Examining The Cross-Race Effect Using Racially Ambiguous Faces [1]

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Abstract

The cross-race effect occurs when other-race faces are more difficult to recognize than same-race faces. This well-known phenomenon poses a problem when eyewitnesses to a crime are required to identify persons of another race. This problem was addressed via a face recognition test using racially ambiguous faces. Fifteen Hispanic (UTEP) students participated in a standard face recognition task. During the encoding phase they were presented with 24 racially ambiguous composite faces (12 "Hispanic" and 12 "black"). During the recognition phase they were presented with 24 “old” and 24 “new” composite faces and asked to identify which faces they had previously seen. Results showed a cross-race effect: participants were more accurate at recognizing same-race faces than other-race faces. These findings suggest that the cross-race effect can be attributed to a perceptual categorization of race.

Research has reliably demonstrated that other-race faces are more difficult to accurately recognize than same-race faces, this effect is known as the *cross-race effect* (Chance & Goldstein, 1996; Malpass & Kravitz, 1969). This phenomenon can pose a problem when eyewitnesses to a crime are required to identify persons of another race. Specifically, cross-race identifications can result in a wrongful identification of an individual, possibly leading to the incarceration of an innocent person. For this reason, a great deal of research has focused on examining the causes of the cross-race effect and its impact on face recognition and identification accuracy (Brigham & Barkowitz, 1978; Chance, Goldstein, & McBride, 1975; Elliott, Wills, & Goldstein, 1973; Goldstein & Chance, 1978b; Goldstein & Chance, 1985; Lindsay & Wells, 1983; Platz & Hosch, 1988). As a result, a number of theories have been developed in an attempt to explain why the cross-race effect occurs (Brigham & Barkowitz, 1978; Chance & Goldstein, 1996; Galper, 1973; Malpass, 1990; Seeleman, 1940), yet there is currently no general consensus on any one theory. Three of the more prevalent theories are the *inherent stimulus differences hypothesis (*Chance & Goldstein, 1996), the *social attitude hypothesis* (Seeleman, 1940), and the *differential experience hypothesis* (Malpass & Kravitz, 1969).

One hypothesis which is generally offered as a possible explanation for the cross-race effect is the *inherent stimulus differences hypothesi*s (Chance & Goldstein, 1996) which states that the cross-race bias can be attributed to the

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belief that some races are more homogeneous than others. Goldstein and Chance (1978) found no correlation between the perceptual similarity among Japanese faces compared to similarity among White faces according to White American men and women undergraduates. In addition, Goldstein (1979a,b) used anthropological studies comparing physical measurements of faces of different ethnic groups and found no consistent differences in homogeneity among the faces of a variety of groups. Another hypothesis, which is also generally offered as an explanation of the cross-race effect, is the *social attitude hypothesis* (Brigham & Barkowitz, 1978; Seeleman, 1940) which asserts that an individual's interracial attitudes affect their face recognition ability. Seeleman (1940) found that prejudiced White participants were less likely to accurately recognize black faces than white faces. Similarly, Galper (1973) found that American White students having attended a black studies course and having chosen close association with Black students were able to accurately recognize Blacks in a recognition task. In contrast, Brigham and Barkowitz (1978) found no correlation between Blacks' and Whites' cross-racial prejudices and recognition accuracy.

A third hypothesis commonly used as a possible explanation of the cross-race effect is the *differential experience hypothesis* which posits that one's level of experience and contact with own- and other-race individuals affects recognition ability (Malpass & Kravitz, 1969; Platz & Hosch, 1988). Cross, Cross, and Daly (1971) found that Whites who lived in integrated communities exhibited greater recognition ability for Black faces than did those who lived in segregated communities. Feinman and Entwistle (1976) reported that adults who have close friends of another race exhibit less of a cross-race bias than those who did not, and that children who live in a mixed-race environment exhibited less of a cross-race bias than those who live in segregated communities. Platz and Hosch (1988) examined the ability of Black and White convenience store clerks to recognize Hispanics in El Paso, Texas, a city heavily populated with Hispanics. In contrast to the above results, they found that the degree of experience with another race did not facilitate recognition for other-race faces. Their results support Malpass and Kravitz (1969) who found no correlation between self-reported cross-racial experience and recognition accuracy. Also associated with the *differential experience hypothesis* is the *schema hypothesis* (Goldstein & Chance, 1980; Chance, Turner, & Goldstein, 1982) which asserts that an age-related memory schema develops over time for own-race faces, facilitating recognition. Research by Chance, Turner, and Goldstein (1982) supported this hypothesis using participants ranging in age from 6 to 20 years. Children in grades one and two recognized both white and Asian faces equally well. Recognition accuracy for older participants, however, was superior for White faces versus Asian faces, thus lending support to the *differential experience hypothesis*.

Overall, there still remains a question as to why the cross-race effect occurs. Research in this area has consistently used Blacks, Whites, and Asians as participants and stimuli (Brigham & Barkowitz, 1978; Chance, Goldstein, & McBride, 1975; Chance et al., 1982; Cross, Cross, & Daly, 1971; Elliott, Wills, & Goldstein, 1973; Goldstein & Chance, 1978; Goldstein & Chance, 1985; Malpass & Kravitz, 1969). Few studies have included Hispanics in their research design (Platz & Hosch, 1988; Teitelbaum & Geiselman, 1997). Given this, the present study examined the cross-race effect with Hispanic participants using racially ambiguous faces as stimuli. The ambiguous faces were created such that certain facial features (i.e., eyes, nose and mouth) overlapped across Hispanic and Black racial lines. Hair was used in this study as a racial marker so that when the racial marker is absent it is difficult to determine which race the face

belongs. Once the feature is added the face is easily perceived as a member of a particular race (Holguin, McQuiston, MacLin, & Malpass, April 2000). Thus, we will examine the cross-race face effect by determining if the faces are perceived as either Black or Hispanic depending on the racial marker.

