed as a decrease in recognition for SR faces. Because the distinctiveness threat manipulation does not affect perceiver expertise, the expertise hypotheses predicts continued strong SR recognition. However, the social cognitive perspective predicts that situations which enhance ingroup homogeneity should also lead to more SR confusions.

Using a signal detection framework, the CRE is operationalized as better recognition sensitivity ( $d'$ ) for SR faces than for CR faces. Hit and false alarm scores were first calculated, and then computed into separate indexes of sensitivity for SR and CR targets.<sup>2</sup> We subjected these sensitivity scores to a 2 (target race: White vs. Hispanic)  $\times$  2 (threat condition: control vs. immigration threat) mixed-model ANOVA, with repeated-measures on target race. The ANOVA yielded a main effect for target race,  $F(1,106) = 7.05$ ,  $p = .009$ . However, this main effect was qualified by the predicted target race  $\times$  threat condition interaction,  $F(1,106) = 5.36$ ,  $p = .023$ . As seen in Fig. 1, planned comparisons indicate that participants who read the control article showed superior SR ( $M = 1.20$ ,  $SD = .69$ ) relative to CR recognition ( $M = .82$ ,  $SD = .64$ ), replicating the CRE,  $t(54) = 3.46$ ,  $p = .001$ ,  $d = .57$ . Participants in the immigration threat condition, however, did not exhibit the CRE,  $t(52) = .25$ ,  $p > .8$ . As predicted by the social cognitive model of the CRE, SR recognition was significantly worse when participants' ingroup distinctiveness was threatened

<sup>2</sup> As is common in signal detection analyses, adjustments to the data were made in all studies to address the problem of empty cells: 0% was adjusted to 5% and 100% was adjusted to 95%. These adjustments were infrequent, accounting for <2% of cells across both studies. Alternate adjustments yield nearly identical results. Analysis of the criterion parameters in both studies revealed a lower criterion for CR targets,  $p's < .01$ . However, criterion did not interact with condition in either study and is not discussed further.

( $M = .95$ ,  $SD = .64$ ), relative to control ( $M = 1.20$ ,  $SD = .69$ ),  $t(106) = 1.97$ ,  $p = .05$ ,  $d = .38$ . CR recognition sensitivity did not differ across conditions,  $p > .4$ . Participant sex did not moderate the effects observed in either study.<sup>3</sup>

Consistent with past evidence, control participants showed the commonly observed outgroup homogeneity effect in face memory; perceivers were better able to discriminate among SR (ingroup) than CR (outgroup) faces. However, as predicted by the social cognitive model of the CRE, participants whose distinctiveness had been threatened also demonstrated enhanced ingroup homogeneity, observed as a reduction in the ability to discriminate among SR faces at recognition. Although past research has shown conditions in which SR recognition has been reduced (e.g., Adams, Pauker, & Weisbuch, 2010; Bernstein et al., 2007; Rule et al., 2007; Shriver et al., 2008), to the authors' knowledge, the current data are the first in which a manipulation of perceiver's motives toward ingroup homogeneity led to degraded ingroup recognition. Moreover, this was true while perceiver expertise, the perceptual quality of the stimuli, and the ingroup/outgroup memberships of the faces were held constant. By demonstrating that ingroup (SR) recognition is reduced in situations wherein ingroup homogeneity occurs, the current data support the argument that the CRE has its origins in the well-established outgroup homogeneity effect. Indeed, the current data represent the first indication that recognition of ingroup faces can be influenced by threats to that ingroup identity.

## Study 2

Study 1 provides initial evidence that threat to the distinctiveness of a racial ingroup can lead to decrements in racial ingroup face recognition, an effect that conforms closely to a social cognitive model of the CRE as a manifestation of the outgroup homogeneity effect. However, some concerns may arise due to the nature of the manipulation in Study 1. Although the control and experimental conditions of Study 1 both address demographic changes, the experimental condition addresses ethnic migration, in addition to manipulating distinctiveness threat. Perhaps participants are threatened by thoughts of immigration *per se* rather than a more specific ethnic distinctiveness threat; or alternately making a CR outgroup salient may alone induce perceived SR homogeneity (Young, Hugenberg, Bernstein, & Sacco, 2009). To rule out these possibilities, we introduced a different control condition in Study 2. This new condition was intended to equalize the topics and content of both articles, while manipulating only distinctiveness threat.

