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Exploring implicit ingroup and outgroup bias toward Hispanics

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Abstract

Racial and ethnic biases often manifest without awareness. The underlying causes of these attitudes are not fully understood. While outgroup bias is well studied, ingroup bias has received far less attention. We examined ingroup biases among Hispanic women and outgroup biases toward Hispanics among White (Caucasian non-Hispanic) females using the startle eyeblink paradigm, the Implicit Association Test (IAT), and an explicit self-report measure. Hispanic and White male faces were used as exemplars during both the startle task and the IAT. A similar pattern of results were observed for indirect measures: both groups displayed startle and IAT responses indicative of negative attitudes toward Hispanic male faces relative to White male faces, although less so for Hispanic participants. Combined groups correlational analyses revealed a significant positive relationship between startle eyeblink amplitude and subtle subscale bias scores. However, no relationships were found between any measures when groups were examined separately. The comparable pattern of startle and IAT results suggests that in spite of the likelihood that these measures index different aspects of attitudes and tap into different processes, inter and intragroup biases are manifested similarly. The finding of negative ingroup biases among Hispanic females is consistent with system justification theory, which posits that members of devalued groups internalize negative stereotypes about their ingroup. This study extends startle eyeblink research of intergroup racial biases, while also expanding this line of research to intragroup biases. In doing so, these results add to our knowledge of the mechanisms underlying the persistent nature of stereotypes.

Keywords

Hispanic, Implicit Association Test, implicit attitudes, ingroup bias, outgroup bias, startle eyeblink

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Stereotypes are cognitive associations overlearned after repeated exposure (Devine, 1989), a notion supported by research showing that stereotypes are internalized passively, even in the absence of deliberate intention (e.g., Gregg, Seibt, & Banaji, 2006; Rydell & McConnell, 2006). As a result of repeated exposure, individuals will automatically

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internalize stereotypes about both in- and outgroups. Yet, research has focused primarily on negative biases toward outgroups (ingroup favoritism). Group justification theories supported by this research have become so well established that they are generally accepted as self-evident (Jost, Banaji, & Nosek, 2004). However, inter- and intragroup attitudes are more multifaceted, contextual, and complex than the conventional principles acknowledge (Smith & Mackie, 2002). Jost et al. (2004) have noted that ingroup favoritism should not be considered a default characteristic of intergroup relations, and have challenged the unipolar focus on outgroup derogation, arguing that doing so disregards the presence of negative ingroup bias (outgroup favoritism).

Outgroup favoritism, an evaluative preference for a nonmember group relative to one's member group (Jost, Pelham, & Carvallo, 2002), has gone largely unstudied. This lack of empirical interest in outgroup favoritism may stem from the assumption that most social groups exhibit positive ingroup evaluations (Ashburn-Nardo, Knowles, & Monteith, 2003). The few studies in this area support the presence of outgroup favoritism, primarily through the use of self-report measures (e.g., Jost et al., 2002; Sniderman & Piazza, 1993; Uhlmann, Dasgupta, Elgueta, Greenwald, & Swanson, 2002). However, given that individuals may be reluctant to divulge prejudicial attitudes, the validity of these direct measures is questionable (Guglielmi, 1999). Because of this, indices of implicit bias relying on indirect measures (see Fazio & Olson, 2003, for a review) are appealing, as they index automatic reactions, circumvent the need to ask direct questions, and are less susceptible to response biases (Greenwald, McGhee, & Schwartz, 1998; Guglielmi, 1999).

Research using indirect measures (e.g., the IAT) has demonstrated the presence of outgroup favoritism among diverse groups (e.g., Ashburn-Nardo et al., 2003; Livingston, 2002; Nosek, Banaji, & Greenwald, 2002; Rudman, Feinberg, & Fairchild, 2002), findings which converge with psychophysiological and neuroimaging research (e.g., Chow, Lowery, & Knowles, 2008; Dickter & Bartholow, 2007). However, certain methodologies (e.g., fMRI and EEG) do not provide information about affective valence and cannot confirm the presence of *negative* ingroup bias (outgroup favoritism), limiting their interpretability.

The aim of the current study was to examine in- and outgroup bias towards Hispanics using direct and indirect measures, including the startle paradigm which is sensitive to affective valence. While in- and outgroup bias toward Hispanics has been examined using indirect measures (e.g., the IAT; Uhlmann et al., 2002; Weyant, 2005), to our knowledge, no studies have utilized a psychophysiological measure to examine in- or outgroup bias towards Hispanics. Our primary focus was on determining the presence of outgroup favoritism among Hispanics. Currently, many models of discrimination do not account for the causes and consequences of outgroup favoritism (Jost et al., 2004). Thus, a significant contributor to discrimination is often not accounted for theoretically. Outgroup favoritism is a facet of bias that warrants further exploration, which will inform the development of more comprehensive models of discrimination.

