— Hug + B '03 + study +

(10) A1/ or B/2: ran/eth, pg 640

(11) avg (2), pg 641,

(12) dff (1), pg 641

(13) dff (1), pg 641

(14) not obs (0), pg 641

(15) ~~obs~~ sdt-rep (4), pg 641

(16) wit rep (3), pg 642

(17) words (0), pg 641

(18) one (1), pg 641

(19) 3rd (3) I, pg 641

(20) 2nd (2) E

(21) 1st (1) B

(22) after (2)

(23) afte (2)

(24) same (0)

(25) sam (0)

(26) sd-(7), pg 641

(27) sd-(7), , pg 641

(28) con-(6), pg 641

(29) spec-(3), pg 641

(30) spu-(3), pg 641

(31) (9.5), pg 641

(32) ~~Non (0)~~ ran (1)

(33) dud (2), pg 641

dff: called before, ~~not~~ obs (0)

dff-before, ~~dff-rep~~ (4)

2

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Hug & B, '03, study 2

(10b) A1 or B/2 – roulette, pg 640

(11b) same, pg 642

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# Research Report

## FACING PREJUDICE: Implicit Prejudice and the Perception of Facial Threat

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**Abstract**—*We propose that social attitudes, and in particular implicit prejudice, bias people's perceptions of the facial emotion displayed by others. To test this hypothesis, we employed a facial emotion change-detection task in which European American participants detected the offset (Study 1) or onset (Study 2) of facial anger in both Black and White targets. Higher implicit (but not explicit) prejudice was associated with a greater readiness to perceive anger in Black faces, but neither explicit nor implicit prejudice predicted anger perceptions regarding similar White faces. This pattern indicates that European Americans high in implicit racial prejudice are biased to perceive threatening affect in Black but not White faces, suggesting that the deleterious effects of stereotypes may take hold extremely early in social interaction.*

The human face is central to social interaction and thus is of primary importance in social perception. Considering the inherently social nature of face perception, surprisingly little research has investigated the influence of social attitudes on the decoding of facial affect. Stereotypes clearly influence how people interpret the behavior of others. For instance, Duncan (1976) showed that ambiguous behavior was interpreted more negatively when performed by a Black actor than when it was performed by a White actor. Similarly, Sagar and Schofield (1980) found that ambiguously hostile behaviors were rated as more hostile when performed by a Black rather than White actor. Thus, cultural stereotypes tend to bias interpretations of ambiguous behaviors of Black targets in a negative manner.

Given these biases in behavioral interpretation, one might expect that stereotypes would also influence the interpretation of facial affect. Whereas most research involving facial affect has used unambiguously emotional faces (e.g., Ekman, Sorenson, & Friesen, 1969), such facial expressions are rarely observable in everyday interaction (Wehrle & Kaiser, 2000). Instead, people typically decode somewhat ambiguous facial displays requiring at least a modicum of interpretation. Given that stereotypes are quite powerful in ambiguous situations (e.g., Bodenhausen & Macrae, 1998), disambiguating an ambiguous facial display is not only a common occurrence, but also one in which stereotypes may have a potent influence.

The research we report here tested the hypothesis that stereotypes influence perceptions of facial affect. We hypothesized that ambiguously hostile Black faces would be perceived as more hostile than similar White faces, which would be consistent with the cultural stereotype of African Americans as aggressive (Devine, 1989). Although most individuals know the content of this stereotype, high-prejudice individuals are more likely than others to activate and apply such stereotypic content (Lepore & Brown, 1997). Thus, if stereotypes play a role in decoding facial affect, this role will likely be most powerful for those individuals who are relatively high in prejudice. Specifically, we hypothesized that high-prejudice European Americans would interpret the facial affect of African Americans as more hostile than their low-prejudice counterparts would. However, this bias might be evident only when attitudes were assessed using implicit measures. Traditional, explicit measures may fail to capture subtle or automatic attitudinal biases of which people may be largely unaware. Implicit measures, based on differences in reaction times to attitude-relevant stimuli, may better capture the aspects of prejudiced attitudes that are most relevant in the rapid parsing of nonverbal displays (e.g., Dovidio, Kawakami, & Gaertner, 2002).

Most experiments on face perception use still photographs as stimuli, despite the dynamic nature of facial displays in real-life interactions. Indeed, the way a face changes over the course of an expression can provide as much information about emotion as does the end state (e.g., Wehrle & Kaiser, 2000). For example, fear and surprise are frequently confused when only the end-state expression is displayed. To disambiguate such displays, perceivers need to see not only the final expression but also how and when the face changed to the end state. Thus, in the present study, we employed dynamic facial displays and investigated perceptions of changes in emotional displays.