Thus, the control condition in Study 2 consists of an article that argues that Hispanic migration to the United States is increasing, but does not raise distinctiveness concerns. This new control article cited the same statistics about demographic changes as the distinctiveness threat article, but its primary thesis was that cultural boundaries would remain intact. To the extent that thoughts about immigration *per se* could increase perceptions of ingroup homogeneity, both article excerpts should induce this equally. However, because we predicted that the effects observed in Study 1 were due to distinctiveness threat, we predicted that only the article arguing that Hispanic migration would blur cultural boundaries would elicit a drop in SR recognition. Whereas participants in the new 'immigration without distinctiveness threat' control condition were expected to exhibit the commonly observed CRE, participants in the 'immigration with distinctiveness threat' condition were expected to exhibit a drop in SR recognition.

<sup>3</sup> Some theories might predict participant sex to moderate our effects, such that threat-related effects would be stronger for male participants (e.g. the Male Warrior hypothesis; Van Vugt, De Cremer, & Janssen, 2007). However, sex did not interact with condition in either experiment, and the descriptive pattern does not conform with such a prediction.

## Method

### Participants and design

Two hundred six White American undergraduates at Miami University completed the study for course credit. Data for fifteen participants were excluded due to below-chance face recognition performance, and one participant was excluded due to a programming error.

Distinctiveness threat (immigration threat vs. immigration no-threat) was manipulated between-subjects; target race (White vs. Hispanic) was manipulated within-subjects.

### Stimuli and procedure

The face stimuli were identical to those in Study 1. The procedure was also the same as in Study 1, except that the control article was replaced with the immigration without threat article. This article was intended to focus on Hispanic migration, but was designed not to threaten Whites' ethnic distinctiveness. Unlike the immigration threat article, this new non-threatening article clarified that the groups would remain distinct over time (see Appendix A).

## Results and discussion

We predicted a replication of Study 1, such that the CRE would be attenuated via a drop in SR recognition in the immigration threat condition, but that the CRE would still arise in the immigration without threat condition. Just as in Study 1, because perceiver expertise, the face stimuli, and the visual context in which the stimuli were presented were held constant, an expertise model of the CRE predicts only a main effect of target race (i.e., the CRE should emerge across conditions).

As in Study 1, we first calculated sensitivity scores separately for SR and CR targets. We subjected these sensitivity scores to a 2 (target race: White vs. Hispanic)  $\times$  2 (threat condition: immigration no-threat vs. immigration threat) mixed-model ANOVA, with repeated-measures on target race. The ANOVA yielded a main effect for target race,  $F(1,188) = 4.73$ ,  $p = .03$ . Again, this main effect was qualified by the predicted target race  $\times$  threat condition interaction,  $F(1,188) = 4.75$ ,  $p = .03$ . As seen in Fig. 2, planned comparisons indicate that participants who read the new 'immigration without threat' control article were better at recognizing SR faces ( $M = 1.15$ ,  $SD = .66$ ) relative to CR faces, ( $M = .92$ ,  $SD = .62$ ),  $t(93) = 2.96$ ,  $p = .004$ ,  $d = .36$ , replicating the CRE.