This study examined bias among and toward Hispanics, a group that has been largely overlooked by bias research. Hispanics are the largest and most rapidly growing minority group in the US (U.S. Census Bureau, 2010), and are exposed to persistent visible discrimination (Markert, 2010). In spite of this, a 2010 review of articles from three major social psychology journals revealed that only 7% of published research focused on Hispanics as the targets of bias, while 61% focused on Blacks (Dovidio, Gluszek, John, Ditlmann, & Lagunes, 2010). Moreover, current conceptions of White–Hispanic relations have often grown out of preexisting models of White–Black relations, with a general focus on shared elements that contribute to bias across groups (e.g., intergroup threat). This practice has ignored the underlying dynamics that give rise to discriminatory attitudes unique to each group, and may not fully address the multifaceted nature of discrimination (Dovidio et al., 2010).

Affective responses are an integral component of prejudicial behaviors and attitudes, (Lavine, Thomsen, Zanna, & Borgida, 1998; Stangor, Sullivan, & Ford, 1991), especially negative affect (Guglielmi, 1999). Psychophysiological measures that index amygdala activation (i.e., the startle response) are best suited to tap emotional reactions (Amodio & Lieberman, 2009), and as racial prejudices are emotion based, a startle paradigm is ideal for the study of both in- and outgroup biases. The startle eyeblink reflex is a physiological marker shown to reliably discriminate both affective valence and intensity (Vrana, Spence, & Lang, 1988; also see Bradley, Cuthbert, & Lang, 1999, for a review). With this in mind, the startle paradigm was employed in order to provide insight into affective mechanisms underlying implicit bias toward Hispanics. Startle methodology is well-suited for the examination of bias as it is less amenable to conscious control than measures requiring deliberate responses (Amodio & Mendoza, 2010; Guglielmi, 1999).

Startle response (SR) amplitude is influenced by the interval between stimulus onset and the startle probe. At short interstimulus intervals (ISIs; i.e., < 500 ms), SR amplitudes are thought to reflect attentional modulation, independent of affective valence (Amodio, Harmon-Jones, & Devine, 2003; Bradley, Cuthbert, & Lang, 1993; Panayiotou, Witvliet, Robinson, & Vrana, 2011). At longer ISIs (i.e., > 500 ms), SR amplitudes reflect affective modulation (Amodio et al., 2003; Robinson & Vrana, 2000), indexing motivational state after stimulus evaluation (Lang, Bradley, & Cuthbert, 1990) as well as attentional effects (Vanman, Ryan, Pedersen, & Ito, 2013).

Research utilizing startle paradigms has identified negative affective states associated with racial (Amodio et al., 2003; Brown, Bradley, & Lang, 2006; Phelps et al., 2000; Vanman et al., 2013) and antigay bias (Mahaffey, Bryan, & Hutchinson, 2005). In a study employing Black, White, and Asian neutral face primes, White participants displayed potentiated SRs to Black (vs. White and Asian) face primes after long ISIs (4,000 ms; Amodio et al., 2003). Moreover, there were no significant differences between SRs recorded during White versus Asian primes. Phelps et al. (2000) found a trend toward potentiated SRs among Whites when viewing Black (vs. White) neutral faces, as well as a correlation between SR amplitudes during Black faces and fMRI measured amygdala activation. Additionally, Mahaffey et al. (2005) found startle potentiation to male nude primes among males who expressed homophobic attitudes, but not among participants displaying low or no homophobia. While these studies indicate that the SR is sensitive to negative bias, others suggest that this interpretation may be oversimplified. For example, Brown et al. (2006) found White SR potentiation toward negatively (vs. positively) valenced primes, regardless of race depicted (Black vs. White), and Vanman et al. (2013) actually found SR potentiation among Whites to White (vs. Black) smiling primes. Though, taken together, these studies indicate that the SR is an index of specifically activated affective states; however, its interpretation (e.g., threat detection or other evaluative and/or attentional processes) in the context of in- or outgroup bias remains unclear.

The Implicit Association Test (IAT; Greenwald et al., 1998) measures strength of association by requiring participants to categorize stimuli representing an attitude object. Target and attribute labels are presented simultaneously in evaluatively congruent or incongruent combinations. When target and attribute are evaluatively associated and share the same key response (congruent), responding should be easier (faster) than when the target and attribute are incongruent. The IAT is one of the most widely used indirect measures in studies of racial/ethnic bias, and has consistently demonstrated negative bias toward devalued groups (e.g., overweight: Brochu & Morrison, 2007; Jewish/Asian: Rudman & Ashmore, 2007; Hispanic: Ottaway, Hayden, & Oakes, 2001; Weyant, 2005; Black: Nosek et al., 2002; Vanman, Saltz, Nathan, & Warren, 2004).

In separate studies, Weyant (2005) and Ottaway et al. (2001) found negative implicit bias among Whites toward Hispanics on the IAT (i.e., outgroup bias). In addition, members of devalued minority groups tend to display negative

intragroup bias as indexed by the IAT (Lane, Banaji, Nosek, & Greenwald, 2007). For example, a negative IAT effect toward the ingroup has been found among both Blacks and Hispanics (Ashburn-Nardo et al., 2003; Livingston, 2002; Nosek et al., 2002; Uhlmann et al., 2002), reflecting intraethnic attitudinal ambivalence (Jost & Burgess, 2000). Specifically, Uhlmann et al. (2002) found outgroup favoritism on the IAT among Chilean Hispanics, and similarly, no evidence of ingroup favoritism among American Hispanics. An advantage of including the IAT is that it affords direct comparisons with previous research. Furthermore, the use of a relative measure like the IAT allowed us to assess the possibility that Hispanics could hold positive evaluations of both Whites and Hispanics but also have an evaluative preference for one group.

