Hindawi Publishing Corporation
Journal of Criminology
Volume 2013, Article ID 745836, 6 pages
http://dx.doi.org/10.1155/2013/745836

Research Article

The Cross-Race Effect: Resistant to Instructions

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Received 30 October 2012; Revised 10 January 2013; Accepted 11 January 2013

Academic Editor: Augustine Joseph Kposowa

The cross-race effect (CRE) is the tendency for eyewitnesses to be better at recognizing members of their own race/ethnicity than members of other races/ethnicities. It manifests in terms of both better discrimination (i.e., telling apart previously seen from new targets) and a more conservative response criterion for own-race than for other-race faces. The CRE is quite robust and generally resistant to change. Two studies examined the effectiveness of reducing the CRE with special instructions given prior to retrieval. Although instructions at retrieval did change participants' response criterion—making them less likely to identify test faces as previously seen—they did not shift their response criterion selectively for other-race faces. The findings indirectly support the importance of encoding processes in producing the CRE.

1. Introduction

There are numerous times in our criminal justice system that eyewitness testimony can make the difference between conviction and acquittal. When trials contain eyewitness testimony, jurors rely on it heavily, despite holding some erroneous beliefs about the factors that make eyewitnesses more or less accurate [1]. Because jurors rely on those beliefs in evaluating eyewitness credibility and making trial judgments [1–3], false convictions in eyewitness cases are not uncommon. Indeed, eyewitness misidentifications lead to more wrongful convictions than all other causes combined [4, 5].

One common cause of eyewitness error is the *cross-race effect* (CRE; also referred to as the own-race bias), which is the tendency to be worse at recognizing individuals from other racial/ethnic groups than one's own racial/ethnic group [6–8]. The bias is quite robust; it appears in early infancy [9], has been observed in young children [10], and persists into old age [11]. Despite the robustness of the effect, people are not necessarily aware of it; for example, Abshire and Bornstein [12] found that fewer than 50% of mock jurors correctly answered a question about the CRE although Black participants were more knowledgeable than White participants.

The reasons underlying the CRE are not clear. There are three leading classes of explanations for the effect, which focus on differential experience, encoding, and retrieval (for review, see [7, 13]). The experience-based explanation, often referred to as the *contact hypothesis*, emphasizes the differential contact that one has with one's own versus other races. The contact hypothesis posits that the degree of contact with members of a group (i.e., quantity and quality) dictates a person's ability to distinguish among group members [13, 14]. According to this view, individuals typically have more interactions with their own race than other races, resulting in the CRE. Despite the intuitive appeal of this explanation and some empirical support (e.g., [15–17]), overall findings regarding the contact hypothesis are inconsistent and relatively weak [8, 13, 18].

A second class of explanations focuses on the role that encoding operations play in the CRE (e.g., [17, 19–21]). Some researchers (e.g., [13]) have suggested that when we observe someone of our own race, or ingroup, we encode facial features differently—in greater depth, with attention to different features, or both—than when observing someone of a different race. Because people typically have more experience with own-race members, they develop heuristics for

making useful distinctions between faces—such as attending to distinguishing facial features—that may not be useful when applied to members of a different race [22, 23]. Indeed, there is evidence that individuals attend to different facial features as a function of a target face's race [24, 25] or process own-race faces more holistically [26]. This differential encoding reflects, at least in part, a tendency to perceive members of outgroups as more homogeneous than members of ingroups [20]. Hugenberg and colleagues [20, 27] have found that when perceivers are made aware prior to encoding of their tendency to engage in categorical thinking about outgroup members, they pay more attention to outgroup members' unique traits and characteristics—thereby reducing the CRE.

