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Cross-Racial Facial Identification: Black and White Oriented Elaborative Processing

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CROSS-RACIAL FACIAL IDENTIFICATION:

BLACK AND WHITE ORIENTED ELABORATIVE PROCESSING

by

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ABSTRACT

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The present study was conducted to affect the own-race bias effect in facial recognition by using an elaboration process. According to method, 45 Black and 45 White college male and female participants completed the experiment. Participants were presented Black and White faces on a screen. Each face was rated using 1)Black-Oriented instructions which focused on features such as eye size, nose width, and lips, 2)White-Oriented instructions which focused on eye color, hair color, and hair texture, 3) Attitude-Oriented instructions which focused on intelligence, friendliness, and honesty. The primary dependent variable was a measure of discriminability using proportion of hits and false alarms, d'. An analysis of variance performed on the d' scores failed to support the hypothesis that the instructions manipulation would affect recognition, although there was a trend for greater discriminability in the Attitude-Oriented group. However, instruction did interact with stimulus race with better recognition of White faces for the Attitude-Oriented and Black-Oriented groups. Also, both races better recognized White faces. Finally, there was no relationship between the amount of other group contact and discriminability.

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God is good all the time, all the time God is good! To him I owe all my success, for he is my strength, my rock, and my shield. I am grateful for the opportunity to work with a very dedicated and hardworking chair, Dr. Mikulka. Dr. Mikulka, I can not thank you enough for your patience, your undying determination, and your support, you are truly a wonderful person. I wish to thank my mother for continuing to stand behind me offering unconditional love and support. To all others that I have not mentioned sign your name here _____.

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INTRODUCTION

"Do they all look alike?" This questions has been addressed by many studies of cross-racial facial identification. Cross-race identification refers to the finding that recognition is better for faces of participants' own race than for other races. Eyewitness testimony is one example of why identification of other races is important. According to Lasota (1974) eyewitness identification procedures are considered by police as one of the most important techniques used to apprehend and convict criminals. Photographic identification in which the eyewitness either examines photographs or looks through books of mugshots is frequently used to identify a subject of another race. The accuracy of the eyewitness may determine whether the suspect will be convicted. The chances of accurately identifying suspects of another race are slimmer than identifying suspects of the same race. Theoretical explanations of why this effect occurs has interested many researchers.

Bothwell, Brigham, and Malpass (1989) conducted a meta-analysis of eleven different studies that examined the effect of cross-racial bias. Each study investigated own-race bias by exposing Black and White subjects to a set of critical slides of Black and White faces. After a short interval, subjects were tested on their ability to recognize the critical faces from a large set of faces. Participants' recognition-ability scores were calculated. The recognition-ability score is usually represented as d-prime (d'). Participants are given credit for responding "yes" to the critical slides, but penalized for yes responses (false alarms) to the distractor slides. Results indicate that both Black and White participants revealed an overall tendency to recognize own-race faces better than

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other-race faces. d' prime scores from Black participants were relatively larger than d' scores for White participants. Bothwell et al. suggest that this was primarily due to data from two studies used in the meta-analysis. In Malpass and Kravitz (1969) and Barkowitz and Brigham (1982) Blacks performed better on White faces than on Black faces. Bothwell et al. found white stimuli more easily recognizable in both studies. Inconsistencies exist however, in whether performance on recognition tasks is better for Black or White participants.

Anthony, Cooper, and Mullen (1992) conducted a meta-analysis to examine the own-race bias effect. The meta-analysis included a total of 15 studies, studies in Bothwell et al. (1989) along with four additional studies (Barkowitz & Brigham, 1982; Barkowitz & Brigham (1982), Study 2, Brigham & Barkowitz, 1978; Brigham & Williamson, 1979; Chance, Goldstein, & McBride, 1975; Cross, Cross, & Daly, 1971; Devine & Malpass, 1985; Ellis & Deregowski, 1981; Feinman & Entwisle, 1976; Galper, 1973; Lindsay, Jack, & Christian, 1990; Malpass, 1974; Malpass & Kravitz, 1969; Malpass, Lavigueur, & Weldon, 1973; Shepherd, Deregowski, & Ellis, 1974). Anthony and colleagues found that cross-racial facial identification was better for Black subjects than for White subjects. The finding is different from the Bothwell et al. (1989) meta-analysis, which demonstrated nearly identical cross-racial identification for Black and White subjects.

Researchers of facial recognition have left the question of why a difference exists between Whites and Blacks in the recognition of faces, unanswered. Various theories have developed in the quest to find answers to why the own-race bias effect occurs. The "Contact Hypothesis" is one proposal some researchers use to explain own-race bias (Lindsay, Jack, & Christian, 1991; Ng & Lindsay, 1994). According to this hypothesis the

more experience or "contact" a person has with members of another race the better their identification or recognition memory will be for people of that race. Lack of contact with other races would be expected to result in poorer recognition or identification of people of other races. In a study conducted by Lindsay, Jack, and Christian (1990), subjects were required to indicate how much contact they had with members of another race on a 5-point scale ranging from 1 (virtually no interaction) to 5 (extensive interaction). In addition, subjects were tested on a delayed match-to-sample task to measure their performance on facial recognition. A photograph of a Black or White face was presented to each subject followed by a test pair which included the target face and a matched foil. One-half of the target faces were on the left side and one-half of the target faces were on the right side. The subjects selected the target by saying "left" or "right". A positive correlation was found between target race recognition and self-rating of the amount of interaction with members of the other race. Blacks who performed equally well on both White and Black faces also reported more contact with other races than Whites. However, White subjects demonstrated own-race bias and reported less interaction with members of other races.