In this study, inter- and intragroup biases toward Hispanics were examined using the startle eyeblink and IAT, utilizing both in- and outgroup participants. The Pettigrew and Meertens (1995) Prejudice Scale (PMPS) served as a direct measure of bias. It was expected that both Whites and Hispanics would demonstrate negative relative biases toward Hispanics, as indexed by both SR and the IAT; however, these biases might be weaker in Hispanics. We also examined the strength of the relationships between measures used in this study (two indirect, one direct). While no studies could be found that correlated startle with IAT, Vanman et al. (2004) found no correlation between facial electromyography (EMG; cheek and brow) and the IAT, suggesting no relationship between the two indirect measures. Since startle and IAT measures tap different levels of bias (affective vs. cognitive), a relationship between startle eyeblink and IAT was not expected. The PMPS was included to explore relationships between direct and indirect measures of bias.

Method

Participants

Data were collected from 75 undergraduates (45 White, 30 Hispanic) who participated voluntarily and received extra course credit. Participants self-identified their race and ethnicity. Participants who self-identified as non-Hispanic Caucasian are herein referred to as White, and those who identified as ethnically Hispanic/Latino are referred to only as Hispanic, even if they also self-identified as White. All participants were students at a large Hispanic-serving (enrollment > 30,000, > 25% Hispanic) public university in the Southwestern US situated in a medium-sized city (approximately 36.5% Hispanic), in a county that is approximately 29.5% Hispanic (U.S. Census Bureau, 2010).

While the original sample included males, the male sample was small in number, and to reduce the influence of sex-related variability inherent in psychophysiological responses (Amodio et al., 2003), only female participants' data were used. Data from 13 female participants were excluded (medication use, $n = 6$; startle nonresponders, $n = 4$; technical problems, $n = 2$; and extreme scores, > +/− 3 *SD* on both indirect measures, $n = 1$). Of the remaining 49 females, 22 were Hispanic ($M_{age} = 21.8$ years, $SD = 2.94$) and 27 were White ($M_{age} = 21.5$ years, $SD = 2.62$). Participants were screened for normal or corrected-to-normal vision, hearing, and acoustic sensitivity. The Institutional Review Board at Texas State University approved procedures for human subjects.

Electrophysiological Recording and Analysis

EMG data were collected from two, 4 mm Ag-AgCl electrodes placed approximately 20 mm apart over the orbicularis oculi muscle under the left eye, with a forehead ground. Data were acquired with a BioPac EMG100C amplifier and AcqKnowledge 3.8.1 software (Biopac, Goleta, CA) at a rate of 2,000 Hz, amplified with a gain of 5,000, and notch (60 Hz) and bandpass filtered (HP = 10 Hz, LP = 500 Hz) online. Additional stop (57–63 Hz) and band pass (HP = 28 Hz, LP = 500 Hz) filters were applied offline. Raw EMG data were rectified, fully integrated, and averaged over 20 samples utilizing the root mean square. Intraparticipant EMG

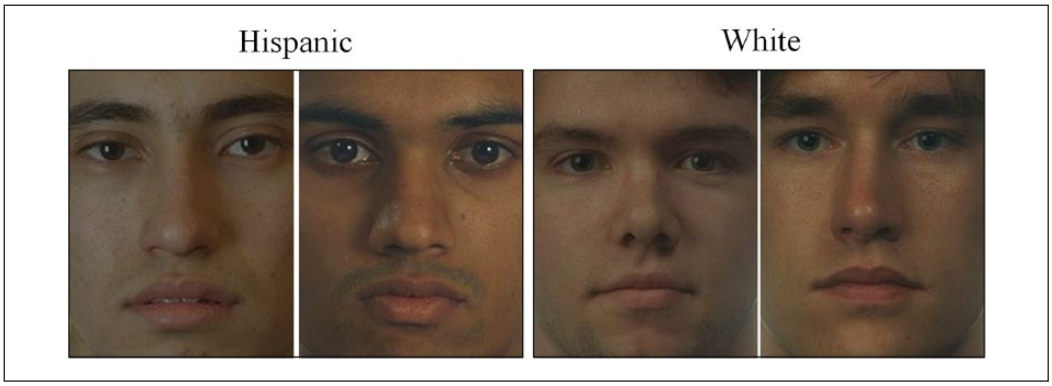

Figure 1. Examples of Hispanic and White exemplars used as stimuli for both startle and IAT.

amplitudes were standardized (Z-scores) to control for individual baseline differences (Phelps et al., 2000). An average of 1.2 trials (6%) per participant were removed due to nonresponse, baseline noise, baseline eyeblink, or amplitude > 3 standard deviations above the intraparticipant average. An average of 18.8 startle eyeblinks were processed per participant (range = 15–20).