The third and final class of explanations deals with retrieval-based processes. Research evidence indicates that the CRE reflects different processes and decision strategies occurring at the time of retrieval. More specifically, people rely more on recollection processes, as opposed to familiarity judgments, when deciding whether they have previously seen an own-race (versus an other-race) face [21, 28]. Witnesses also have a lower (i.e., more lenient) response criterion for other-race faces, meaning that they are more willing to make a positive identification for other-race faces than they are for own-race faces [8, 13]. As a result, they make more false alarms for other-race than own-race faces (e.g., [29–31]).

Response criterion placement can be influenced by experimental manipulations that are external to the stimulus, such as instructions to adopt a more conservative response criterion (e.g., [32, 33]). Instructions designed to shift one's response criterion (such as offering a financial incentive) have yielded mixed results in a CRE paradigm, with some studies finding that incentives reduce the CRE, yet other studies finding that they do not [6, 29]. However, instructions are capable of shifting eyewitnesses' response criterion more generally, to make their responding more liberal or more conservative. For example, instructing them that the actual culprit may or may not be present in a lineup induces a more conservative response criterion [34]. The fact that people are capable of changing their response criterion, and of using different response criteria for different types of stimuli [32], suggests that it should be possible to produce criterion shifts for recognition of other-race faces. The critical question is whether a retrieval-based manipulation can selectively alter a person's response bias, so that it shifts for one class of stimuli (i.e., other-race faces), but not for another (i.e., own-race faces).

In summary, there are a number of different theories hypothesized to explain the CRE, none of which has yet to receive overwhelming support, nor has resulted in the development of appropriate remedies. There is an important practical advantage of retrieval-based explanations of the CRE, namely, that decision processes at retrieval are amenable to system variables like instructions during the lineup procedure [35, 36]. In contrast, cross-race contact and encoding processes are estimator variables that might predict differential performance with targets of different races, but they are much less susceptible to intervention by the criminal justice system. From an applied perspective, procedures that influence cross-race identifications at the retrieval stage could be readily implemented by lineup administrators (e.g., by providing those in a cross-race situation with specialized instructions before the identification). Thus, the primary purpose of the present studies is to examine the effectiveness at reducing the CRE of special instructions given prior to retrieval.

2. Experiment 1

Our initial study addressed whether altering the instructions that participants receive at the retrieval phase in a face recognition task would induce a more conservative response criterion, and whether such instructions would affect responding for own- and other-race faces differentially. We included three types of instructions: (a) control instructions, (b) conservative instructions telling participants to be extra careful when identifying a face of another race, and (c) accountability instructions telling participants that they would have to explain their identification choice, as another means of inducing a more conservative response criterion (cf. [37]). Thus, we expected: (1) that participants who received CRE instructions at retrieval would use a more conservative response criterion and (2) that there would be an interaction between instructions and target race, such that the instructions would reduce or eliminate the difference in response criterion for own- versus other-race faces.

2.1. Method

2.1.1. Participants. Participants were 17 male and 64 female White participants from a Midwestern university (M age = 21.09, SD = 3.64), who received extra course credit for their participation. A total of 6 non-White participants were dropped from the analysis.

2.1.2. Design, Materials, and Procedure. The design for the study was a 2 (target face race: White versus Black) × 3 (instructions: control versus accountability versus CRE-retrieval) mixed design, with target face race being a within-subject factor and instructions being a between-groups factor. After consenting to participate, students completed the entire study on a computer using MediaLab software. The study consisted of four phases. During the *encoding* phase, participants received instructions to look at each face carefully as they would be asked to recognize them later. They then viewed 20 own-race (White) and 20 other-race (Black) male faces (smiling with everyday clothes on), which had been matched in a pretest on memorability ratings by same-race participants. The presentation of faces was blocked by race and counterbalanced across participants; they were presented at a 3-s rate.