Ng and Lindsay (1994) also used the Contact Hypothesis as a theoretical explanation for the own-race bias effect. The study by Ng and Lindsay introduced the "they all look alike" hypothesis or Heterogeneity Hypothesis. The Heterogeneity Hypothesis implies that other-race faces are perceived as more homogenous than faces of the same race. White and Eastern Asian participants were presented a facial recognition task. Heterogeneity was measured by requiring subjects to examine facial features of 24 targets and circle the degree of similarity between these targets and four comparison faces

on a 9-point likert type scale ranging from 0 (not at all similar) to 9 (very similar). Contact and interaction was determined by a questionnaire that included listings of racial backgrounds, race of closest friends, and experiences with the other race. Participants were shown pictures of faces previously seen in the comparison phase of the experiment and were required to report whether they had seen the face before. Results indicated that as expected an own-race bias existed for both White and Eastern Asian participants. Both Eastern Asian and White participants reported greater interaction with own race than with other race. The degree of other race interaction, however, had no effect on facial recognition.

Ng and Lindsay (1994) also examined racial attitudes. These researchers suggest that negative attitudes toward another race have an effect on a person's perception. Prejudiced subjects may cease recognition processing when a face of a member of another race is observed. Therefore, performance of recognition of faces of another race by individuals who report prejudice may be poorer than recognition of own-race faces. In regard to the Heterogeneity Hypothesis, both Whites and Eastern Asians rated members of the other race as more similar than members of their own racial group. Perceived similarity, however, was not significantly related to accuracy of facial recognition.

The Heterogeneity hypothesis also was described in the Anthony, Copper, and Mullen (1992) meta-analysis. Anthony and colleagues called this effect the "relative heterogeneity effect" which asserts the tendency for people to perceive the larger group as more heterogeneous than the smaller group. The larger the group becomes the less salient the members become, the smaller the group the more salient the members. For example, Whites are the majority in America, and less individually salient, therefore, more effort is

put into distinguishing Whites from one another. Blacks are a minority or out-group and Whites process them using prototypes, looking for group traits, rather than individual characteristics. Anthony et al found a tendency for participants to remember faces of in-group members better than faces of out-group members. This effect was stronger in White participants. Cross-racial identification was better for Black participants than for White participants.

The Race-Specific Perceptual Expertise Hypothesis also was introduced in Lindsay et al. (1990). They hypothesized that people develop specialized expertise at processing faces of particular races, usually their own race. For example, White subjects may pay closer attention to eye color or hair color, because these characteristics are important in distinguishing people of this race. Blacks on the other hand, may pay closer attention to face structure and position of the eyes and less attention to eye color or hair color. Lindsay et al. tested this hypothesis by presenting Black and White subjects with a delayed match-to-sample task. Each trial briefly presented a photograph of a Black or a White face followed by a test pair composed of the target face and a distractor face. Participants reported whether the target face was on the left or the right side. Results of this study found evidence of own-race bias. White subjects performed significantly better on White faces than on Black faces. Surprisingly, Blacks performed equally well on Black and White faces. The Race-Specific Perceptual Expertise Hypothesis was not supported by Lindsay and colleagues. Lindsay et al. attribute this outcome to the possibility that expertise in perceiving faces of particular races is associated with increased ability to extract configural information. Lindsay and colleagues also consider the short delay between presentation of faces as an explanation for the lack of support for the Race-

Specific Perceptual Hypothesis. Lindsay et al. suggest that allowing more time between presentation of faces may yield race-specific perceptual expertise.

According to Shepherd and Deregowski (1981) Whites and Blacks tend to look at different facial features. This idea seems consistent with the perceptual hypothesis discussed above. Shepherd and Deregowski examined the recognition ability of Zimbabwean and British subjects for Zimbabwean (Black) and British (White) faces. Distinctive cues for recognition of African and European faces were reported. Skin color, expression, and broadness of nose were features used to discriminate African faces. Hair color, hair length, and age were features used for discriminating European faces. European subjects discriminated primarily in terms of racial features, whereas African participants used a wider range of cues.

Forewarning is a manipulation to increase recognition that researchers have used to examine own race bias. According to Brigham and Barkowitz (1978) forewarning may be of considerable importance in cross-racial identification. Whether or not subjects are aware that they will be asked to identify the target later may affect their performance. Subjects who are forewarned are expected to perform better on recognition tasks. Brigham and Barkowitz conducted a study in which subjects were shown 24 target slides. After a five minute break subjects viewed 72 slides in random order (24 prior targets and 48 distractors) and were asked to rate on a scale of 1 to 6 the certainty that they had or had not seen the face before (1=certain that it was not seen before and 6=certain that it was seen before). One-half of the subjects were forewarned. The forewarning manipulation did not affect recognition. Results demonstrated a large same race bias in recognition. Both Whites and Blacks performed significantly better at identifying pictures

of their own race.