Indirect Measures of Bias

Stimuli. Forty neutral photographs (males; 20 White, 20 Hispanic) from the FERET database (Phillips, Wechsler, Huang, & Rauss, 1998) were utilized as stimuli for the startle and IAT. Images were cropped to a viewing size of 12.7 cm x 9.80 cm (faces only) and equated for contrast and luminance (see Figure 1 for examples). Only male exemplars were used to control for gender variability (Amodio et al., 2003).

Startle paradigm. The startle task consisted of 40 trials. On a 46-cm monitor approximately 40 cm from the participant, trials began with a fixation (3,000 ms), followed by a centrally presented prime (6,000 ms). Two thousand to 4,000 ms after prime onset (randomized subset: 10 White, 10 Hispanic), an acoustic probe (50 ms burst of 1,000 Hz, 100 dB white noise) was rendered binaurally through stereo headphones. This ISI pattern was utilized to mitigate the influence of control at longer latencies, and to maximize the likelihood of engaging affective processes (Amodio et al., 2003; Robinson & Vrana, 2000). The intertrial interval (ITI) between prime offset and onset of the next fixation ranged from 14,000–18,000 ms.

Implicit Association Test. The IAT instructed participants to identify White or Hispanic faces, and positive (e.g., love, happy) or negative (e.g., evil, hurt) words with a keyboard key-press. The two test blocks were counterbalanced across participants. IAT congruency is labeled as a function of cultural stereotypes, not participant ethnicity. Therefore, White + good/ Hispanic + bad trials are referred to as congruent, and White + bad/ Hispanic + good trials are referred to as incongruent. IAT data were processed separately following the conventional (Greenwald et al., 1998) and improved (Greenwald, Nosek, & Banaji, 2003) scoring algorithms. For conventional scoring, the first two trials of each test block were dropped, as were trials with latencies +/− 2.5 *SD* from the intraparticipant mean (congruent: 1.6%, incongruent: 4.2%), and no subjects were eliminated for slow responses and/or high error rates. Using the improved algorithm, no trials were dropped (no trials with latencies > 10,000 ms) and no subjects were eliminated (no subjects with > 10% of trials less than 300 ms). Evaluative bias was defined as the mean difference in response times (RTs) to congruent versus incongruent trials as well as by positive *D*-scores.

Explicit Measure of Bias: Pettigrew and Meertens Prejudice Scale (PMPS)

The PMPS (1995) consists of two, 10-question subscales (blatant and subtle). Researchers have found these scales to be internally consistent (α = .88 blatant, .78 subtle; Pettigrew & Meertens, 1995), and similar values were found in this study (α = .84 blatant, .71 subtle). Scale questions were altered to indicate "Hispanics" as the target ethnicity. Separate scores for blatant and subtle subscales were tabulated and standardized (Z-scores) and each scale was explored separately.

Procedure and Data Analysis

After participants gave informed consent, they were assigned to the startle paradigm or IAT (counterbalanced). The PMPS was always completed last. Participants were informed that they would be partaking in a study exploring different measures of perception, and that their reactions to faces would be measured using both sensors on their face (i.e., EMG) and the IAT. Prior to the startle procedure participants were instructed to pay attention to the screen, that pictures would appear on the screen, and that tones would present at random times.

Standardized startle eyeblink amplitudes were examined by mixed ANOVA with prime type (White vs. Hispanic) as a within-subjects factor, and ethnicity (White vs. Hispanic) as a between-subjects factor. As there is debate regarding the appropriate method for IAT analysis (see Teige-Mocigemba, Klauer, & Sherman, 2010), we conducted analyses of both raw RTs and *D*-scores. Raw RTs were analyzed using mixed ANOVA with IAT trial type (congruent vs. incongruent) as a within-subjects factor, and ethnicity as a between-subjects factor. Individual *D*-scores were calculated for each participant by dividing their averaged millisecond difference between congruent and incongruent blocks by their overall latency *SD* (Greenwald et al., 2003). Individual *D*-scores were analyzed by univariate ANOVA with ethnicity as the between-subjects factor.

To explore relationships between measures, difference scores were calculated from startle amplitudes and IAT RTs. For startle data, we converted startle Z-scores into *t*-scores (Phelps et al., 2000), and subtracted *t*-scored eyeblink amplitude during White primes from *t*-scored eyeblink amplitude during Hispanic primes. For IAT data, we subtracted mean RTs to White + good (congruent) from White + bad (incongruent) trials. The type of subtractions made to produce these bias scores means that positive difference scores and *D*-scores indicate negative bias toward Hispanics. Bivariate correlations between all measures were then computed for combined groups, and then separately for both participant groups.

Results

Analysis of Z-scored eyeblink amplitudes revealed a main effect of prime type, $F(1, 46) = 9.53$, $p = .003$, $\eta_p^2 = .169$, but no Startle x Ethnicity interaction, $F(1, 46) = 2.126$, $p = .152$. Startle eyeblink amplitudes during Hispanic (vs. White) primes were larger (White primes $M = -0.110$, Hispanic primes $M = 0.107$). No other significant effects were noted. Planned between-group comparisons were conducted to explore startle potentiation by ethnicity. Whites showed significant potentiation to Hispanic (vs. White) primes (White $M = -0.155$, Hispanic $M = 0.151$, see Figure 2a; $t(27) = -2.99$, $p = .006$), while potentiation to Hispanic (vs. White) primes did not differ among Hispanics (White $M = -0.056$, Hispanic $M = 0.054$, see Figure 2a; $t(22) = -1.36$, $p = .187$). However, there were no significant between-group differences in SRs to White, $t(49) = 1.48$, $p = .147$, or Hispanic primes, $t(49) = -1.43$, $p = .159$.

