

Last but not least

The ambiguous-race face illusion

We discovered an interesting perceptual effect while developing a stimulus set to examine the cross-race face-recognition deficit. The cross-race effect occurs when people of one race have greater difficulty recognizing individuals of another race (MacLin and Malpass 2001; Malpass and Kravitz 1969; for meta-analytic review see Meissner and Brigham 2001). One problem with research on the cross-race effect is that a decrement in recognition performance for other-race faces can be attributed to differential experience with members of the various racial stimulus classes due to social contact (Malpass and Kravitz 1969) or due to perceptual expertise (O'Toole et al 1995).

We originally sought to develop a stimulus set of same-race and other-race faces that were virtually identical in respect to facial features and facial configurations, yet would be perceived by observers as either Hispanic or Black.⁽¹⁾ If the cross-race effect persisted with virtually identical faces, it would be difficult to attribute the cross-race effect to a lack of exposure or expertise with the stimulus class, thus requiring a different hypothesis to explain the cross-race effect. Faces ambiguous to race were constructed with a Black/Hispanic overlap with the aid of a computerized facial composite program (Faces 3.0 1998) such that facial features (eg dark eyes, broad nose, and full lips) overlapped across Black/Hispanic racial lines (figure 1a). When a key featural characteristic of a particular race acting as a racial marker was added to a face - in this case hair - the face was readily perceived as that of a person belonging to the race consistent with the racial marker (figures 1b and 1c; MacLin and Malpass 2001).⁽²⁾

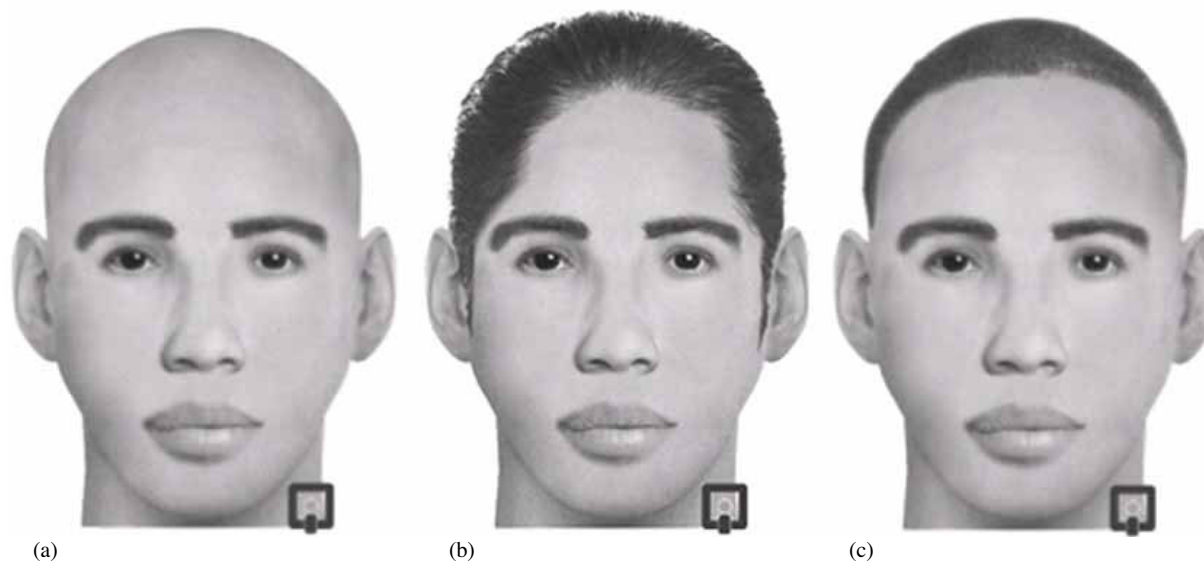


Figure 1. (a) Ambiguous-race face is missing the facial marker (hair). When an Hispanic hairstyle is added to this ambiguous-race face, the face is perceived as "Hispanic" (b). When an Afro hairstyle is added to the ambiguous-race face, the face is perceived as "Black" (c)

(1) A Black/Hispanic overlap was used because the University of Texas at El Paso (UTEP) is located on the US/Mexico border and the Hispanic students at UTEP account for approximately 73% of the student population. (2) We realize that the faces lacking the racial marker can be classified as belonging to a particular race; however, it is not until the feature acting as a racial marker is added that the face is perceived as a member of the racial category consistent with the racial marker. As such, we refer to the face without a racial marker as the 'ambiguous-race face'.