### STUDY 1

Study 1 employed a method similar to that used in a study by Niedenthal, Halberstadt, Margolin, and Innes-Ker (2000), in which participants watched computer-based faces morph from one facial expression to another. We constructed brief movie clips in which the targets' facial expressions morphed from unambiguous hostility to unambiguous happiness. Participants watched four such movies and indicated when the initial hostile expression offset (i.e., was no longer perceptible). Participants then completed measures of their explicit attitudes toward Caucasians and African Americans and finally completed an implicit association task (IAT; see Greenwald, McGhee, & Schwartz, 1998) designed to measure implicit racial attitudes.

Because of the nature of changing facial displays, there was a substantial period in each movie in which the target's expression was ambiguous, somewhere between hostile and friendly. We predicted that as prejudice increased, so would the tendency to decode Black targets' ambiguous expressions as hostile. That is, compared with low-prejudice European Americans, high-prejudice European Americans would perceive an angry expression on a Black face as lingering for longer, and consequently would have longer response latencies. However, we expected prejudice to be unrelated to perceptions of anger in White faces.

#### Method

##### *Participants and design*

Twenty-four European-American university students (14 female) participated in this study. Both implicit and explicit measures of preju-

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dice served as predictors of hostility offset in White and Black targets; target race was manipulated on a within-subjects basis.

*Materials and procedure*

Stimuli consisted of faces generated using the Poser 4™ three-dimensional character animation software, which afforded control over each target's facial structure, expression, skin tone, and hair style and color, permitting Black and White target faces to be matched precisely for both facial structure and expression. This matching ensured that differences in the facial physiognomy of Black and White targets did not influence the way an expression was displayed. Additionally it allowed us to rule out the possibility that particular facial features are evaluatively laden (Livingston & Brewer, 2002), while ensuring a similar level of facial attractiveness.

We used the Poser 4™ software to create movies in which each target's facial expression changed over time. We created four such movies, using two different facial structures, each with both a White and a Black target (see Fig. 1). All facial structures were intentionally constructed as ethnically ambiguous, and target ethnicity was manipulated by changing the targets' skin tone, hairstyle, and hair color. In pretests, both the Black and the White versions of the target faces were readily identified as plausible exemplars of their respective categories. Additionally, the initial hostile expressions of the Black and White faces were rated as equally hostile and substantially more hostile than the end-point happy expressions, regardless of raters' levels of implicit or explicit prejudice. In order to establish generality across specific exemplars, we constructed the two base facial structures to display different initial hostile expressions and shift to different displays of happiness. Each movie was 120 frames in length, with a duration of 16 s, and was shown on a computer monitor in an area measuring 12 × 12.5 cm.

After giving informed consent, participants were seated at computers in individual cubicles and instructed to watch each movie and press the space bar when they saw that the target face no longer expressed its initial emotion (cf. Niedenthal et al., 2000). They performed one practice trial and then engaged in the emotion offset task. The order of the four target movies (two Black and two White faces) was randomized for each participant. Following the emotion perception task, participants were presented with "feeling thermometers" about five different social groups, including Caucasians and African Americans. Participants indicated how warmly or coldly they felt about each group on a scale from 1 to 100, with higher responses indicating more warmth.

Finally, participants performed the IAT, which was described as an ostensibly unrelated word categorization task. The IAT consisted of five trial blocks. The first two blocks were practice blocks in which participants learned to map White names to one response key and Black names to another (the first block) and to map pleasant and unpleasant words to those same response keys (the second block). The selected names and words were taken from Greenwald et al. (1998). A third block involved the *compatible* trials, on which White names and pleasant words were mapped to the same response key and Black names and unpleasant words were both mapped to another key. After a fourth block of learning a new mapping for the pleasant and unpleasant words, the fifth block consisted of *incompatible* trials, on which White names and unpleasant words were mapped to the same key and Black names and pleasant words were both mapped to another key. On the IAT, implicit prejudice is indicated by the extent to which performance on the incompatible trials (i.e., Black-good/White-bad) is impaired, relative to performance on the compatible trials (i.e., Black-bad/White-good). After completing all tasks, participants were debriefed.

