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Cross-racial lineup identification: assessing the potential benefits of context reinstatement

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The current research examined the potential benefit of context reinstatement on the cross-race effect in lineup identification. Participants viewed a series of own- and other-race faces and subsequently attempted identification of these faces from target-present and target-absent lineups. The traditional cross-race effect was found on measures of discrimination accuracy and response bias; however, discrimination accuracy across own- and other-race faces was shown to interact with context reinstatement such that only own-race faces benefited from the provision of contextual information. This finding is discussed in light of encoding-based theories of the cross-race effect, and with regard to the theoretical and practical limitations of mitigating the phenomenon at the time of identification.

Keywords: eyewitness identification; cross-racial identification; lineup identification; context reinstatement; memory

Introduction

A consistent body of psychological research has demonstrated that memory for own-race faces is superior to memory for faces of another, less familiar race (Malpass & Kravitz, 1969; Meissner & Brigham, 2001). Known as the *cross-race effect* (CRE), or own-race bias, in facial recognition, a variety of social and cognitive theories have been proposed to account for the phenomenon (see Sporer, 2001). One popular account of the CRE suggests that differential experience (or interracial contact) facilitates an individual's ability to distinguish and represent own-race faces in memory, but leaves other-race faces more likely to be confused due to a failure in selecting diagnostic features at encoding (Brigham & Malpass, 1985; Chiroro & Valentine, 1995; Goldstein & Chance, 1985; Wright, Boyd, & Tredoux, 2003). Using a dual-process memory approach (see Yonelinas, 2002), Meissner, Brigham, and Butz (2005) recently suggested that this differential encoding effect may be captured by participants' ability to 'recollect' details (e.g. episodic or source information, or facial characteristics attended to, etc.) from the encoding experience. This ability to discriminate faces in memory based upon qualitative aspects of encoding appears reliable when recognizing own-race faces, whereas participants appear unable to effectively encode such qualitative information and rely upon it when recognizing other-race faces.

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In their meta-analysis of the CRE, Meissner and Brigham (2001) noted that less than 10% of the studies included in their review had examined the phenomenon within a lineup identification paradigm. Given the potential contribution of the CRE to the vast number of cases involving wrongful conviction based upon misidentification (see Scheck, Neufeld, & Dwyer, 2003), this void in the literature appears surprising. Furthermore, while studies that have examined the CRE using an eyewitness lineup paradigm have consistently observed the phenomenon across a range of racial/ethnic groups (cf. Brigham, Maass, Snyder, & Spaulding, 1982; Platz & Hosch, 1988), these studies have generally only employed target-present lineups. In fact, the CRE is often observed in false alarm responses to non-target faces, and the contributions of both correct identifications (hits) and false alarm responses are important to estimate when distinguishing between participants' ability to discriminate new vs old faces (discrimination accuracy) and their tendency to respond either liberally or conservatively to faces that are presented (i.e., response criterion; see Slone, Brigham, & Meissner, 2000; Sporer, 2001).

Recent studies (e.g. Jackiw, Arbuthnott, Pfeifer, Marcon, & Meissner, 2008; Pezdek & Blandon-Gitlin, 2005) have attempted to supplement the literature on the CRE by addressing this generally neglected aspect of the phenomenon. One such paradigm, employed by Jackiw and colleagues, involves the presentation of multiple target faces (similar to standard recognition paradigms in the face memory literature), but subsequently presents both target-present and target-absent lineups to participants, thereby allowing for the estimation of signal detection measures across conditions (see Meissner, Tredoux, Parker, & MacLin, 2005). Jackiw and colleagues observed a traditional CRE across estimates of discrimination accuracy, and further found that this effect was produced as a function of increased false alarm responses to other-race faces in target-absent lineups. Given the profound influence of the CRE in facial recognition and its potential contribution to instances of wrongful conviction, it would appear important to further document the nature of the effect in target-present and target-absent lineups and to examine factors that might potentially moderate the phenomenon at the time of identification.