Analysis of IAT RTs revealed faster RTs to congruent (814.9 ms) than incongruent trials (943.0 ms), $F(1, 46) = 68.56$, $p < .001$, $\eta_p^2 = .593$. This was mitigated by an IAT Congruency x Ethnicity interaction, $F(1, 24) = 12.68$, $p = .001$, $\eta_p^2 = .212$, whereby Hispanic participants were significantly faster to respond during incongruent (Hispanic $M = 881.4$ vs. White $M = 993.2$ ms, see

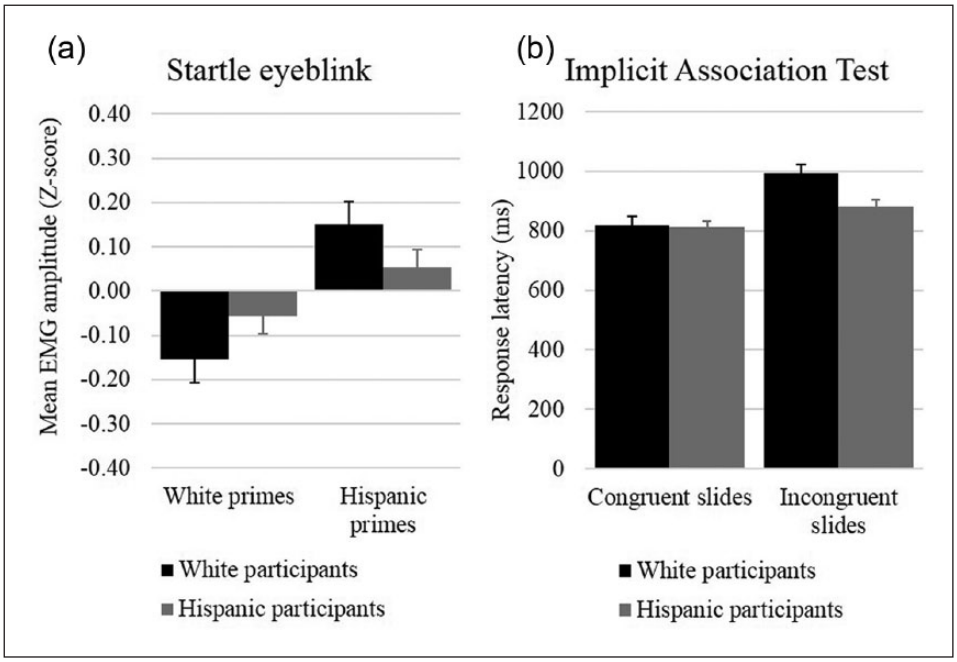

Figure 2. (a) Mean startle eyeblink EMG amplitude (error bars represent the standard error of the mean) to White and Hispanic primes and (b) mean IAT response latency to congruent (Hispanic + bad, White + good) and incongruent (Hispanic + good, White + bad) slides.

Figure 2b; $t(47) = -2.57$, $p = .013$) versus congruent trials (Hispanic $M = 811.5$ vs. White $M = 817.7$ ms, see Figure 2b). Analysis of *D*-scores revealed a larger IAT effect for Whites ($M = 0.481$ vs. Hispanics, $M = 0.244$), $F(1, 46) = 5.55$, $p = .023$, $\eta_p^2 = .106$.

No between-group differences were noted on either PMPS subscale and the majority of participants scored in the low range on both scales (i.e., overall levels of prejudice as measured by the scale were low).

Combined and separate groups IAT *D*-scores and IAT RTs were uncorrelated with eyeblink amplitudes. In contrast, a significant positive correlation was noted between combined groups SR amplitudes and the subtle prejudice scale, $r(49) = .286$, $p = .046$. However, when ethnic groups were examined separately, White participants with greater eyeblink bias tended to score higher on the subtle subscale, but this did not reach significance, $r(27) = .32$, $p = .10$, while Hispanic participant eyeblink bias was not correlated with subtle subscale scores, $r(22) = .17$, $p = .455$. No other significant correlations were noted.