In a recent study we found that ambiguous-race faces with a stereotypical Afro hairstyle⁽³⁾ were perceived as having a darker complexion, narrower face, deeper eyes, and a wider mouth than the ambiguous-race faces with a stereotypical Hispanic hairstyle even though the faces were actually identical (MacLin and Malpass 2001). In a memory task using these ambiguous-race faces, we found that Hispanic observers were less likely to recognize faces with the black racial marker than they were to recognize faces with an own-race Hispanic racial marker. These results suggest that the cross-race effect is due to the categorization of the face as 'other-race' and not to social factors such as the amount of contact or experience one may have with faces of another race. Once the face is categorized as 'other-race', it is processed differently than same-race faces.

We found qualitative differences when observers made similarity judgments for faces with either same-race or other-race feature markers (MacLin and Malpass 2001). For example, faces perceived as Hispanic were rated as more submissive, stronger; faces perceived as Black were rated as having a wider mouth and a darker complexion. We concluded that it is the categorization of face that drives the perceptual process and affects the subsequent recognition of the faces. In another series of studies (MacLin and MacLin, in preparation), we used the implicit association test (Benaji and Hardin 1996) to determine if the faces with the other-race hair feature would elicit automatic stereotyping.⁽⁴⁾ We found that participants displayed the typical pattern of associating negative words with other-race faces and associating positive words with same-race faces.

As previously mentioned, observers reported that faces with the Afro hairstyle had a darker skin complexion than the identical faces with the Hispanic hairstyle. Furthermore, observers reported that the texture of the skin was 'creamier' for the faces with the Afro hairstyle. Because the 'Hispanic' faces have a larger and darker area of hair, it was possible that a contrast effect might explain the perceptual differences in the skin. To examine the possibility of a contrast effect, we darkened the area surrounding the face with the Afro hairstyle (figure 2a). If the effect was due to contrast, the skin should appear lighter on the Black face than on the Hispanic face. This was not the case. Observers reported no change in the skin darkness or texture after the transformation. Because the hairstyles were different shapes, a second concern was that the configural properties of the face were disrupted. Faces have both featural and configural properties. Some researchers believe that configural properties are lost when a face is inverted and features are primarily being processed (Diamond and Carey 1996; for review, see Valentine 1988). To examine whether the small changes in configuration across faces were responsible for the perceptual change in skin tone and texture, observers viewed the Black faces in an inverted orientation (figure 2b). Once again, no change in the perception of the skin tone was reported.

Another interesting aspect of this facial illusion is that once the face is perceived as belonging to a given race and the racial marker (hair) is changed to that of another race, but the other facial features remain the same, observers report a brief perceptual shift occurring to accommodate the second face. However, this process is interrupted by an abrupt categorical shift resulting from the change in perception of race. Categorical effects in perception are not uncommon and have been found for facial expressions (De Gelder et al 1997), phonemes

(3) Stereotypicality of hair was rated in a pilot study where African-Americans rated Afro hairstyle for typicality and Hispanics rated the Hispanic hairstyle for typicality.

(4) In the implicit association test, participant responses are timed to determine how quickly participants classify positive or negative words with European-American or African-American faces. Data indicate that, for white participants, positive words (love, joy, peace, ...) are associated more quickly with European-American faces, while negative words (agony, terrible, evil, ...) are associated more quickly with African-American faces.