One factor that may improve facial identification in general, and help to minimize the impact of the CRE in particular, involves the reinstatement of context at the time of test. It has been well established in the psychological literature that changes in context can have detrimental effects on recognizing and recalling verbal material (Godden & Baddeley, 1975; Thomson, 1972; Tulving & Thomson, 1971). Within the area of facial identification, benefits of context reinstatement have been found across several studies using different variations of context reinstatement (e.g. Bower & Karlin, 1974; Davies & Milne, 1982; Krafka & Penrod, 1985; Watkins, Ho & Tulving, 1976). Watkins and colleagues demonstrated the beneficial effects of context reinstatement when the relevant context was another face that was paired with the target face, as well as when the context was a phrase that was presented during the encoding phase. Their results showed that context reinstatement led to greater facial recognition accuracy than when participants attempted recognition absent the descriptive information. Using a slightly different paradigm, Davies and Milne (1982) examined context effects by varying both the background of target photographs and the pose/expression of the person photographed. The researchers found that both manipulations had significant effects on hits and false alarms such that changes in pose or context decreased discrimination accuracy (i.e. hits decreased while false alarms increased).

While the studies discussed above were important steps toward understanding the effects of context on memory for faces, they were each laboratory-based experiments with limited ecological validity. When studies employing more realistic paradigms are considered a benefit of context reinstatement can still be found, although the effect may be smaller (see Shapiro & Penrod, 1986). One of these more ecologically valid studies was conducted by Malpass and Devine (1981). The authors employed a staged crime paradigm and exposed half of their participants to guided memory instructions (which included components of context reinstatement) prior to the identification phase. Consistent with their predictions, Malpass and Devine found that this technique improved recognition accuracy. Another study was conducted by Krafka and Penrod (1985). In this study a target individual entered a store, paid with a traveler's check, engaged in small talk with the clerk, and then exited the store. A confederate later entered posing as a law intern and asked the clerk to identify the target from either a target-present or target-absent photo lineup. Half of the clerks had context reinstated by being shown the non-photo ID card that the target had presented, and being asked to recall what the target had talked about, done, and looked like. The authors observed a marginal effect of context reinstatement on accuracy, suggesting that the effects of context reinstatement may vary depending on the situation. This was confirmed in a later study by Cutler, Penrod, and Martens (1987).

Summarizing many of the various results regarding context reinstatement and facial recognition, Shapiro and Penrod (1986) reported in their meta-analysis that studies examining context reinstatement have produced impressive benefits by significantly increasing correct identification (hit) rates ($d = 1.91$, $k = 23$); however, context reinstatement has also been shown to significantly increase false identification rates ($d = -0.44$, $k = 18$). It should be noted that increased hit rates due to reinstatement of context have not been found universally. For example, several studies examining the cognitive interview (CI; Fisher & Geiselman, 1992), which makes use of context reinstatement, have failed to find an improvement in identification accuracy (e.g. Fisher, Quigley, Brock, Chin, & Cutler, 1990; see Fisher & Schreiber, 2007).

Given the generally positive effects of context reinstatement on improving face recognition accuracy, the current study sought to examine its potential for mitigating the CRE. One potential benefit of context reinstatement may be to improve the recognition of both own- and other-race faces, thereby providing a potential tool that could be used by law enforcement to reduce the impact of the CRE on identification. However, a theoretical perspective discussed previously, in which the CRE is a result of differential encoding processes (Meissner, Brigham, & Butz, 2005), actually suggests that only own-race faces may benefit from context reinstatement manipulations. In particular, the benefits of context reinstatement require that more qualitative information from the encoding episode be available at the time of retrieval for cueing to produce significant improvements in recognition. Given that the 'recollection' of contextually rich information has been shown to be superior for own-race faces, such a perspective would predict an interaction between context reinstatement and the CRE on identification accuracy. The current study sought to assess these predictions using a lineup recognition paradigm (Jackiw et al., 2008;

Meissner, Tredoux et al., 2005) in which participants encoded both own- and other-race faces and were later asked to identify these faces from a sequence of target-present and target-absent lineups. Context reinstatement was manipulated across participants by providing semantic information at study and, in some cases, reinstating that information at the time of identification.

Method

Participants

Eighty-two Hispanic students (68% female) were recruited via the participant pool at a large public university in Florida. All participants were awarded an hour of research credit for their time and the majority were taking an introductory psychology course. The mean age of the sample was 19 years.