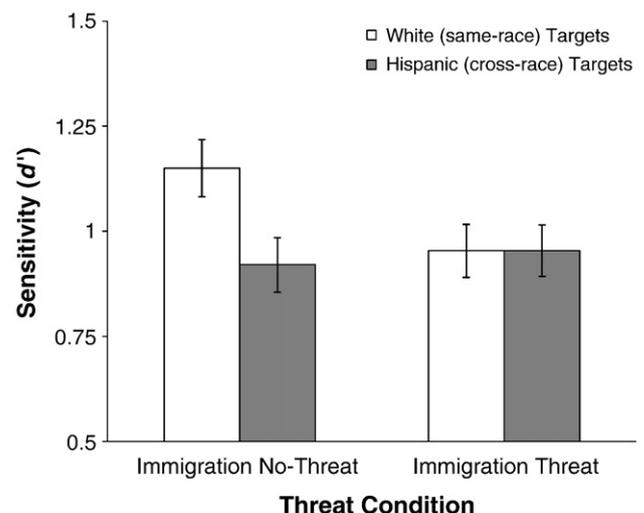


Fig. 2. Mean recognition sensitivity ( $d'$ ) as a function of Target Race and Threat Condition in Study 2. Error bars represent standard error of the mean.

Participants who read the 'immigration with threat' article, however, did not exhibit the CRE,  $t(95) = -.003, p > .9$ . As predicted by the social cognitive model of the CRE, reading the distinctiveness threatening article led to a significant drop in SR recognition ( $M = .95, SD = .61$ ), even relative to the non-threatening immigration article,  $t(188) = 2.18, p = .036, d = .32$ . CR recognition sensitivity did not differ across conditions,  $p > .7$ .

Study 2 provides further evidence that the observed effects occur due to distinctiveness threat, rather than a more general reaction to immigration-related content. Further, these results follow directly from the social cognitive model of the CRE. Participants who were told that their ingroup would remain distinct from an encroaching outgroup exhibited an outgroup homogeneity effect, showing better SR (ingroup) than CR (outgroup) recognition. Participants whose ethnic distinctiveness was threatened, however, showed exacerbated perceptions of ingroup homogeneity, observed as more SR confusions.

## General discussion

Across two studies, we sought to extend evidence for a social cognitive model of the CRE. Past research has reliably shown that the CRE is consistent with the well-established outgroup homogeneity by manipulating ingroup/outgroup distinctions (e.g., Bernstein et al., 2007; Hehman et al., 2010; Maclin & Malpass, 2001), or by manipulating perceivers motives to encode targets as ingroup members (e.g., Pauker et al., 2009), or as individuated targets (e.g., Ackerman et al., 2006; Hugenberg et al., 2007).

The current research, however, was designed to extend this evidence for the CRE as a manifestation of the outgroup homogeneity effect, by motivating perceivers toward *ingroup* homogeneity. In both experiments, we found that situations in which perceivers' ethnic distinctiveness was threatened by an encroaching outgroup led to a reduction in *same-race* recognition. We found that inducing participants to think about an impending loss of ingroup distinctiveness led to an enhanced experience of threat and a significant decrease in ingroup recognition. These studies augment the growing body of evidence suggesting that the CRE is due in large part to differential social cognitions about SR and CR faces. Indeed, a spate of recent research indicates that the CRE is powerfully moderated by perceiver motivations (e.g., Adams et al., 2010; Bernstein et al., 2007; Hehman et al., 2010; Hugenberg et al., 2007; Pauker et al., 2009; Rhodes, Locke, Ewing, & Evangelista, 2009; see (Hugenberg, Young, Bernstein, et al., *in press*; Hugenberg, Young, Sacco, et al., *in press*). However, to the authors' knowledge this is the first demonstration that social identity or distinctiveness motives influence the CRE, serving as novel empirical support of the social cognitive origins of the CRE.

Moreover, the current research serves as a test of predictions made both by perceptual expertise and social cognitive models of the CRE. Whereas perceptual expertise theories argue that the CRE occurs due to differential expertise with SR and CR faces, the social cognitive model of the CRE argues that the CRE is a manifestation of the outgroup homogeneity effect. Both theories predict that the CRE will occur in most circumstances, but the social cognitive model uniquely predicts that situations which enhance ingroup homogeneity should lead to a reduction in SR recognition. Thus, the current data also serve as something of a competitive test of explanations for the CRE, supporting the social cognitive explanation for this ubiquitous bias in face memory. Of course, our results do not refute a perceptual expertise explanation for the CRE. Indeed, it seems clear that expertise plays an important role in the CRE (Hugenberg, Young, Bernstein, et al., *in press*; Hugenberg, Young, Sacco, et al., *in press*); however, the current data indicate that the CRE is at least partially a manifestation of the outgroup homogeneity effect, and that motives to perceive groups as homogeneous can substantially affect the CRE. Moreover, given that expertise across groups was held constant via random assignment, and that all participants saw identical faces across

conditions, these data are difficult to explain using pure expertise models of the CRE.