Phase 2 was a *filler task*, a set of trivia questions that took approximately 10 minutes. Following the trivia questions, participants completed the *retrieval* phase. They received instructions before viewing a set of 80 faces (40 old, mixed randomly with 40 new; all wore the same color shirt, which was different from the clothing worn during the encoding phase, and were not smiling) and indicated whether they had seen each face in the previous presentation. Finally, in the

contact assessment phase, participants completed an adapted form of the multicultural experiences inventory (MEI; [38]), a measure of experiences and contact with individuals of different racial/ethnic backgrounds (we do not include results for the MEI because we obtained little support for the contact hypothesis across studies. Specifically, correlations between the amount of cross-racial contact and performance measures (d' and C) ranged from .003 to .20, none of which was statistically significant).

The instruction manipulation occurred immediately prior to the retrieval phase. In the control group ($n = 27$) participants were told to indicate whether or not they had previously seen each face. A second (accountability) group of participants ($n = 27$) was told that in order to be sure the task was taken seriously, they would have to justify their choice to the experimenter and other participants upon the completion of the task (modeled on [37]). In the final (CRE-retrieval) group ($n = 27$), participants were told about the CRE (i.e., that people are better at recognizing members of their own race/ethnicity than members of other races/ethnicities) and were instructed to be sure when identifying a face of another race.

In all three groups the instructions were repeated periodically throughout the testing phase (after every 10 faces presented). Upon completing the retrieval phase, participants completed the MEI. They were then debriefed and thanked for their participation.

2.2. Results. Discrimination (d') and response criterion (C) served as the measures of interest (see Table 1). Discrimination refers to individuals' ability to tell apart previously seen (old) stimuli from new stimuli, whereas response criterion refers to their overall tendency to identify any stimuli as previously seen [33]. These measures are widely used in eyewitness research, and the CRE is associated with both better discrimination and a higher (i.e., more conservative) response criterion for own-race than for other-race faces [8].

As expected there was a main effect of target race on d', F (1, 78) = 7.78, $P < .01$, $\eta_p^2 = .09$. Participants were significantly better at discriminating "old" from "new" own-race faces ($M = .80$, SD = .07) than they were for other-race faces ($M = .76$, SD = .10). There was no main effect of instruction on d', F (2, 78) = 0.28, $P = .76$, $\eta_p^2 = .01$, nor an interaction between instruction and target race, F (2, 78) =1.03, $P = .36$, $\eta_p^2 = .02$.

There was a main effect of target race on response criterion (C), F (1, 78) = 20.50, $P < .01$, $\eta_p^2 = .21$. Specifically, participants were more conservative when making judgments for own-race faces ($M = .28$, SD = .28) than for other-race faces ($M = .16$, SD = .26). Supporting our first hypothesis, we also found a significant effect of instruction type on response criterion, F (2, 78) = 5.36, $P < .01$, $\eta_p^2 = .12$; LSD post hoc analysis determined that instructions produced a higher response criterion in the CRE-retrieval condition ($M = .32$, SE = .04) compared to the control condition ($M = .11$, SE = .04); the accountability condition ($M = .23$, SE = .04) was intermediate, and not significantly different from either of the other two conditions. Thus, it is possible to use instructions during the retrieval phase to make people more conservative during a face recognition task. The interaction between instruction and target race on response criterion was not significant, F (2, 78) = 0.71, $P = .50$, $\eta_p^2 = .02$.

Table 1: Mean (with SD) discrimination (d') and response criterion (C) as a function of instructions and target race, Experiment 1.

	Own race	Other race	Total
d'			
Control	.80 (.07)	.77 (.10)	.79
Accountability	.79 (.08)	.75 (.08)	.77
CRE-retrieval	.80 (.07)	.76 (.09)	.78
Total	.80	.76	
C			
Control	.16 (.18)	.07 (.24)	.11
Accountability	.31 (.29)	.15 (.26)	.23
CRE-retrieval	.37 (.30)	.27 (.25)	.32
Total	.28 (.28)	.16 (.26)	

3. Experiment 2

Because the retrieval instructions did not confer a greater advantage on recognition of other-race faces (i.e., there was no instructions x target race interaction), the next step we took was to provide more explanation of the CRE [20, 21]. Experiment 2 also dropped the accountability instructions in order to focus on instructions that directly targeted the CRE. In addition, Experiment 2 broadened the sample to include participants from two different racial/ethnic backgrounds. Although some CRE research uses participants of only one race, for purposes of generalization it is preferable to demonstrate a full crossover effect with multiple racial/ethnic groups [6, 7].