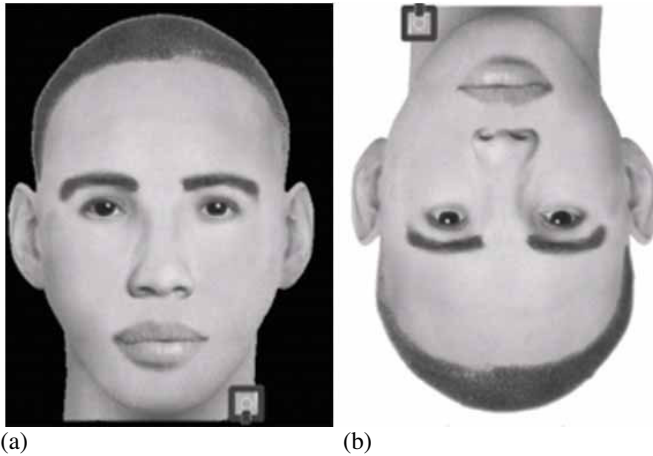


Figure 2. To control for a possible contrast effect, the background of the face with the Afro hairstyle was darkened (a). In (b), the face is inverted to reduce potential configural processing.

(Hanson 1978), graphemes (De Gelder et al 1997), phonemes (Hanson 1978), graphemes (Yasuhara and Kuklinski 1979), and colour (Goldstone 1995).

In our earlier study (MacLin and Malpass 2001), observers made racial categorizations using a multiple-choice format where various races were provided for the participants to select a racial classification. This resulted in a 68% "correct" categorization rate for ambiguous-race faces with the Black racial marker and 68% "correct" classification of the faces with the Hispanic racial marker. In an attempt to increase the categorization rate for ambiguous-race faces, we created a new set of ambiguous-race faces with an Hispanic/Black overlapping dimension and allowed the participants to make open-ended responses when categorizing race rather than providing the multiple-choice format used in our earlier study. We found that approximately 90% of the ambiguous-race faces with the Afro hairstyle feature were classified as "Black", while 80% of the ambiguous-race faces with the Hispanic hairstyle feature were classified as "Hispanic". Thus, classification rates increased by about 22% for "Black" faces and about 12% for "Hispanic" faces, indicating that the combination of new stimuli and the open-ended response format served to increase the salience of racial categorization.

When evaluating these findings, it is important to keep in mind that the "Black" and "Hispanic" versions of each ambiguous-race face are structurally identical with the sole exception of hair. The effect of a single feature to so directly alter the classification of race and drive the perceptual process is intriguing. Clearly, faces are perceived differently in a highly configural way (Diamond and Carey 1986). However, when a feature functioning as a racial marker is changed, the configuration remains relatively unchanged except for the area surrounding the hairline. Featural processing has been thought to be inferior to configural processing as demonstrated by research on the inversion effect (for review see Valentine 1988). Contrary to these findings, featural processing has been demonstrated to be important when forming facial prototypes (Cabeza and Kato 2000). Our research has demonstrated that featural processing is also important when a feature acts as a racial marker. We believe that this feature is used to classify faces during the early stages of face recognition. This in turn allows a face to be perceived as Black (other-race) or Hispanic (same-race), which in turn drives the configural process.

In summary, our data and data from other studies (eg Levin 2000) have demonstrated that categorization of race plays a substantial role in the perception and representation of faces. When a key feature acting as a racial marker is present, it causes a face to be categorized as one race or another, thereby altering perception of the face as consistent with other exemplars from the categorized race. Furthermore, categorization appears to alter the storage and

representation of individual characteristics that enable the face to be subsequently recognized. Clearly it is not that we are unable to recognize other-race faces or that we are unable to derive information from the stimulus class, as the perceptual-expertise hypothesis might suggest. Rather, the ambiguous-race face illusion suggests that other-race faces are processed differently than same-race faces as a result of the categorization process. This categorization process may explain why people are less able to recognize faces of another race.

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Otto H MacLin

Department of Psychology, University of Northern Iowa, Cedar Falls, IA 50614, USA;

e-mail: Otto.MacLin@uni.edu

Roy S Malpass

Department of Psychology, University of Texas at El Paso, El Paso, TX 79968, USA;

e-mail: rmalpass@utep.edu

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