Time delay and incentive were investigated by Barkowitz and Brigham (1982). Subjects were assigned to one of three conditions: immediate (10 minute delay), 2-day delay, and 7-day delay for the recognition task. The high incentive manipulation told the subjects that a lottery would be held after the recognition task. Money and tickets to the lottery could be obtained by each correct identification. There was no mention of a lottery in the second condition. A total of 24 target slides were selected from 72 slides. The target slides were shown at a rate of 1.5 seconds with an interstimulus interval of .5 seconds. In the second session slides were presented for 6 seconds with an interstimulus interval of .5 seconds. During the interstimulus interval, subjects were required to record whether the slide presented was "old" or "new". Barkowitz and Brigham found that subjects in the immediate condition performed significantly better than subjects in the 2-day and one week condition. A significant own-race bias was found only for White subjects. Pictures of Whites and females were recognized better than pictures of Blacks. Overall, females recognized more faces than males in each delay condition. Additionally, there were no significant differences for the incentive manipulation.

Age of stimulus is a another variable that has been significantly related to facial recognition. Studies of age of stimulus have reported significant differences in the recognition of old versus young faces. Fulton and Bartlett (1991) conducted a study in which subjects were presented young and old faces and were required to rate their pleasantness on a 5-point scale (1=most pleasant and 5=least pleasant). Subjects were shown a second series of faces and asked to state if the faces shown had been seen before. Young subjects exceeded elderly subjects in recognizing young faces and elderly subjects

exceeded young subjects in recognizing old faces. This demonstrates an age related recognition pattern like the cross-race bias.

List (1986) examined face recognition in fifth graders, college students, and older adults. The subjects watched a videotape of a staged shoplifting. Subjects were then required to recall the characteristics of the actresses in the video. Results demonstrated that fifth graders and college students recognized the younger actresses more accurately than did the older subjects. Older subjects performed better in the recognition of an older actress than did the younger subjects.

Shapiro and Penrod (1986) performed a major meta-analysis of face recognition with over 100 studies and found that elaboration is one of the strongest determinants of facial identification. Elaboration refers to whether a face is associated or paired with one or several descriptors versus none. The studies reported by Shapiro and Penrod were manipulated by pairing targets with rich (e.g., several descriptions) or poor elaboration (e.g., no descriptions).

Winograd (1978) compared the efficiency of three types of processing strategies on the memory of faces: (1) "physical aspect" in which subjects rate one physical aspect of each face (e.g., "Does he have a big nose?"); (2) "distinctive features" in which subjects make their own choice of the most distinctive physical feature of a face; and (3) "trait tasks" which allow subjects to judge a face along personality dimensions (e.g., pleasant, intelligent, honest). Winograd found that the distinctive features and trait conditions had better facial recognition.

Valentine and Bruce (1986) studied the effect of elaboration strategy on the recognition of faces and objects. Subjects were assigned to a feature judgment group

(e.g., "What is the most distinctive feature about face/house?") or trait judgement group (e.g., "What personality trait/adjective best describes the face/house?"). Subjects were presented 20 target slides. Participants in the face trait condition were instructed to write down the personality trait that they thought best described the face: dependable, friendly, cautious, moody, intelligent, alert, worried, honest, or snobbish. In the face feature condition, subjects reported whether the distinctive feature was ears, eyes, head shape, cheekbones, nose, eyebrows, hair, chin, or lips. For the object trait condition (house) the examples of adjectives were scruffy, traditional, homely, cold, dark, expensive, ugly, elegant, and functional. The examples for the features given were: windows, front doors, shape of roof, tiles, chimney, beams, shape of house, garden wall, and garage door. Next, subjects were given a recognition task which included distractor items. One-half the items were presented upside-down. Results indicate that participants performed better in the recognition of faces than objects. There were no differences in the trait and feature condition. The different elaboration encoding activities led to the same recognition.

Parkin and Goodwin (1982) included "affective processing" (personality judgments) and "structural processing" (physical features) in their study. These researchers included the affective processing condition to assess the meaning of targets' expression, because the first author's experience with trait-based judgments has shown that some subjects thought it unfair to make trait-based judgments about people they did not know and that judgments about personality may be based purely on physical judgment (e.g., "I do not like men with beady eyes"). Parkin and Goodwin photographed twenty targets against a plain background. Each person (target) posed once with a serious expression and once with a happy expression. Persons of similar age and physical

characteristics were also photographed, one-half with a serious expression and one-half with a happy expression (distractors). Participants in the affective condition were instructed to record the adjective that best described each face. Responses were chosen from a checklist that contained the emotional states anxious, sullen, serious, thoughtful, content, and cheerful. Participants in the structural condition were instructed to choose the most distinctive feature of each face. The structural condition response sheet included the following facial feature: hair, nose, eyes, mouth, chin, and cheekbone. In the recognition tasks the distractors were randomly inter-mixed with the target faces. The distractors were presented bearing the same expressions as the target slide (untransformed) or bearing a different expression (transformed) from the target slide. Subjects were instructed to report on a scale of 1 to 5 (1 being least confident) whether they had or had not seen the face in the previous tasks. Processing strategy (affective and structural) did not affect recognition accuracy. Results indicate that subjects were better at recognizing untransformed expressions than transformed expression of faces. Parkin and Goodwin addressed the failure to obtain differences in recognition accuracy following affective and structural processing strategies as the "law of parsimony", the same memorial process underlies performance in both processing conditions.