Materials

Six Hispanic and six African–American male target faces were selected for the study and test phases. Faces presented at study involved targets wearing their everyday clothing in a smiling pose. A target-present and target-absent six-person lineup was created for each target face using the two-part procedure suggested by Koehnken, Malpass, and Wogalter (1996). In this manner, lineup members were chosen for their match to the perpetrator's description and then chosen for their similarity to one another. No designated 'innocent suspect' was chosen for the target-absent lineups, such that analyses focused upon the aggregate rate of false alarm responses to foils in such arrays (cf. Jackiw et al., 2008; Meissner, Tredoux et al., 2005). No foils (non-target faces) were repeated across lineups, including the target-absent and target-present lineups for a given face. Faces presented at test involved all individuals wearing a common burgundy sweatshirt in a non-smiling pose. All lineups were assessed for fairness using a mock witness technique (Doob & Kirshenbaum, 1973) and met adequate requirements for lineup size and bias. Lineup size was assessed using Tredoux's E, which estimates the number of plausible lineup foils (Tredoux, 1998). Bias was assessed using the proportions technique, which compares the proportion of time the suspect is selected from the lineup to the proportion expected by chance alone (0.17 in a six-person lineup; Brigham, Meissner, & Wasserman, 1999). For target-present lineups the average proportion of mock witnesses selecting the target was 0.18 (range: 0.14–0.27) and the average Tredoux's E was 4.63 (range: 3.62–5.52). For target-absent lineups the average Tredoux's E was 4.15 (range: 3.25–5.68).

Design and procedure

A 3 (Context Reinstatement: no information vs. name only vs. all information) $\times$ 2 (own-race vs. other-race target faces) mixed factorial design was employed. Context reinstatement was manipulated between-participants. All participants viewed the target faces and associated semantic information at encoding; however, context reinstatement was manipulated at test such that participants either received no information, the name of the target face, or all semantic information presented with the target face at study. The CRE was manipulated within-participant such that all participants responded to both Hispanic and African–American target faces and lineups. Study and test phases were blocked by race of face, with the order of presentation counterbalanced across participants and controlled for in the subsequent analyses.

All materials, instructions, and responses were presented and recorded on personal computers via a modified version of the PC_Eyewitness program (MacLin, Meissner, & Zimmerman, 2005). During each study phase, participants were explicitly instructed to pay attention to and remember the faces they were about to see, in addition to the information provided above those faces. As such, participants were performing an intentional memory task. All participants were then presented with either six Hispanic faces or six African–American faces, depending upon block sequencing. Contextual information was provided along with each face. This information included a name, undergraduate major, and hobby (e.g. ‘This is Alex. Major is History. Hobby is Basketball.’), the content of which was randomly generated for each target. Faces and contextual information were each presented for 3.5 seconds. The presentation order of each target and his corresponding contextual information was randomized across participants, with a 1 second inter-stimulus interval (ISI) between presentations. Following the study phase, participants completed a 5-minute distracter task that involved solving basic arithmetic problems.

Upon completing the distracter task, participants were instructed that they would be viewing a series of lineups and that for each lineup they should indicate if they recognized one of the faces as having been studied during the prior phase. Participants were also cautioned that for each lineup a face from the study phase might or might not be present. If participants recognized a face they were told to select that face from the lineup. If they failed to recognize a face from the lineup, they were told to select the ‘not present’ option. Participants were shown a sequence of 12 simultaneous six-person lineups, including one target-present and one target-absent lineup for each target face they had viewed previously. The order of the presentation of the lineups was counterbalanced across participants and the order of the faces within the lineups was randomly determined for each participant by the computer program. Immediately prior to presenting the lineup, context reinstatement was manipulated by providing either no information, only the name, or all of the information displayed at encoding (i.e. name, major and hobby) for the target face across both target-present and target-absent lineups. After completing the two study-test blocks across African-American and Hispanic faces, participants were asked to provide demographic information and were debriefed.

Results

Participants’ hit responses from target-present lineups and false alarm responses from target-absent lineups (aggregated across foils) were used to compute signal detection measures of discrimination accuracy (A') and response criterion (B''). Two 2 (Race of Face: Hispanic vs African-American) $\times$ 3 (Context Reinstatement: No Information vs. Name Only vs. All Information) mixed ANCOVAs were conducted across these two measures of performance. The order of presentation for African–American vs. Hispanic faces was entered as a covariate in each analysis.