Hugenberg et al. [20] found that special instructions before encoding increased participants' ability to discriminate between own- and other-race faces (Hugenberg et al. did not report data on response criterion). The present study sought to replicate Hugenberg et al.'s finding while comparing special instructions at encoding to special instructions at retrieval. We predicted that both instructions would reduce the CRE, compared to a control condition.

3.1. Method

3.1.1. Participants. Participants were a total of 203 students at two separate universities (i.e., one from the Midwest with a majority of White students, and one from the Southwest with a majority of Hispanic students). We analyzed data from 83 White and 99 Hispanic participants (62 males and 141 females; age $M = 19.33$ years, SD = 2.74). Data from 21 participants of other racial backgrounds were not analyzed.

3.1.2. Design, Materials, and Procedure. The general procedure was the same as Experiment 1 except for the following changes. First, we included Hispanic faces in the target

stimuli. Thus, all participants saw the same other-race faces, which were Black. Own-race faces were White for the White participants, and Hispanic for the Hispanic participants. Second, participants received control instructions ($n = 67$), special CRE instructions prior to encoding ($n = 67$), or special instructions prior to retrieval ($n = 69$). *CRE-encoding* participants were given the instructions from Hugenberg et al. [20] before the encoding phase. The instructions informed them that "Previous research has shown that people reliably show what is known as the Cross-Race Effect (CRE) when learning faces. Basically, people tend to confuse faces that belong to other races. For example, a White learner will tend to mistake one Black face for another. Now that you know this, we would like you to try especially hard when learning faces in this task that happen to be of a different race. Do your best to try to pay close attention to what differentiates one particular face from another face of the same race, especially when that face is not of the same race as you. Remember, pay very close attention to the faces, especially when they are of a different race than you in order to try to avoid this Cross-Race Effect." *CRE-retrieval* participants were given the same instructions, except that they came prior to retrieval (accordingly, "learning" was changed to "recognizing," and "learner" was changed to "participant"). Thus, the design for the study was a 2 (target face race: own versus other) × 3 (instructions: control versus CRE-encoding versus CRE-retrieval) mixed design, with target face race being a within-subject factor and instructions being a between groups factor.

3.2. Results. The results from both universities followed the same pattern, so the data were combined for analysis (see Table 2). There was a main effect of target race on discrimination, F (1, 200) = 28.19, $P < .01$, $\eta_p^2 = .12$. Participants were significantly better at discriminating "old" from "new" own-race faces ($M = .96$, SD = .68) than they were for other-race faces ($M = .69$, SD = .55). There was no main effect of instructions on d', F (2, 200) = 0.14, $P = .87$, $\eta_p^2 = .002$, nor an interaction between instructions and target race, F (2, 200) = 0.23, $P = .79$, $\eta_p^2 = .002$.

There was a main effect of target race on response bias, F (1, 200) = 20.13, $P < .01$, $\eta_p^2 = .09$. Participants had a significantly higher (i.e., more conservative) criterion for own- ($M = .17$, SD = .47) than for other-race faces ($M = .03$, SD = .46). There was also a significant effect of instruction type on response bias, F (1, 200) = 12.30, $P < .01$, $\eta_p^2 = .06$; the response criterion was higher in the CRE-retrieval condition ($M = .20$, SE = .05) than both the control condition ($M = .03$, SE = .05) and the CRE-encoding condition ($M = .05$, SE = .05); the latter two conditions did not differ. There was no interaction between instructions and target race on response criterion, F (1, 200) = 0.73, $P = .48$, $\eta_p^2 = .007$.