The theory that subjects may direct their attention to different dimensions of the face was examined by Ellis, Deregowski, and Shepherd (1975). Ellis et al compared Black Africans and White Scottish subjects in recognition of Black and White faces. Subjects were required to give a verbal description of each face by imagining that a friend was arriving at a nearby station and that they were not able to meet him or her. Another person, who did not know the friend would pick him or her up and the subject needed to

give a description of the friend. Results showed that Blacks mentioned more features than Whites. Also, Black faces received the greater number of features for both groups of subjects. Whites used the features of eye color, hair color, and hair texture, whereas Black subjects used different aspects of faces: hair position, eye-size, eyebrows, ears, and chin. Ellis et al. suggest that such cross-cultural differences in attention to facial features are due to a learning process in which we acquire a strategy for analyzing the classes of faces to which we are frequently exposed.

Based on the findings of Ellis et al., it is assumed that we acquire a strategy for analyzing the classes of faces which we frequently encounter. That is, White subjects pay attention to certain highly discriminating features of White faces which Black subjects largely ignore. Black subjects process a greater number of discriminating features for Black faces than White subjects. If, in fact, we analyze classes of faces to which we are frequently exposed, it may be possible to direct subject's attention to appropriate cues for discriminating other-race faces and that may increase cross-racial facial identification. The present study examined the cross-race bias effect by using the three types of elaboration: Black-Oriented, White-Oriented, and Attitude-Oriented. The present study varied elaboration by trying to focus attention on different facial feature cues. The elaboration procedure was used to direct cross-racial identification. Therefore, this study used Black-Oriented and White-Oriented instructions which focused only on looking at the cues used by one race. It was assumed that own-race recognition is well established and the study of elaboration instructions would not affect this process. In the "Black-Oriented" Instruction condition the participant's attention was directed to facial features most often used by Black people to discriminate members of their own-race. For instance, for Black faces the

following three appropriate facial dimensions were used: eye size (round-narrow), nose width (broad-narrow), and lips (thick-thin). In the "White-Oriented" Instruction condition participants' attention was directed to the facial dimensions most often used by White people to identify faces of their own race. These features were based on the findings of Ellis et al. (1975) and Shepherd and Deregowski (1981). For instance, in the White-Oriented condition Black faces were rated on the following inappropriate dimensions: eye color (light-dark), hair color (light-dark), and hair texture (straight-tight curls). Participants in the Attitude-Oriented condition rated faces on different personality dimensions (intelligent-unintelligent, friendly-unfriendly, and honest-dishonest). Also, the effect of gender of stimulus face was examined. The degree of interracial contact was determined to examine the possible impact of contact.

In agreement with past research an own-race bias effect was expected. It was hypothesized that directing participants' attention to the "correct" dimensions would result in a reduced or eliminated cross-race bias effect. If recognition failures of other-race faces are due to attention to the wrong or inappropriate dimensions, directing subjects to the appropriate dimension should diminish the effect of own-race bias. Therefore, participants with appropriate other-race instructions would be expected to perform better on the identification of other-race faces than participants with inappropriate other-race instructions or attitude instructions. It also was hypothesized that participants who reported greater amounts of interracial contact would perform better on recognition of other race faces than participants who reported little interracial contact.

METHOD

PARTICIPANTS

Forty-five Black and forty-five White males and females served as participants. Ages ranged from 18 to 32 years. Participants were recruited from the Old Dominion University undergraduate psychology subject pool. Participants received extra credit for their participation.

MATERIALS

Photographs of 40 Black and 40 White individuals were selected from magazines and newspapers. The pictures of faces were cropped to minimize background and other distinctive cues (eg. jewelry). The pictures were converted into color slides. Twenty-four target slides (12 Black and 12 White) were randomly selected from the 80 slides.

DESIGN

The present study used a 3 x 2 x 2 x 2 design, with levels of elaboration, race of participant, race of face, and gender of face. Levels of elaboration and subject variables are between variables.

PROCEDURE

A maximum of six participants at a time were tested in a quiet laboratory room. Participants were seated in front of the screen on which the slides were projected. Participants were randomly assigned to the "Black-Oriented" Elaboration condition, the "White-Oriented" Elaboration condition, or the "Attitude-Oriented" Elaboration condition. At the beginning of each session the subjects were read a brief description of the study and the experimenter answered any questions. The participants completed an informed consent form (see Appendix A). Next, participants were shown a series of 24

slides and were instructed to rate each face on the dimensions given by the experimenter (see Appendix B). Six slides were from each of the 4 experimental cells based on the combination of race and sex. During the first set of target faces the subjects were given 15 seconds to record their response to each face using the group appropriate Elaboration Response Form (see Appendix C). After the presentation of the target slides, participants completed an Interracial Contact Form (see Appendix D) derived from the study of Ng and Lindsay (1994) and Brigham and Barkowitz (1978). Items included listing the racial backgrounds of closest friends and rating the frequency of interactions with males and females of another race (playing games, movie attendance, and studying together). Participants reported current day to day interracial contacts (stores, place of residence, on campus) on a 5 point scale ranging from 1 (no contact) to 5 (extensive contact). Five minutes were allotted for this process.