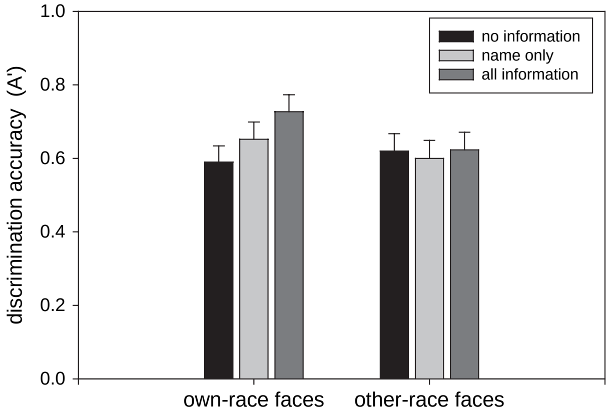

Figure 1. Interaction between context reinstatement and race of face on discrimination accuracy for target-present and target-absent lineups. From the left, bars indicate No Information, Name Only, All Information.

Discrimination accuracy

Consistent with the prior literature (Meissner & Brigham, 2001), a significant main effect of Race of Face was observed on participants' discrimination accuracy, $F(1,78) = 10.45$, $p < 0.01$, $\eta^2 = 0.12$. As expected, participants demonstrated better discrimination of own-race faces ($M = 0.66$, SD $= 0.18$) when compared with other-race faces ($M = 0.60$, SD $= 0.21$). This CRE, however, was qualified by a significant Race of Face $\times$ Context Reinstatement interaction, $F(2,79) = 3.37$, $p < 0.05$, $\eta^2 = 0.08$. Two one-way ANOVAs were conducted to further assess the influence of context reinstatement on own- vs. other-race faces. Consistent with an encoding-based account of the CRE (Meissner, Brigham, & Butz, 2005), a significant effect of context reinstatement was observed for own-race faces, $F(2,78) = .11$, $p < 0.05$, $\eta^2 = 0.07$, but not for other-race faces, $F(2,78) = 0.10$, NS, $\eta^2 = 0.00$. As displayed in Figure 1, participants' performance on own-race faces significantly improved as a result of context reinstatement, while the provision of such information at the time of identification failed to improve performance on other-race faces. Own- vs. other-race discrimination accuracy differed significantly for both the Name Only, $F(1,24) = 4.26$, $p = 0.05$, $\eta^2 = 0.15$ (Ms $= 0.65$ vs 0.60, SDs $= 0.18$ vs 0.20, respectively), and the All Information, $F(1,25) = 5.41$, $p < 0.05$, $\eta^2 = 0.18$ (Ms $= 0.73$ vs 0.62, SDs $= 0.19$ vs 0.22, respectively), conditions; however, no significant CRE was observed in the No Information condition, $F(1,27) = 1.35$, NS, $\eta^2 = 0.04$ (Ms $= 0.59$ vs 0.62, SDs $= 0.22$ vs. 0.25, respectively). There was no significant main effect of Context Reinstatement on discrimination accuracy, $F(2,78) = 0.83$, NS, $\eta^2 = 0.02$.

Response criterion

A significant main effect of Race of Face was also observed on participants' response criterion, $F(1,78) = 15.90$, $p < 0.001$, $\eta^2 = 0.17$. Consistent with the prior literature (Meissner & Brigham, 2001), participants exhibited a more conservative response criterion when responding to own-race faces ($M = 0.50$, SD $= 0.57$) than to other-race faces ($M = 0.16$, SD $= 0.61$). Own- vs. other-race criterion differences were observed in the No Information, $F(1,27) = 5.54$, $p < 0.05$, $\eta^2 = 0.17$ (*M*s = 0.46 vs. 0.09, SDs = 0.53 vs. 0.59, respectively), and All Information, $F(1,25) = 7.80$, $p < 0.01$, $\eta^2 = 0.24$ (*M*s = 0.50 vs. 0.15, SDs = 0.53 vs. 0.52, respectively), conditions, but failed to reach a conventional level of significance in the Name Only condition, $F(1,24) = 3.08$, $p = 0.09$, $\eta^2 = 0.11$ (*M*s = 0.53 vs. 0.23, SDs = 0.58 vs. 0.62, respectively). Neither the main effect of Context Reinstatement, $F(2,78) = 0.31$, NS, $\eta^2 = 0.01$, nor the Race of Face × Context Reinstatement interaction, $F(2,78) = 0.12$, NS, $\eta^2 = 0.00$, significantly influenced response criterion.