Discussion

While research has demonstrated outgroup bias toward Blacks (Amodio et al., 2003; Phelps et al., 2000), this study is the first to examine White bias toward Hispanics and to use a startle paradigm to examine ingroup bias (outgroup favoritism). The main objective of the current study was to explore ethnic outgroup favoritism in Hispanic women. Additionally, we explored implicit and explicit indices of outgroup bias toward Hispanic men among White females. In- and outgroup biases toward Hispanic men were examined implicitly using SRs, the IAT, and explicitly using a self-report measure. It was expected that both Whites and Hispanics would display negative startle and IAT biases toward

Hispanics, but that Hispanic intragroup biases would be less pronounced than White intergroup biases. As hypothesized, we found overall SR potentiation to Hispanic primes relative to Whites, with weaker potentiation among Hispanic participants. Likewise, both groups displayed negative IAT bias towards Hispanic males, though participant ethnicity moderated IAT scores (IAT effects were more pronounced in Whites). Startle and IAT bias indices were unrelated, suggesting that startle and IAT may be tapping into different aspects of attitudes. Overall startle results were correlated with subtle prejudice scores, such that larger SRs were associated with higher scores on the subtle prejudice subscale. However, no relationships between measures existed when groups were examined separately. These findings are discussed in turn in the following lines in the context of prejudicial attitudes.

Our overall ANOVA results showed SR potentiation to Hispanic (vs. White) primes, and no between-group differences. Finding SR potentiation to Hispanic (vs. White) faces among Whites is consistent with previous research using long ISI startle paradigms to explore outgroup bias toward Blacks (Amodio et al., 2003; Phelps et al., 2000). Potentiated SRs in Whites to Black faces has been interpreted as the result of the activation of a negative affective state, possibly as a result of prevalent cultural evaluations (i.e., stereotypes) regarding Blacks that include threatening attributes (Amodio et al., 2003). Following this interpretation, our results suggest that relative to Hispanic participants, a negative affective outgroup bias towards Hispanic males was present among White participants.

Hispanic participants' SRs during ingroup primes are somewhat more difficult to interpret. The finding of a main effect of prime type on SRs with no concomitant interaction between prime type and group suggests SR potentiation to Hispanic primes for both groups, indicative of outgroup favoritism in Hispanic participants. In contrast, planned within-groups comparisons of SRs revealed significant potentiation to Hispanic primes (relative to White primes) in White participants, whereas no significant differences in SRs to primes were noted in Hispanics. In the absence of differences between SRs to the two prime types across groups, the latter results are difficult to reconcile. Examination of Figure 2a suggests that standardized SR amplitudes were less extreme in Hispanic participants, although the overall pattern of results are comparable. Taken together, these results suggest that although a relatively negative ingroup bias may have been present for Hispanic participants, it was less marked than outgroup bias for White participants. The lack of control stimuli makes it difficult to offer precise statements regarding the positive or negative nature of the observed bias. It is possible that Hispanic participants displayed *less* negative bias toward Hispanic faces than White participants. However, we cannot rule out an interpretation wherein Hispanic participants displayed *more* negative bias toward White faces than White participants. In spite of this, the observed pattern of Hispanic ingroup derogation (outgroup favoritism) remains a novel finding.

It is important to note that alternative interpretations of these results are possible. While the SR is sensitive to affective responses potentiated by specific (generally negatively valenced) stimuli and affective states (e.g., threat) at long ISIs, it is also sensitive to attentional effects. For example, Brown et al. (2006) found no SR modulation with long ISIs to Black versus White faces among White participants, finding SR potentiation only to negatively valenced images, regardless of race depicted. Also, Vanman et al. (2013) found larger SRs among Whites at long ISIs during White (vs. Black) slightly smiling primes. It was hypothesized that the face primes used in their startle task were not sufficiently threatening, and therefore, participants paid more attention to the more "interesting" stimuli (i.e., the outgroup; Vanman et al., 2013). Therefore, SR amplitudes at long ISIs may reflect attentional effects and not affective properties (i.e., attenuated SRs reflect increased attention to primes). In this light, potentiated SRs to Hispanic versus White primes might not be due to negative affective responses to Hispanic primes. Rather, White (vs. Hispanic) primes may have

been relatively more interesting, capturing more attentional resources and inhibiting SRs to White primes. Thus, our findings may have been driven by attenuated SRs to White primes versus potentiated SRs to Hispanic primes.

However, observed patterns of SRs responses do not lend support to this interpretation. As seen in Figure 2a, overall standardized SRs to primes were less extreme for Hispanic participants relative to those for Whites, albeit more negative for White primes relative to Hispanic primes. An attentional account of these findings might suggest that Hispanic participants were more indifferent to the face primes, a conclusion which is difficult to justify theoretically. Furthermore, while Hispanic (vs. White) SRs to White primes showed evidence of attenuation, SRs to Hispanic primes were, nonetheless, potentiated. This latter observation would not be predicted by an attentional account. An attentional interpretation is further limited by the fact that SRs are highly sensitive to task demands. For affective startle modulation to occur, startle tasks must involve only passive or defensive (vs. active) attentional responses (Panayiotou at al., 2011), and studies requiring evaluative responses during image presentation have found weakened, unpredictable, or nonexistent startle modulation (King & Schaefer, 2011; Neumann, 2002; Panayiotou & Vrana, 1998; Panayiotou et al., 2011; Wangelin, Löw, McTeague, Bradley, & Lang, 2011). Thus, it is possible that the patterns of startle modulation found in Brown et al. (2006) and Vanman et al. (2013) resulted from evaluative task demands interfering with the mechanisms underlying affective modulation via implicit biases. Unlike these studies, the startle paradigm utilized in the current study did not involve evaluative judgments, and primes had neutral facial expressions. When combined with our finding that both groups showed similar patterns of a relatively negative bias toward Hispanics on the IAT, it seems likely that the SR modulation seen in this study reflects the engagement of low-level negative affective processes.