After the completion of the Interracial Contact Form, participants were presented 40 Black faces and 40 White faces with no more than three slides of the same race being presented in a sequence. The final set of 80 slides was shown which included the original 24 slides and 56 distractor slides. Order of presentation was random. Participants completed a recognition task in which they were instructed to identify the target slides among the set of distractor slides. Each slide was shown for 10 seconds. Participants responded "yes" if they had seen the slide before and "no" if they had not seen the slide before. The participants also indicated on a 5-point likert scale how confident they were with their decision (1= not at all confident, 5= very confident). At the conclusion of the experiment the participants were debriefed.

RESULTS

Due to the small number of male subjects in some design cells (from 2-8 participants), the variable of subject sex was collapsed for this analysis. The design for analysis was a 3 (instruction: Attitude-Oriented, Black-Oriented, White-Oriented) x 2 (Race of Participant) x 2 (Race of Stimulus Face) x 2 (Sex of Stimulus Face) and was analyzed using a mixed design ANOVA (see Table 1). Instruction, and Race of Participant were between-subject variables and the other experimental variables were within-subject variables. Cell sizes raged from 6 to 12, and for that reason we collapsed gender of participant. All significant interactions were analyzed using the Tukey Honestly Significant Difference Test. An alpha level of .05 was used for all statistical tests. Each participant's score was calculated by totaling the number of hits (target slides correctly identified) and the number of false alarms (distractor slides incorrectly identified as being target slides). An index of recognition ability, d', derived from the Signal Detection Theory, was calculated to determine whether own-race bias existed. d prime is described as a measure of discriminability using the proportion of correct identifications and proportion of false alarms (Brigham & Barkowitz, 1978).

d'

Significant main effects were found for Race of Stimulus Face, $F(1, 84) = 37.21$, $p<.001$, and Sex of Stimulus Face, $F(1, 84) = 6.28$, $p<.05$ (see Table 1). White stimulus faces ($M = 1.63$, $SD = .82$) were recognized correctly more often than Black faces ($M = 1.17$, $SD = .71$), and male stimulus faces ($M = 1.48$, $SD = .87$) were recognized better than female stimulus faces ($M = 1.32$, $SD = .71$). The main effect of Groups was not significant, $F(2, 84) = 1.93$, $p=.15$.

Table 1

Analysis of Variance of d' Scores

Sources	df	MS	F	p
GROUP [GRP]	2	1.73	1.93	.15
SSN(GRP*RACE)	84	.90		
RACE OF STIMULUS FACE [ROF]	1	.15	.17	.69
SSN(GRP*RACE)	84	.90		
ROF	1	18.63	37.21	.0001
SSN(GRP*RACE)	84	.90		
SEX OF STIMULUS FACE [SOF]	1	2.32	2.32	.01
SSN*SOF(GRP*RACE)	84	.37		
GRP*RACE	2	1.73	1.93	.15
SSN(GRP*RACE)	84	.90		
GRP*ROF	2	1.92	3.85	.02
SS*ROF(GRP*RACE)	84	.50		
RACE*ROF	1	1.79	3.58	.06
SS*ROF(GRP*RACE)	84	.50		
GRP*SOF	2	.32	.87	.42
SS*SOF(GRP*RACE)	84	.37		
RACE*SOF	1	2.70	7.32	.008
SS*SOF(GRP*RACE)	84	.37		
GRP*RACE*SOF	2	0	0.00	1.0
SS*SOF(GRP*RACE)	84	.37		
ROF*SOF	1	2.08	4.47	.04
SS*ROF*SOF(GRP*RACE)	84	.47		
GRP*ROF*SOF	2	.25	.55	.58
SS*ROF*SOF(GRP*RACE)	84	.47		
GRP*RACE*ROF	2	.18	.35	.70
SS*ROF*SOF(GRP*RC)	84	.50		

Table 1 Continued

Sources	df	MS	F	p
RACE*ROF*SOF	1	.12	.27	.61
SS*ROF*SOF(GRP*RC)	84	.47		
GRP*RACE*ROF*SOF	2	.33	.71	.50
SS*ROF*SOF(GRP*RC)	84	.47		

Although the pattern was not significant, there was a trend for participants in the Attitude-Oriented group to perform better on the recognition task than the other groups (M = 1.56, SD = .82); (M = 1.35, SD = .81, Black-Oriented); (M = 1.33, SD = .75, White Oriented). The main effect for Race of Participant also was not significant, F (1, 84) = .17, p=.68. White and Black participants performed equally well on the recognition task.

Table 2 presents d' means and standard deviations for the interaction of Group with Face Race, $F(1, 84) = 3.85$, $p < .05$. The HSD analysis examined the differences among the conditions for this interaction. Participants in the Attitude-Oriented condition performed better on the recognition task for White faces than for Black faces. Participants in the Black-Oriented Instruction condition also performed better on recognition task when they were shown White faces than when they were shown Black faces. In the White-Oriented Instruction condition, however, there was no significant difference in facial recognition.