It is important to note, however, that the observed interactions are driven by relative increases in ingroup homogeneity, rather than the ingroup being perceived as more homogeneous than the outgroup. Indeed, full reversals of the outgroup homogeneity effect are rare (see Ostrom & Sedikides, 1992), and are not predicted to occur in the current circumstances. Distinctiveness threat creates a desire to differentiate the ingroup from the outgroup (Jetten et al., 2004), and this is done most effectively by perceiving both the ingroup and the outgroup as homogeneous entities (Pickett & Brewer, 2001). Through perceptions of low variability in both ingroups and outgroups, overlap between groups is minimized and between-group distinctiveness is maximized. Although beyond the scope of the current research, this implies that manipulations that have fully reversed the outgroup homogeneity effect in past research (e.g., a minority ingroup; Simon & Brown, 1987) may also lead to lower SR than CR recognition. Future work should attempt to further illuminate conditions under which perceptions of both ingroup and outgroup variability may be driven down in the domain of face recognition. Future research should also consider the possibility that other types of threat may exert influences on face recognition. Though the current work focuses on manipulating distinctiveness, we expect that other types of threats that have been shown to affect perceptions of ingroup variability (e.g., threats to the ingroup's competence) could show similar effects on ingroup recognition (see Branscombe, Ellemers, Spears, & Doosje, 1999).

It is also worth considering the current results in light of recently published work finding that activating an intergroup context (even via the mere presence of CR faces) reduces SR recognition (Young et al., 2009). Given these past findings, one might expect that in our second experiment we would observe a drop in SR recognition in both the immigration without threat condition and the immigration with threat condition, because both make an intergroup context salient. Notably, whereas Young et al. presented SR and CR faces in blocks (SR first or CR first, depending on condition), we presented faces in random in order in all conditions. Thus, SR faces were always encoded in an intergroup context; our control conditions in both studies instantiate an intergroup context. Thus, some amount of reduction in SR recognition is likely already observed in all conditions in both experiments, because we do not have an 'SR only' condition as did Young et al. (2009). In support of this argument, we see that the magnitude of the CRE in Young et al.'s Study 1 sans intergroup context is much stronger ( $d = 1.44$ ) than the CRE in either of our control conditions ( $d$ 's  $< .6$ ). Thus, in all likelihood, the intergroup context created in the control conditions in the current studies likely already reduces SR recognition somewhat, but it is only reduced to CR levels in the presence of identity threat.

Of additional interest is whether the observed effects are limited to White perceivers thinking about Hispanic targets, or whether we should expect to see similar effects for many different social categories or ingroup/outgroup distinctions. In the current work, Hispanic targets were chosen because they were expected to tap into our White participants' pre-existing beliefs about intergroup threat. Hispanic migration is an issue of perennial political discussion in the United States. It remains an open question as to the extent to which such effects will generalize to other groups that do not stereotypically create identity threats. That said, in situations where members of a social category present identity threats to the perceiver, we do predict the present effects will obtain. For other groups that are not as capable of posing a chronic threat, these effects may be more domain-specific (e.g. science majors may only feel identity threat posed by humanities majors when the threat is specific to an academic domain), or require a more intensive manipulation of identity threat to emerge. However, more research is certainly needed to fully understand the boundary conditions on when intergroup threats translate into biases in face recognition.