Discussion

Decades of research have documented the regularity of the CRE, particularly with regard to the potential danger of mistaken eyewitness identification (see Meissner & Brigham, 2001; Sporer, 2001). Yet surprisingly few studies have examined the CRE within the context of a lineup identification task including both target-present and target-absent lineups. The current study sought to remedy this lapse in the research literature and to further assess the extent to which the CRE might be mitigated by reinstating context at the time of identification. Given the large positive effects of context reinstatement on face identification (cf. Shapiro & Penrod, 1986), one reasonable hypothesis was that such a manipulation could improve performance on both own- and other-race faces. However, recent studies have suggested that the CRE may result from superior qualitative encoding (e.g. episodic or source information, or facial characteristics attended to, etc.) of own-race faces (Meissner, Brigham, & Butz, 2005) – a finding that would predict an interaction such that only own-race faces would benefit from the provision of contextual information at the time of identification. Consistent with an encoding-based effect, the current study demonstrated that while context reinstatement improved own-race face identifications, it failed to influence the identification of other-race faces (see Figure 1).

To explore the CRE in the current study we employed a laboratory-based, lineup recognition paradigm (Meissner, Tredoux et al., 2005) in which participants were presented with multiple faces at encoding and were tested using a sequence of both target-present and target-absent lineups. While this paradigm provides for greater experimental control, including the ability to generalize across faces within each race and the assessment of the CRE using a within-participant design, we recognize that the paradigm is limited in its ecological validity for representing the more typical eyewitness identification experience (namely, a single target 'perpetrator' in the context of an event sequence followed by a single lineup identification array). While we believe that the current results will generalize to the more typical eyewitness identification paradigm used by other researchers (e.g. Platz & Hosch, 1988), further exploration of the CRE using both the current laboratory paradigm and the more applied eyewitness paradigm appears to be warranted.

One intriguing finding from the present study was the absence of the traditional CRE in our control condition, where no context information was presented at test. One possibility is that the timing we used in presenting the face and semantic information may have distracted participants from encoding a sufficient level of facial information and thereby suppressed performance on both own- and other-race faces. The reinstatement of semantic information at test did improve identification for own-race faces, but the poor encoding skill associated with memory for other-race faces appears to have prevented the binding of facial and semantic information from which participants might have otherwise benefited. It is important to note that other studies from our laboratory (Jackiw et al., 2008) have demonstrated the traditional CRE when using a lineup recognition paradigm, but in the absence of other semantic information being provided at encoding. As a result, we believe that our No Information condition was inconsistent with more traditional attempts to asses the CRE. Further research regarding the influence of peripheral encoding information on memory for own- vs. other-race faces would prove useful.

Due to limitations in our participant pool, the current study employed only Hispanic participants. As a result, we were unable to test for a complete crossover CRE. While we believe that the current findings will be replicated in other samples, this represents an important venture for future research. Our manipulation of contextual cues based upon semantic information may also represent a limitation to the generalizability of our results. While such cues may not be representative of those present in a true eyewitness event, our intent was to capture in a conceptual way the provision of peripheral information that might be provided as cues for the retrieval of a memory. In fact, previous studies have found context reinstatement effects regardless of the way in which context was operationalized (e.g. Bower and Karlin (1974) paired faces to provide context, while Davies and Milne (1982) varied the background of photographs), making it unlikely that our results are specific to using semantic information. Nevertheless, research has suggested that context reinstatement effects in more applied settings tend to produce smaller effects (see Shapiro & Penrod, 1986). As a result, it would be prudent to conduct further research examining the influence of context reinstatement on the CRE using a more ecological approach.

Taken together, the current study represented an important step in attempting to identify factors that might ameliorate the phenomenon at the time of identification. However, if the CRE is truly an encoding-based phenomenon, then few manipulations during the lineup administration phase (e.g. lineup instructions, lineup method, etc.) are likely to improve discrimination accuracy for other-race faces. We believe this to be an important theoretical and practical proposition for further testing.

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