Method

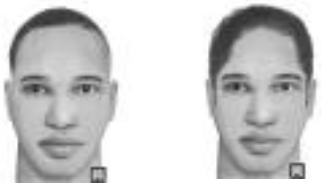
Participants

Fifteen Hispanic participants from the UTEP subject pool participated in this experiment. The participants were compensated for their time with research credit. The participants ranged in age between 18 to 26 years. All participants were treated in accordance with the "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 1992).

Stimuli

Twenty-four racially ambiguous faces containing features (i.e., full lips, broad noses, dark eyebrows, dark eyes, dark hair) which overlapped between Hispanics and Blacks (see Figure 1) were created using Faces 3.0, a facial composite production system (1998). The racially ambiguous faces contained features that, while common to Hispanics and Blacks, could not be classified exclusively as Black or Hispanic until the race was defined by a "key feature" that acts as a racial marker. In this study, the racial marker was hair.

Figure 1. Example of racially ambiguous composite faces



From the 24 racially ambiguous faces, 24 Hispanic faces were created by fitting each ambiguous face with a Hispanic hairstyle and 24 Black faces were created by fitting each ambiguous face with a Black hairstyle. Four hairstyles (Figure 2) of each race were selected based on ratings from a pilot study (Table 1).

Figure 2a. Four Hispanic hairstyles

Figure 2b. Four Black Hairstyles

Once the key feature was added to the face (hairtype) it acts as a racial marker causing the face to no longer be ambiguous as to race. From the 24 Hispanic faces, 6 of the faces had one hairstyle while 6 other faces had the second hairstyle, and so on. Likewise, from the 24 Black faces, 6 of the faces had one hairstyle while 6 other faces had a second hairstyle, etc. For the training phase, half of the faces for each race were selected (3 of each hairstyle). The remaining half were used as new faces in the recognition phase. The faces were counterbalanced in order to display them during the recognition phase half of the time as "old" and the other half of the time as "new".

Procedure

Following completing the informed consent documentation, participants were assigned a computer and seated approximately one foot away from the screen. Prior to receiving instructions participants provided demographic information by answering questions on the computer screen.

Participants were told they would be viewing a series of faces on the computer

screen from which they would later be asked questions. During the encoding phase, each of the 24 "old" faces were presented for 3 sec. with an interstimulus interval of 5 sec. Faces

Table 1. Results from Pilot study

(Hispanic N=13)	Mean	Std. Deviation
Hair 1	3.00	1.22
Hair 2	4.46	.66
Hair 3	3.77	1.24
Hair 4	3.00	1.53
(Black N=12)	**Means**	**Std. Deviation**
Hair 1	4.50	.67
Hair 2	3.42	1.38
Hair 3	4.33	.98
Hair 4	3.25	1.82

were presented randomly with the restriction that no more than three faces of the same race were presented in sequence. Following the encoding phase, participants completed a 5-minute distracter task, which was unrelated to any aspect of the experiment (i.e., a word puzzle). The recognition phase immediately followed the distracter task. Participants were instructed to identify which face was "old" by pressing the left arrow key and the right arrow key for the "new" faces. In the recognition phase, participants were shown a total of 48 faces (24 "old" and 24 "new") with an equal distribution of Hispanic and Black faces. The faces were presented in a random order for 5 sec. with an 8 sec. interstimulus interval, again applying the restriction that no more than two faces of the same race were shown in sequence. After completion of the recognition phase, participants were debriefed, thanked, and dismissed.

Results and Discussion

In order to examine hits and false alarms in the form of decision theory, recognition scores were converted to A' (Rae, 1976). Overall, Hispanic faces were recognized better than Black faces by Hispanic participants ($t(1,14) = -2.24$, $p < .05$).

Table 2: Results from recognition task.

Faces	Hits	False Alarms	A-Prime
Black	.57	.49	.576*
Hispanic	.56	.22	.705*

* Significantly different at $p<.05$

This can be attributed to the higher percentage of false alarms for the Black faces versus those of Hispanic faces and as hits for Hispanic and Black faces are equivalent (see Table 2). Results showed no statistical significant difference in the ability for participants to recognize "old" Black and "old" Hispanic faces. However, "new" Black faces were falsely recognized more often than "new" Hispanic faces ($t(1, 13) = 4.78$, $p < .01$). In other words, Hispanics were accurate in correctly identifying previously unseen Hispanic faces but not as accurate in identifying unseen Black faces. Hispanics were biased towards responding to "new" Black faces where as they often incorrectly identified "new" Black faces as "old". Thus, the results are consistent with findings from other cross-race research (Meissner & Brigham, 2000; Shapiro & Penrod, 1986).

Furthermore, the results from this study suggest that the cross-race effect is not necessarily caused by inexperience with another race, reason being that even though our face stimuli were identical across races a cross-race effect was still elicited. Thus, indicating that the cross-race effect may be attributed to a perceptual categorization of race. Further examination of why identical racially ambiguous faces were perceived differently

according to the racial marker is needed. This research should create other facial features and racial markers such as Hispanic/Asian, using eyes as a racial marker, in order to determine if they can elicit a cross-race effect. In addition, data from Black participants is necessary to determine if a cross-race effect for ambiguous race faces can be elicited from Black participants.

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