## Results and Discussion

The main dependent measure was the mean time taken by participants to detect the offset of hostility; longer response latencies indicated lingering perceptions of anger in a particular face. We hypothesized that high-prejudice European Americans would take longer than their

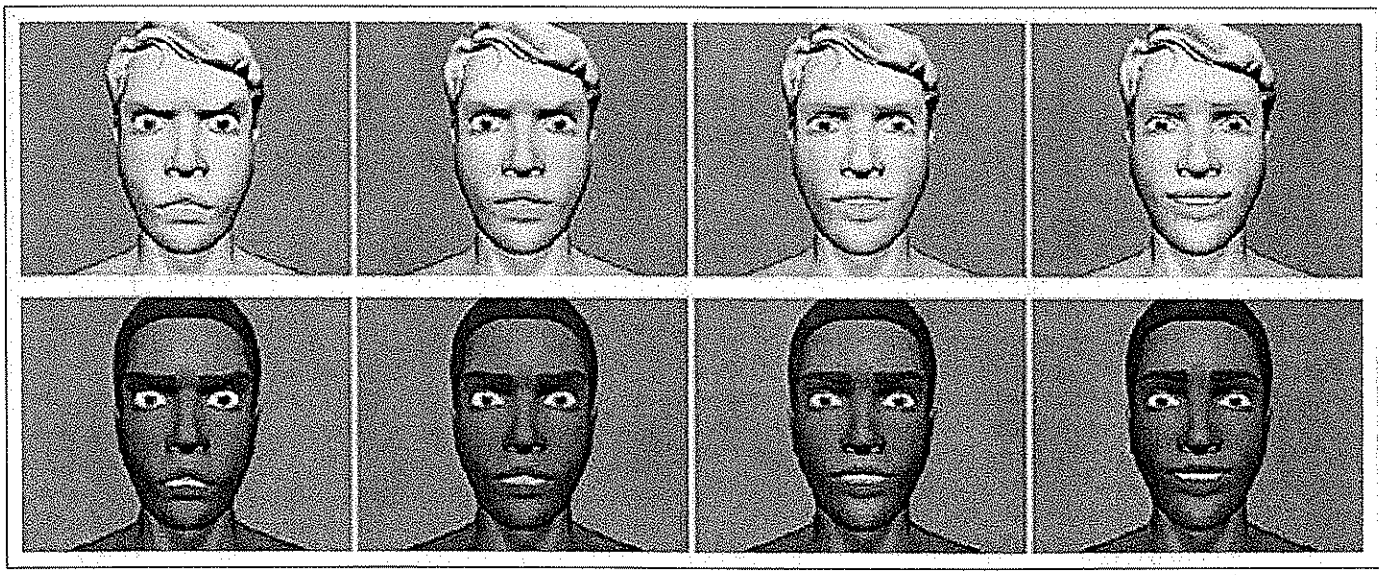

**Fig. 1.** Four frames of one angry-to-happy movie with the White (top) and Black (bottom) target faces. The figure shows gray-scale reproductions of the original color images.

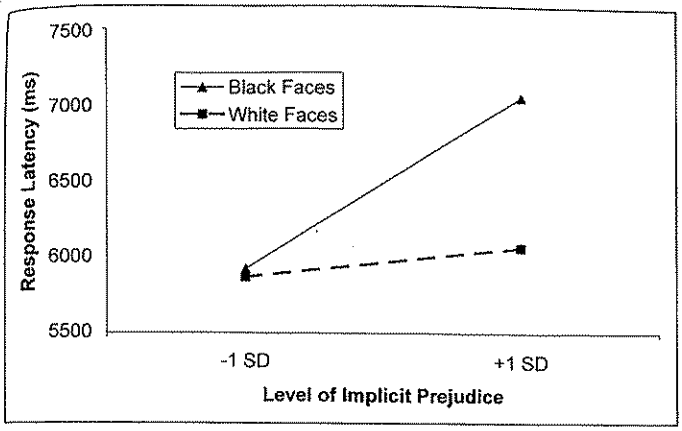


**Fig. 2.** Regression of mean response latency for hostility offset on level of implicit prejudice in Study 1. Results are shown separately for Black and White target faces. Plotted values of implicit prejudice are 1 *SD* above and below the mean score on the Implicit Association Test.

low-prejudice counterparts to respond to Black (but not White) faces changing from hostile to friendly expressions.