4. General Discussion

Consistent with previous research on the CRE, participants in both experiments were better at recognizing own-race than other-race faces (e.g., [8]). The CRE was manifested in terms of both better discrimination and a more conservative response criterion for own-race faces, and it was obtained for both White participants (Experiments 1 and 2) and Hispanic participants (Experiment 2). Thus, as previous research has demonstrated [8], the CRE is a very robust effect.

Table 2: Mean (with SD) discrimination (d') and response criterion (C) as a function of instructions and target race, Experiment 2.

	Own race	Other race	Total
d'			
Control	.95 (.63)	.63 (.48)	.79
CRE-encoding	.98 (.67)	.70 (.62)	.84
CRE-retrieval	.97 (.72)	.71 (.55)	.85
Total	.96 (.68)	.69 (.55)	
C			
Control	.11 (.50)	−.05 (.37)	.03
CRE-encoding	.15 (.46)	−.05 (.46)	.05
CRE-retrieval	.25 (.45)	.16 (.50)	.20
Total	.17 (.47)	.03 (.46)	

Attempts at utilizing instructions to reduce the CRE have generally not proven to be successful [6]. In the present experiments, instructing participants on the CRE and encouraging them to be cautious when identifying other-race faces was successful in one sense, yet unsuccessful in another sense. The retrieval instructions were effective in that they made participants more conservative, thereby reducing false alarms. Although a more conservative response criterion would also reduce hits, the American criminal justice system is set up in such a way that most would consider that a desirable tradeoff (i.e., it is better to let a guilty party go free than to identify falsely and possibly convict an innocent person; see generally [39]).

Instructing participants on the CRE prior to retrieval was less successful in the sense that it did not reduce the CRE; that is, it did not improve performance selectively for other-race faces. As the instruction came after the faces had already been encoded, we did not expect it to improve discrimination; however, we did expect it to change the response criterion more for other-race than for own-race faces, yet it failed to do so. As in other sorts of recognition task [32, 33], identification instructions are capable of moving witnesses' response criterion up or down, but it is difficult to find instructions, or lineup procedures more generally, that have selective effects [34, 39]. The inability of instructions at the time of retrieval to moderate the CRE indirectly supports the importance of encoding processes in producing the CRE (e.g., [17, 21]. Although differential encoding of faces is less susceptible to intervention by the criminal justice system than would be differential retrieval processes, it is possible that high-frequency witnesses could nonetheless be trained to encode other-race faces more effectively [6, 20, 23].

Experiment 2 failed to replicate Hugenberg et al.'s [20] finding regarding the effectiveness of special instructions at encoding. The experiment was not significantly underpowered. In a preliminary power analysis, we used the smallest effect size for d' ($r = .19$) obtained by Hugenberg et al. and

found that for a power of .8 we would need approximately 191 participants to reveal a significant interaction between race (own versus other) and instructions. Experiment 2 included data from 182 participants (the original sample contained 203 participants, but 21 participants of other races were dropped). An alternative explanation for the discrepant findings is that we used different photos of the same individual at encoding and retrieval (i.e., a face recognition task), whereas the previous study used the identical photos at encoding and retrieval (i.e., a memory task). We used a face recognition task because it is more forensically valid; in the real world, targets do not look identical (in terms of clothing, hair, pose, etc.) at encoding and retrieval. Although many eyewitness phenomena hold across variations in the realism of the experimental task [40], future research should ascertain whether encoding instructions would be effective in forensically valid contexts.

In conclusion, the present experiments show that it is possible to raise eyewitnesses' response criterion—and thereby reduce the false alarm rate—by providing them with instructions about the CRE and exhorting them to be cautious when making identification decisions. Although such instructions do not reduce the CRE, per se—in terms of altering the response criterion selectively for other-race faces—they nonetheless have the potential to reduce false identifications.

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