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A cross-race effect in metamemory: Predictions of face recognition are more accurate for members of our own race☆

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ABSTRACT

The Cross-Race Effect (CRE) is the well-replicated finding that people are better at recognizing faces from their own race, relative to other races. The CRE reveals systematic limitations on eyewitness identification accuracy, suggesting that some caution is warranted in evaluating cross-race identification. The CRE is problematic because jurors value eyewitness identification highly in verdict decisions. We explore how accurate people are in *predicting* their ability to recognize own-race and other-race faces. Caucasian and Asian participants viewed photographs of Caucasian and Asian faces, and made immediate judgments of learning during study. An old/new recognition test replicated the CRE: both groups displayed superior discriminability of own-race faces. Importantly, relative metamnemonic accuracy was also greater for own-race faces, indicating that the accuracy of predictions about face recognition is influenced by race. This result indicates another source of concern when eliciting or evaluating eyewitness identification: people are less accurate in judging whether they will or will not recognize a face when that face is of a different race than they are. This new result suggests that a witness's claim of being likely to recognize a suspect from a lineup should be interpreted with caution when the suspect is of a different race than the witness.

The Cross-Race Effect (CRE; also known as the Other-Race Effect or Own-Race Bias) in face recognition is one of the most replicated findings in cognitive and social psychology (see Meissner & Brigham, 2001 for a review). Across a variety of contexts, experimental methods, and ethnic groups, humans have been shown to be better at remembering faces from their own race than faces from other races. This finding is particularly important for legal and psychological scholars who study eyewitness memory, as it indicates that we are more likely to falsely identify an innocent suspect if he or she is from a different race (Brigham, Bennett, Meissner, & Mitchell, 2007; Meissner & Brigham, 2001).

Understanding the legal implications of the CRE will ultimately require a broader consideration of the ecological contexts in which eyewitness identification takes place. The literature on recognition memory takes great care to control for extraneous variables and individual differences, and the CRE has been principally demonstrated in paradigms that derive from this tradition. The agenda for the researcher interested in the *metacognition* of such judgments is to extend those well controlled recognition experiments into situations in which individuals' abilities to *monitor* their learning and memory and *control* aspects of their processing are additionally assessed. The present research takes a first step in that direction by examining how effectively learners *predict* future memory performance for own- and other-race faces. Such judgments are critically important to assess in an eyewitness setting, as an individual's assessment of how well he or she will remember a face likely plays a major role in whether he or she volunteers to attempt to pick the perpetrator from a lineup. In addition, because metamnemonic judgments often reflect accessibility of the queried materials (e.g., Benjamin, 2005; Nelson & Dunlosky, 1991), the correspondence between judgments and actual recognition might be lower for other- than own-race faces. Such a result would have legal implications, because it would imply that eyewitnesses' self-assessments of their ability to recognize a perpetrator would be less accurate for perpetrators of a different race.

Cases exist that support this idea. In 1984, Jennifer Thompson, a Caucasian woman, was sexually assaulted by a man who broke into her apartment (read more on this case at

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http://www.theinnocenceproject.org). Ms. Thompson reported having made considerable effort to memorize the face of her attacker (Cotton's Wrongful Conviction, n.d.) an African-American male, and was confident that she would be able to recognize him later. In 1985, and again in 1987, Ronald Cotton was convicted of assault, and served more than 10 years in prison for the crime before being exonerated by DNA evidence in 1995.

Some studies have examined metacognitive aspects of the CRE. Most prominently, researchers have examined how recognition confidence relates to accuracy. Confidence is a metacognitive assessment of accuracy that takes place at the time of, or following, the memory judgment, and is also an important factor in the courtroom. Jurors value eyewitness testimony highly in reaching a verdict (e.g., Benton, Ross, Bradshaw, Thomas, & Bradshaw, 2006), and indeed are instructed to weight the confidence of an eyewitness as an important factor in considering the value of the testimony (Neil v. Biggers, 1972). Unfortunately, research has shown that post-recognition confidence is an inconsistent predictor of accuracy in face recognition (e.g., Leippe & Eisenstadt, 2007; but see Lindsay, Read, & Sharma, 1998).

Much less has been done in understanding the metacognition of the CRE prior to the time of recognition. Smith, Stinson, and Prossor (2004) appear to be the only researchers to have collected predictive judgments from subjects in the context of a cross-race eyewitness experiment. After White subjects viewed a video of a staged theft (depicting either a White or Black perpetrator), but before being presented with a lineup, subjects were asked to rate both the clarity of their memory of the perpetrator and their confidence that they would be able to select the correct individual from the lineup. Smith et al. replicated the standard CRE in recognition accuracy: White subjects were more accurate at identifying the White perpetrator than the Black perpetrator. Importantly, they also found that pre-identification ratings of memory clarity were significantly higher in the own-race condition than in the other-race condition. Thus, there is some indication that judgments about memory differ between own- and other-race faces. Though these data indicate that subjects are more confident in their ability to recognize own-race faces, they have little to say about our ability to discriminate between faces that we will or will not remember within each group. The present experiment extends this literature by examining the correspondence between judgments and recognition for individual faces.