To test these hypotheses, we computed centered values of implicit prejudice by subtracting each participant's mean latency for compatible trials ($M$ = 808 ms, $SD$ = 191) from that participant's mean latency for incompatible trials ($M$ = 1,028 ms, $SD$ = 228), following the conventions used by Greenwald et al. (1998). We employed a multiple regression analysis wherein implicit prejudice, explicit prejudice ($M$ = 1.8, $SD$ = 21.5),[1] and their interaction term were used to predict response latencies to both Black and White faces, with race of target face as a within-subjects factor (i.e., treating the difference in response latencies to the Black and White faces as the criterion variable). This analysis revealed the hypothesized Implicit Prejudice × Target Ethnicity interaction, $F(1, 20) = 4.77$, $p = .041$ (see Fig. 2). Neither explicit prejudice nor its interaction with implicit prejudice predicted any significant variance in the latency of responses to the face stimuli, $ps > .25$.

As predicted, simple slope tests revealed that implicit-prejudice scores were positively related to response times for Black faces, standardized $\beta = .46$, $F(1, 22) = 5.92$, $p = .024$; participants higher in implicit prejudice indicated that hostility offset occurred later for Black faces than did lower-prejudice participants. However, implicit prejudice was unrelated to response times for White faces, standardized $\beta = .09$, $F(1, 22) = 0.20$, n.s.

## STUDY 2

The first study showed that anger was perceived to linger longer in Black faces to the extent that viewers possessed greater levels of implicit prejudice. However, it might be the case that slower response times were a result of greater indecision or inhibited perceptual processing of Black faces among more prejudiced persons (see von Hippel, Sekaquaptewa, & Vargas, 1995). Therefore, we decided to examine perceptions of anger onset. If the perceptions of high-prejudice respondents are colored by social stereotypes, then compared with low-prejudice respondents, high-prejudice respondents should see anger emerge more quickly on Black faces and therefore respond more quickly to the onset of anger in Black faces; however, if high-prejudice viewers are simply indecisive or do not process Black faces as efficiently as low-prejudice viewers, then high-prejudice viewers should be slower than low-prejudice viewers to respond to Black faces. Thus, in Study 2, we employed a method virtually identical to that of Study 1, except that participants were required to detect the onset of hostility in Black and White faces. If response times of high-prejudice participants were faster than response times of low-prejudice respondents, this would suggest that the results of Study 1 were due to the influence of social stereotypes in high-prejudice participants. If, however, response times of high-prejudice participants were slower than response times of low-prejudice participants, this would suggest that the results of Study 1 were due to indecision or slower processing among low-prejudice participants.

### Method

#### *Participants and design*

Twenty-four European-American university students (5 female) participated in the study. Both implicit and explicit measures of prejudice served as predictors of latency in responding to hostility onset in White and Black targets; target race was manipulated on a within-subjects basis.

#### *Materials and procedure*

Materials and procedure were identical to those used in Study 1 except that the four stimulus movies were constructed such that target faces morphed from a neutral expression to a hostile expression. Participants were instructed to watch each movie and respond by pressing the space bar when they saw a new expression unambiguously displayed by the target.

### Results and Discussion

The dependent measure was the mean time taken by participants to detect hostility onset. We predicted faster responses to Black (but not White) faces as implicit prejudice increased. A multiple regression analysis analogous to that employed in Study 1 was used to test this hypothesis. As predicted, this analysis confirmed an Implicit Prejudice × Target Ethnicity interaction, $F(1, 20) = 6.10$, $p = .023$ (see Fig. 3). Again, neither explicit prejudice nor its interaction with implicit prejudice was reliably associated with response latencies, $ps > .35$.

Simple slope tests confirmed that implicit-prejudice scores were inversely related to response times for Black faces, standardized $\beta = -.42$, $F(1, 22) = 4.81$, $p = .039$; individuals high in implicit prejudice perceived the onset of hostility much earlier for Black faces than did low-prejudice participants. However, response times for White faces were unrelated to implicit-prejudice scores, standardized $\beta = -.19$, $F(1, 22) = 0.84$, n.s.

1. The IAT is a relative measure of prejudice. In order to make the explicit measure of prejudice analogous, we subtracted the feeling-thermometer score for African Americans from that for Caucasians to obtain a relative measure of explicit prejudice, with higher scores indicating relative preference for Caucasians. (Similar tests performed with the absolute feeling-thermometer scores for African Americans yielded results virtually identical to those reported here.) The correlation between the relative explicit and implicit measures of prejudice was marginally significant, $r(24) = .36$, $p = .084$.