Table 3 presents the d' means and standard deviations for the interaction of Race of Participant with Race of Stimulus Face. A marginal significance was found for this interaction, $F(1, 84) = 3.58$, $p = .06$. Whites performed significantly better on White faces than Black faces. Surprisingly, Blacks also performed better on White faces than Black faces although the d' difference appeared smaller .32 for Black participants versus .60 for the White participants. The HSD reveals that difference in discriminability between the race of the stimulus face for the Black participants was significant at the $p<.05$ level, whereas the same comparison for the White participants was at the $p<.01$ level. Essentially, both groups had a better White discriminability score, but the White participants showed a greater disparity in the recognition of Black faces.

Table 2

The Interaction of Group with Race of Stimulus Face: Means and Standard Deviations

Face Race:	**Black**		**White**	**Row Means**
Group:				
Attitude	1.24 (.66)	<	1.88 (.85)*	1.56 (.82)
Black Instr	1.05 (.74)	<	1.64 (.78)*	1.35 (.81)
White Instr	1.24 (.71)	=	1.42 (.82)	1.33 (.75)
Column Means	1.17 (.71)		1.63 (.82)	

*$p < .05$

Table 3

The Interaction of Race of Participant with Race of Stimulus Face: Means and Standard Deviations

Face Race:	**Black**	**White**	**Row Means**
Race of Participant:			
Black	1.22 (.63)	< 1.54 (.86)*	1.38 (.77)
White	1.12 (.78)	< 1.72 (.77)*	1.42 (.83)
Column Means	1.17 (.71)	1.63 (.82)	

* $p < .05$

The d' means and standard deviations for the interaction of race and face sex are presented in Table 4. The interaction of Race of Stimulus Face and Sex of Stimulus Face was significant for d', $F(1, 84) = 7.32$, $p < .05$. White participants were significantly better at recognizing male faces than Blacks who showed no difference as a function of face sex. Overall, males were more often correctly recognized than females.

Finally, the interaction of Race of Stimulus Face with Sex of Stimulus Face was significant for d', $F(1, 84) = 4.47$, $p < .05$ (see Table 5). There was no difference in the recognition of Black male and Black female faces. White males, however, were recognized more frequently than White females. Overall, White males were recognized significantly better than Black males, Black females, and White females. All other interactions terms were nonsignificant.

Interracial Contact

Both Whites and Blacks reported greater associations with members of their own race "as their closest friends" (see Table 6). A Chi-square analysis, $(4) = 53.95$, $p < .05$, of this frequency table indicated a significant difference among the cells. Findings indicate that 85% of Black participants report that their closest friends are Black, while 75% of White participants report that their closest friends are White (own-race).

Also, interracial contact was measured across three factors, the amount of contact with the other race playing games, going to movies, and studying. Correlations were computed between these ratings of contact and the d' scores. Also, correlations for Black and White subjects were computed separately to examine this effect.

Table 4

Interaction of Race of Participant with Sex of Stimulus Face: Means and Standard Deviations

Face Sex:	**Female**		**Male**	**Row Means**
Race of Participant:				
Black	1.38 (.71)	=	1.37 (.83)	1.38 (.77)
White	1.25 (.71)	<	1.58 (.91)*	1.42 (.81)
Column Means	1.32 (.71)		1.48 (.87)	

* $p < .05$

Table 5

Interaction of Race of Stimulus Face with Sex of Stimulus Face: Means and Standard Deviations

Face Sex:	**Female**		**Male**	**Row Means**
Race of Stimulus Face:				
Black	1.17 (.66)	=	1.18 (.75)	1.17 (.71)
White	1.47 (.73)	<	1.78 (.88)*	1.63 (.82)
Column Means	1.32 (.71)		1.48 (.87)	

* $p < .05$

Table 6

Reported Frequency of Race of Closest Friend

	BLACK	ASIAN	HISPANIC	WHITE	OTHER
BLACK	39	0	0	4	2
WHITE	5	3	1	34	2

Correlations between the three contact measures and participants' recognition ranged from -.07 to .11 for Black participants, and -.21 to .30 for White participants (see Tables 7 & 8, respectively). There were no significant correlations between the three contact measures and recognition for Black participants. There was only one significant correlation found for the correlation between the three contact measures and recognition for White participants, White female discriminablity, .30. The more contact White participants had with another race studying together the better their recognition of White females. According to alpha error, five percent, or 1 out of 20 can be significantly due to chance. The significant correlation occurred 1 out of 24, and is considered to be due to the chance effect.

Table 7

The Amount of Other Race Contact that is Related to the d' Scores as a Function of Stimulus Face for Black Participants

Interracial Contact	Plays	Movies	Study
White Female	-.07	.11	.06
White Male	.01	.05	.02
Black Female	.16	.22	.18
Black Male	.17	.07	-.17

Table 8

The Amount of Other Race Contact that is Related to the d' Scores as a Function of Stimulus Face for White Participants

Interracial Contact	Plays	Movies	Study
White Female	.17	.15	.30*
White Male	-.05	.21	.06
Black Female	-.21	.01	.08
Black Male	.09	-.11	.03

* $p < .05$

CONCLUSION

The primary finding was a cross-racial bias for White participants and a pattern of White recognition superiority for Black participants. The results are consistent with some findings of earlier studies. These results closely resemble the findings of Malpass and Kravitz (1969) and Barkowitz and Brigham (1982). According to these studies, pictures of Whites were recognized better than pictures of Blacks. White stimuli were reported as being more easily recognizable which allowed for better recognition of White faces than Black faces. White faces also may have yielded better recognition because of the Heterogeneity Hypothesis. According to Anthony et al. (1992) larger groups (Whites) are perceived as more heterogeneous than small groups (Blacks).