While SR results imply the existence of negative in- and outgroup biases toward Hispanic males, the exact nature of these attitudes remains speculative. There are many attitudes regarding Hispanics that may have influenced SR potentiation. For example, Hispanics are stereotyped as being more violent, unintelligent, and government dependent relative to other ethnicities (Wilson, 1996). Any of these characteristics could have triggered a negative affective response which would potentiate SRs. Alternatively, it is possible that since Hispanics constitute roughly 80% of undocumented immigrants in the US, and are often exemplified for media and political aggrandizement (Hoefer, Rytina, & Baker, 2009), people with negative attitudes toward immigration may implicitly feel threatened by Hispanics. Further research is necessary to identify the negative attitudes that contribute to SR biases, such as those observed in this study. Nevertheless, our results extend previous research by showing that negative biases in White and Hispanic females (as indexed by SRs) are present toward Hispanic men (vs. White men) and that under certain conditions, the startle response is an effective measure of affective in- and outgroup bias.

Both groups showed negative bias toward Hispanics on the IAT, replicating previous studies (Ottaway et al., 2001; Uhlmann et al., 2002; Weyant, 2005) and converging with startle results. However, an Ethnicity x Congruency effect was observed for IAT scores, but not for SRs. This result is consistent with other research finding a negative, albeit weaker, intragroup IAT bias among devalued minorities (Nosek et al., 2002) and may support the notion that people exposed to negative stereotypes about their race internalize and implicitly reciprocate stereotypes (Jost et al., 2002; Livingston, 2002). Interpreting our results is complicated by the fact that a number of theories exist regarding the mechanisms underlying the IAT effect, as well as the constructs measured by the IAT (see Rothermund & Wentura, 2004, for a review). For example, it has been hypothesized that the IAT assesses category-level associations, not reactions to individual exemplars (Fazio & Olson, 2003). Thus, it is possible that Hispanic participants recognized an association between the construct (i.e., bad) and

the category (i.e., Hispanics), in the absence of any personally held negative attitudes toward Hispanics (Fazio & Olson, 2003). However, taken together with startle results, IAT results are suggestive of relatively negative biases in White and Hispanic women with respect to Hispanic men. Future studies using mixed gender primes and participants, and controlling for other possible between-group differences are necessary to determine broader generalizability of results.

Both startle and IAT results were suggestive of ingroup derogation (i.e., outgroup favoritism). The finding of outgroup favoritism has implications for theoretical models of prejudice such as system justification theory (SJT; Jost & Banaji, 1994) and the notion that devalued groups may nonconsciously internalize negative societal evaluations about their ingroup after repeated exposure. In support of this concept, it has been shown that stereotypes are internalized passively and unintentionally (e.g., Gregg et al., 2006; Rydell & McConnell, 2006). Thus, it is possible that our Hispanic participants unknowingly held internalized negative stereotypes about their ingroup which then manifested on multiple levels. Results also support the idea that minorities implicitly endorse societal stereotypes about their ingroup, unconsciously justifying the status quo (Jost & Banaji, 1994). While it is generally held that outgroup bias is the predominant factor in perpetuating discrimination, negative ingroup bias may function not only in parallel to outgroup bias, but perhaps more subversively. Consequently, minorities themselves may unwittingly contribute to their continued marginalization.

The finding of implicit biases toward Hispanics supports the idea that negative biases toward minorities are predominantly driven by basic-level affect, which shapes higher level cognitive and behavioral processes. Given that affect is a more reliable predictor of prejudicial attitudes and behavior than cognition (Jackson et al., 1996; Lavine et al., 1998; Stangor et al., 1991), implicit affective ingroup biases may have an unaccounted for influence on social behavior, with implications for minorities like Hispanics. Since automatic reactions to racial cues have been shown to influence split-second decisions and intergroup judgments (Ashburn-Nardo et al., 2003; Correll, Urland, & Ito, 2006), ingroup biases are critical to our understanding of discrimination. Our results converge with studies conducted with other minorities and devalued groups to demonstrate that outgroup favoritism is a corollary of racial biases toward minorities that needs to be widely integrated into theories regarding the nature of discrimination.

The present research has theoretical, but also practical implications. Amodio et al. (2003) have postulated that emotional learning may make it difficult to alter prejudicial attitudes, suggesting that if research can successfully link physiology with race bias, our understanding can move from mostly theoretical psychological models to the neuroanatomical mechanisms underpinning bias. For example, the amygdala plays a large role in the learning of conditioned fear, whereby stimuli become associated with affective responses through experience (LaBar, Gatenby, Gore, LeDoux, & Phelps, 1998), and therefore may have a role in racial bias (Phelps et al., 2000). Devine, Plant, Amodio, Harmon-Jones, and Vance (2002) have suggested that unlearning prejudice on an affective level will involve replacing ingrained negative associations (i.e., stereotypes) with positive ones, a process which requires time and alterations in psychophysiological and behavioral responses to race-related stimuli. Thus, longitudinal studies of implicit racial biases could index changes in affective responses over time due to unlearning. Our results support the role of negative affect in implicit race-related biases and underscore the importance of considering both in- and outgroup biases as targets for unlearning.