There has been considerable focus on the cognitive and social underpinnings of the CRE. Some theories focus on experience-based encoding differences (e.g., Valentine, 1991; Valentine & Endo, 1992). For example, it has been suggested that we learn to encode faces by focusing on features that are useful for differentiating individuals within our own race, but are suboptimal for differentiating other-race faces. However, this view suggests that individuals with extensive exposure to other races should be immune to the CRE, and in fact the amount of contact with other races typically plays only a very weak role in predicting the CRE (accounting for only 2% of variability in a meta-analysis; Meissner & Brigham, 2001; cf. He, Ebner, & Johnson, 2011).

Other theories concentrate on the social influences on face recognition. These social-cognitive theories suggest that faces are rapidly classified as in-group or out-group members (e.g., Sporer, 2001; see also Levin, 2000). In-group faces are further processed in an individuating manner, supporting subsequent recognition, whereas only category-defining features of out-group faces tend to be encoded. Other social-cognitive theories focus on the manner in which social motivation can affect the encoding and classification of faces (e.g., Hugenberg, Young, Bernstein, & Sacco, 2010).

Further emphasizing the contribution of superior encoding of own-race faces, Meissner, Brigham, and Butz (2005) proposed a dual-process account of the CRE. In their second experiment, participants provided Remember-Know-Guess responses following recognition of recently studied own- and other-race faces. Their results showed the typical CRE in overall recognition accuracy, but no difference between own- and other-race face recognition when considering familiarity-based responses (neither for hits nor false alarms). When considering recollection-based responses, however, own-race faces produced both a higher hit rate and lower false alarm rate than other-race faces. Meissner et al. concluded that own-race faces are encoded qualitatively better than other-race faces, which supports more accurate recollection-based recognition responses. Their findings have subsequently been replicated and extended in a process dissociation procedure (Marcon, Susa, & Meissner, 2009).

In the present paper, our goal is not to determine which of these accounts provides the best explanation of the mechanisms underlying the CRE, but rather to examine how the accuracy of metamemory judgments are influenced by the CRE. All of the explanations of the CRE discussed above rely at least partially on some form of differential encoding for own-race and other-race faces (regardless of whether the encoding differences are under volitional control). If the processing of own-race faces involves encoding attributes that enable more precise differentiation, then judgments of future memorability assessed at the time of encoding should also support superior differentiation.

An example of how superior differentiation can support both enhanced memory and metamemory accuracy can be seen in the metacognition literature for the case of word frequency. Recognition of uncommon words is superior to recognition of common words; this result derives at least in part from the fact that uncommon words are more distinctive from one another than common words. Though it was not the focus of that study, Benjamin (2003) reported a number of conditions in which metacognitive accuracy was assessed separately for uncommon and common words on a recognition task. In the relevant conditions from those experiments[1], metacognitive accuracy was higher for uncommon words in four out of four cases. The case of word frequency effects in recognition provides a concrete example of how differentiation affects the accuracy of memory and metamemory similarly.

In the context of word recognition, predictions may relate more strongly to recollection-based responses than to familiarity-based responses (e.g., Daniels, Toth, & Hertzog, 2009). As discussed above, encoding of own-race faces results in more accurate recollection-based recognition than does encoding of other-race faces, contributing to the overall CRE in recognition. Moreover, other-race faces are generally perceived as less distinctive from one another than are own-race faces (e.g., Meissner et al., 2005; Valentine & Endo, 1992). Given the greater perceived distinctiveness and higher recollection of own-race faces, it seems likely that predictions for own-race faces should be more strongly related to subsequent recognition accuracy than predictions for other-race faces.

In the present experiment, we used a standard recognition paradigm combined with a *judgment of learning* procedure to assess metamemory and memory judgments for own-race and other-race faces. This recognition procedure has been widely used in the face recognition literature (e.g., Hugenberg et al., 2010; Meissner et al., 2005; Valentine, 1991) and allows for the collection of multiple judgments across a wide range of own- and other-race faces from each subject. We tested two groups of subjects, one residing in the United States (Caucasian) and one residing in China (Asian). Each group of subjects studied an equal number of photographs of Caucasian and Asian faces. For each face, they were asked to

[1] These conditions include Experiment 1, the two Test 1 conditions from Experiment 2, and the Test 1 condition from Experiment 3.