Participants' recognition performance may have been better for White faces than Black faces because of the context of the current sample. The present study was conducted at a predominately White university where Whites are the larger group, and Blacks are the smaller group. Students at the university are exposed to more White faces than Black faces. Over 60 % of the student population is White, whereas approximately 20% of the student body is Black. Black students are a clear minority. They are required to remember White faces because the professors, administrators, and staff are predominantly White. Including a sample from a predominately Black university, may have provided results that reveal a cross-racial bias for Black participants as well.

Another reason why white stimulus faces for the present study were more easily recognizable may have been due to the specific nature of the facial stimuli. The white stimuli used for the design may simply have been more distinctive than the black stimuli. The Black faces used in the study may have been more similar than the White faces. For

example, many of the Black faces used in the study had dark skin and dark colored eyes, whereas the white stimuli included faces that varied in hair color and eye color. Pretesting procedures which require the examinee to compare facial features of the target stimuli to determine the similarity of the faces of the same race and gender may be beneficial. Requiring participants to rate faces on similarity, attractiveness, and distinctiveness can aid in the selection of target faces and distractor faces.

The results did not support the hypothesis that directing attention to appropriate discriminative cues for other-race faces would increase cross-racial identification. According to Lindsay et al. (1991), the Race-Specific Hypothesis states that people develop specialized expertise at processing faces of their own race. One condition of the present study did not support this hypothesis. Black participants in the Black-Oriented Instructions condition performed better on White faces. In this one condition this finding could have occurred by chance. This finding also suggests that White stimuli may have been more easily recognizable than Black stimuli.

There also is some indication that a cross-group facial identification effect existed for White subjects. This is consistent with Anthony et al. (1992). Subjects may exhibit superior memory for faces of their own race because of a specific operationalization tendency to fail to distinguish members of the out-group.

Specifically, there was a trend for participants in the Attitude-Oriented condition to perform better on the recognition tasks than participants in the Black-Oriented and White-Oriented Instructions condition. Participants instructed to rate faces on personality traits or attitude (intelligence, friendliness, honesty) had better recognition performance. The results, however, provide some support for past research on the personality

dimension. Shapiro and Penrod (1986) found recognition performance to be better for participants when they judged faces along personality dimensions (pleasant, intelligent, honest) than when they judged faces on physical aspects. The Black-Oriented Instructions condition and the White-Oriented Instructions condition seemed to decrease participants recognition performance. The instructions may have confused participants. This directed rating of specific dimensions may not have provided adequate training and may be inconsistent with the automatic processes we use to remember faces. Support for this trend was found in the present study. Recognition performance was poorer for the White-Oriented and Black-Oriented Instructions condition than for the Attitude-Oriented condition. If participants were given more time to complete elaboration training their recognition of other- race faces may have been better.

Stimulus gender had an effect on facial recognition. Male faces were recognized more easily than female faces. Blacks, however, failed to show any recognition difference between male and female faces, whereas Whites recognized males better than females. Overall, White males were recognized better than any other group. The nature of the stimuli may have affected participants recognition. White male faces may have been more distinctive than the other groups.

Participants were more likely to have a friend of the same race than a friend of another race. This was especially true of their closest friends, 85% of Blacks reported members of their own race as their closest friends; while 75% of Whites also reported higher same race association. However, interaction or contact during play, movie attendance, and studying was not related to facial recognition. Ng and Lindsay (1991) found similar results. Both Eastern Asians and Whites reported greater interaction with

their own race than with another race, however, there was no effect on facial recognition. Contact may not have affected facial recognition because of the scale used to measure the amount of contact one has with members of another race. A more effective Interracial Scale may require subjects to report amounts of interaction with other races in different types of activities other than play, studying, and movie attendance. Also, using Black participants from a predominantly Black university and White participants from a predominantly White university may yield significant results for contact. Both participants would be expected to have a small amount of interracial contact.

For future research on cross-racial identification it may be helpful if exit interviews are conducted. This would allow questions such as, "Was there anything confusing about the experiment?", "Was anything hard to understand?", "How did you remember the faces?, or "What would you have done differently if you were the experimenter?". Pre-testing also may help in the area of elaboration training and similarity of faces. Although, questions of why own-race bias exists continue to arise the present study has provided new information in the area of cross-racial identification.

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APPENDIX A

INFORMED CONSENT

I have been informed that this study is designed to examine recognition of Black and White faces. The details have been explained to me. As a participant, I will complete the entire experiment. I understand that no information or results on individual participants will be available, and the final results will be presented only as summary data. I have been informed that my participation is completely voluntary and I can terminate my participation at any time without consequence.

Having read and understood the previous paragraph, I agree to participate in the present project.