Similar patterns of results for the two indirect measures were observed, but no associations were noted between startle and the IAT. This discrepancy may be due to differences in task demands. IAT responses reflect two processes: effort responding to congruent trials (automatic associations) versus effort responding to incongruent trials (influenced by controlled processes; Amodio & Mendoza, 2010). As such, the IAT

does not distinguish between positive and negative associations, but only relative preference (Amodio & Lieberman, 2009), and unlike SRs, it has been argued that the IAT taps into both automatic and controlled processes (Lane et al., 2007), and may involve categorical evaluations (Mitchell, Nosek, & Banaji, 2003). Furthermore, it has been noted that semantic components may influence implicit evaluations during the IAT (Amodio & Devine, 2009), and since the IAT requires a deliberate response, it is susceptible to an unknown amount of executive control (Fazio & Olson, 2003; Fiedler & Bluemke, 2005). In contrast, the SR is thought to be automatic and independent of semantic evaluations (Amodio & Mendoza, 2010). The pattern found in the current study may indicate that these measures index different aspects of prejudice: startle indexing affective-evaluative bias and the IAT measuring bias at evaluative-cognitive level. Nevertheless, the similarity in the pattern of results across tasks implies that inter- and intragroup biases are manifested comparably at multiple levels of processing, although they may be elicited in unique ways. This supports Guglielmi's (1999) position that affect and cognition, though most likely interactive, operate via parallel networks that make independent contributions to inter- and intragroup attitudes.

Correlational analyses showed a relationship between SR and subtle prejudice scores on the PMPS, while the IAT was not correlated with SR or either PMPS subscale. Subsequent analyses conducted on each group separately revealed that scores among White participants may have been driving the observed correlation between SR and subtle prejudice scores. The observed trend toward significance among Whites suggests that the subtle subscale may be tapping into affective-level bias, but further study is needed to determine convergent validity. No correlations were found between implicit measures and the blatant subscale. Although further investigation is necessary to understand the nature of this dissociation between implicit and explicit measures, our results suggest that intragroup biases are relatively automatic.

It is important to note that the current study only examined female responses to male faces; therefore, it is possible that participants were responding not only to the ethnicity, but also to the gender of the prime. It is not clear whether similar attitudes (as indexed by both SR and IAT) would be observed in Hispanic males viewing Hispanic male faces, and/or would also generalize to faces of Hispanic females. Due to difficulties in recruiting Hispanic male participants, we felt it necessary to use only male faces and female participants. This ensured sufficient samples for between-group comparisons while also controlling for gender-related variability inherent in responding to male faces. We also did not collect SRs during neutral stimuli, meaning the bias demonstrated is relative, not absolutely positive or negative. Although these design constraints limit the generalizability of our results, restricting our sample and stimuli in this manner allowed for direct comparison to previous studies (e.g., Amodio et al., 2003). Also, as mentioned before, precisely which stereotypes about Hispanic men caused potentiated startle and negative IAT bias in this sample of Hispanic women remains uncertain.

In spite of this limitation, the results of the current study add to our understanding of ethnic and racial biases, in that they suggest that biases are present toward Hispanic men in both White and Hispanic women in ways that are similar to those toward other minorities. A strength of the current study is that it was conducted at a Hispanic-serving university (~25% Hispanic). In light of recent support for contact hypothesis (Allport, 1954), whereby positive exposure to minority groups mitigates the effects of stereotypes towards those groups (Ellison & Powers, 1994; Welch & Sigelman, 2000; Yancey, 1999), findings of bias in this (highly Hispanic) setting should generalize to, or even underestimate, bias in less diverse settings, even if limited to female bias towards White and Hispanic males. Future research using mixed gender primes and participants, and controlling for other possible between-group differences (e.g., ethnic identity, motivation to control prejudice, acculturation), is necessary to determine broader generalizability of results.

To summarize, this study expanded on the extant literature on racial/ethnic attitudes by examining inter- and intragroup biases toward Hispanics using indirect and direct measures. While both Whites and Hispanics displayed a relatively negative bias toward Hispanics on startle and IAT, Hispanic intragroup attitudes were less negative than White intergroup attitudes. These findings highlight the importance of examining intragroup biases in order to yield a comprehensive understanding of racial/ethnic bias. These results further suggest that negative implicit racial biases may arise from automatic, low-level affective processes that affect both in- and outgroups. Startle and IAT were uncorrelated, suggesting that they were tapping into different aspects of bias. However, the similar pattern of results obtained from these two indirect measures suggests that inter- and intragroup biases were manifested comparably at multiple levels of processing. Their combined use may reveal subtleties in biases across a wide range of demographic groups, yielding a more complete profile of racial/ethnic bias. Further use of different measures across diverse samples is necessary to foster a greater understanding of the nuances of racial/ethnic biases, particularly the specific attitudes and attributions that give rise to prejudicial and discriminatory behaviors.

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