Finally, we believe that this research contributes further to a more nuanced view of how intergroup contact may be related to face recognition. From an expertise hypothesis, the prediction is clear: more intergroup contact should improve face recognition by providing more expertise processing CR faces. However, from this social cognitive perspective, the effects of intergroup contact on face memory depend powerfully on the motives that contact engages. Whereas some forms of intergroup contact can create individuated representations of both SR and CR individuals (Pettigrew, 1998; Wolsko, Park, Judd, & Bachelor, 2003), likely leading to strong face memory for both ingroups and outgroups, other forms of intergroup contact (e.g., toxic intergroup situations; contact that threatens group distinctiveness) could lead to the motive to perceive both outgroups and ingroups as homogeneous, actually reducing face recognition.

### Conclusion

The current results support the social cognitive model of the CRE. In these data, conditions that enhance ingroup homogeneity make ingroup faces more difficult to recognize; this serves as one of the first demonstrations that threats to social identity can modulate the CRE. Moreover, given that the current studies hold expertise constant, such results are difficult to explain using an expertise model of the CRE. Overall, the data conform well to the perspective that the CRE may be a manifestation of the commonly observed outgroup homogeneity effect.

### Appendix A. Control article

More than three quarters of today's workers (77%) expect to work for pay even after they retire, according to a new Pew Research Center survey. Of those who feel this way, most say it is because they will want to, not because they will have to. But whatever the motivation, these expectations are dramatically out of step with the experiences of people who are already retired—just 12% of whom are currently working for pay (either part or full time), according to the Pew survey, and just 27% of whom have ever worked for pay while in retirement, according to a survey this year by another research organization. The latest Pew findings suggest that retirement is a phase of life about which public attitudes, expectations and experiences are in a period of transition. And given the demographic changes afoot (the share of adults ages 65 and older is expected to grow from 12% of the United States' population in 2000 to 21% in 2050) as well as the changes underway in the basic financial framework of retirement (fewer people now than in the past work for employers who provide defined benefit pension plans) this evolution in attitudes is likely to continue for years to come. It does not matter if a person is self-employed or not; if a person works for a big organization or a small one; if a person derives a strong sense of identity from work or not; all are equally likely to say they expect to work for pay after they retire. The expectations that today's workers have about working after retirement are sharply different from the actual experiences of today's retirees.

### Immigration threat article

#### Census data: Hispanic population to explode

Recent projections made by the US Census Bureau suggest that the Hispanic population of the United States will explode in the coming years. By the year 2050, Caucasian Americans will be a minority in the United States, mostly because of the influx of people from Mexico and other countries in Latin America. According to leading immigration experts, several big cultural changes will accompany this population shift. Within the next 20 years, Hispanic individuals will be working in the same jobs, attending the same schools, and participating in the

same community activities as their new American neighbors. Churches, the government, and other important societal groups will all be affected. It is likely that communities across the country will feel this change to a large degree. The cultural shift will occur even in places where the overall Hispanic population is currently low. Because of higher visibility in the media and in national politics, Hispanic people are sure to become an important part of everyday life in the United States. Families will become more racially mixed, and long-standing cultural boundaries will become permanently blurred. At times, it might even appear that you are in a different country. Some of us may actually find that we share many common qualities with our neighbors to the south. Whatever the case, the place we know as "America" is changing quickly, for better or worse, and this change will certainly be permanent.

### Immigration no-threat article

#### Hispanic population to explode, but will it matter to you?

Recent projections made by the US Census Bureau suggest that the Hispanic population of the United States will explode in the coming years. By the year 2050, Caucasian Americans will be a minority in the United States, mostly because of the influx of people from Mexico and other countries in Latin America. However, according to leading immigration experts, the cultural changes that one would expect to accompany this population shift may not actually occur. For the most part, Hispanic immigrants to America are adopting American values, but will remain in largely Hispanic enclaves. Immigrants are living among other immigrants, going to church with other immigrants, attending school with other immigrants. Within the next 20 years, there will be Hispanic communities throughout the United States. The population shift will occur even in places where the overall Hispanic population is currently low, but it may be largely invisible to many Americans. Despite high visibility in the media and in national politics, most White Americans' everyday lives will be unaffected. Ethnic identities will remain intact, and longstanding cultural boundaries will remain clear. Although change is afoot in the United States, existing cultural institutions are unlikely to be affected by ongoing immigration.

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