_____ _____

Participant's Signature Date

APPENDIX B

INSTRUCTIONS

Part I

Hello and welcome to Project FACES. My name is Tonika Duren and I am the experimenter for the study. This project is interested in the dimensions people use to categorize faces. Psychologists have not determined the characteristics of faces that make them important, memorable or distinctive. The objective of this research is to begin to explore this area.

STOP

(Pass out Informed Consent Form)

Please listen carefully to the set of instructions that I am about to read to you. After I have finished reading the instructions you may ask questions if you do not understand. In the first part of the experiment you will be shown a total of 24 faces and will be asked to rate them on these three dimensions:

Affective

Group A 1)intelligence 2)friendliness 3)honesty

Appropriate

Group B 1)eye size 2)nose width 3)lips 1

Inappropriate

Group C 1)eye color 2)hair color 3)hair texture

Each face will be projected on the screen in front of you for 10 seconds. During the presentation of each face you will record your response on the scan-tron sheet.

STOP

(Explain how to record the responses on the scan-tron)

Scan-Tron Instructions

You will rate the faces on 3 dimensions. D1 is (eye size) D2 (nose width) D3 (lips). You will start with number 1 and rate the face on the three dimensions going across. Then you will move to face 2 and rate that on the three dimensions going across. You will stop at face 24 and it tells you where to stop on the back. Do you have any questions?

Do you have any questions before you begin?

Part II

You have completed the first part of the experiment. Now let's move on to part II of the experiment. You will be given 5 minutes to complete a short informational survey. Please record you responses on the sheet.

STOP -----PASS OUT INTERRACIAL CONTACT FORM

Any questions? You may begin.

Part III

This is the final part of the experiment. You will be shown a set of 80 slides. It is your task to decide whether you have or have not seen the face before in the first set of faces you were shown. If you think you have saw the face before mark "A" on your scan-tron sheet, if you did not see the face before mark "B" on your scan-tron sheet. After you have marked your answer rate your confidence in this judgment on a scale of 1 to 5. A confidence rating of 1 would mean that you are not at all confident that of you decision. A rating of 5 would mean that you are "very confident" of your decision. It is important that you respond to each face.

Do you have any questions before you begin?

THANK YOU FOR PARTICIPATING IN PROJECT FACES!

APPENDIX C

Elaboration Response Form
BLACK-ORIENTED

Please use the scan-tron sheet to rate each face on the features listed below.

Facial Feature	**Feature Scale**
1) Eye size	1 2 3 4 5 6 7 Very round ... Narrow
2) Nose Width	1 2 3 4 5 6 7 Broad ... Narrow
3) Lips	1 2 3 4 5 6 7 thick ... thin

Elaboration Response Form
WHITE-ORIENTED

Please use the scan-tron sheet to rate each face on the features listed below.

Facial Feature	**Feature Scale**
1) Eye color	1 2 3 4 5 6 7 light dark
2) Hair color	1 2 3 4 5 6 7 light dark
3) Hair texture	1 2 3 4 5 6 7 straight tight curls

Elaboration Response Form
ATTITUDE-ORIENTED

Please use the scan-tron sheet to rate each face on the personality features listed below.

Personality Feature	**Feature Scale**
1) Intelligence	1 2 3 4 5 6 7 unintelligent very intelligent
2) Friendliness	1 2 3 4 5 6 7 unfriendly very friendly
3) Honesty	1 2 3 4 5 6 7 dishonest honest

APPENDIX D

Interracial Contact Form

1) Sex
1-Female
2-Male

2) Age

4) Race
1-African-American
2-Asian
3-Hispanic
4-White
5-Other

4) What is the racial background of your closest friends?
1-African-American
2-Asian
3-Hispanic
4-White
5-Other

5) State your frequency of contact with males and females of another race during the following activities.

1=no contact
2=very little contact
3=some contact
4=frequent contact
5=extensive contact

1)Playing Games	1	2	3	4	5
2)Movie Attendance	1	2	3	4	5
3)Studying Together	1	2	3	4	5

VITA

BIOGRAPHICAL INFORMATION: **Tonika Duren**

EDUCATIONAL AND CAREER OBJECTIVES: To obtain a doctorate degree in School Psychology, with a subspecialization in Multicultural Counseling. I am interested in consultation, assessment and intervention. My career goal is centered on becoming employed in a university, providing training for school psychologists of the future.

EDUCATION:

Indiana State University, Terre Haute, Indiana
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HONORS AND AWARDS: Perfect Scholar, Recipient of Graduate Fellowship, Outstanding Minority Award (Graduating with 3.0 or higher), All American Scholar, Recipient of Indiana State University Minority Fellowship, Honor for outstanding academic achievement from Indiana Coalition of Blacks in Higher Education (ICBHE).

RESEARCH AND CLINICAL EXPERIENCE: Served as research assistant for two terms for Dr. Patricia Clark-Nichols, former professor of psychology at Old Dominion University. Served as research assistant for one year for Dr. Janis Sanchez-Hucles. Graduate teaching assistantship-presently teaching a course in Multicultural Education; Teaching assistanship-Individual Assessment of Intelligence (Graduate course). Facilitator of Cognitive and Assessment Skills Training Group (CAST) for children with symptoms of Attention Deficit-Hyperactivity Disorder.