Gesture & Race: Does Implicit Bias Drive Evaluations of Both In-group and Out-group Members?

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Abstract

Implicit racism is an automatic biased attitude toward a particular group of people. Previous research had investigated non-verbal measures in association to implicit biases. Gesture, a form of a non-verbal measure, is fundamental in informing our understanding of how we process communicative information. In this study we investigated how ambiguous gestures affect individuals' emotional assessment and cognitive understanding of a message when they are produced by an in-group member versus an out-group member. Caucasian participants were randomly assigned to one of the four conditions (black speaker with emphatic or non-emphatic gesture or white speaker with emphatic or non-emphatic gestures). After the video they were asked to answer a set of questionnaires that examined their emotional and cognitive assessments and to complete an IAT task. Participants were more likely to rate the black speaker to be likeable and comfortable than the white speaker. In contrast, they rated the white speaker higher in clarity than the black speaker. In addition, factoring the IAT, participants who scored higher on the IAT, the lower they rated the likability of the black speaker. The results suggest that participants showed biases toward out-group members.

Keywords: gesture, race, implicit biases, aversive racism

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Does race really matter in how we understand gestures? Racial relations are part of the contextual backdrop that determines our perception of others and their behaviors (Dovido & Gaertner, 2000). Gestures are a powerful metric to test theories about implicit racism, not only because they provide observable data regarding people's mental representations, but also, because their interpretation provides us with a behind-the-scenes glimpse of the observer's own thought processes and perceptions (Alibali *et al*., 1999). Therefore, we attempt to use gestures to answer the seemingly simple question of: how do ambiguous gestures affect people's emotional assessment and cognitive understanding of a message when they are produced by an in-group versus an out-group member?

The need to understand the prevalence of racial inequality, despite changes in egalitarian attitudes, led researchers to search for empirical evidence that may explain the existence of this cultural phenomenon (e.g., Devine, 1989; Devine *et al*., 2002; Gaertner & Dovidio, 1977; Greenwald, McGhee, & Shwartz, 1998). Categorical markers of racial discrimination have declined. Yet, the racial framework—that is the foundation of American society—continues to operate in the context of the MODE (motivation and opportunity as determinants) model of attitude-behavior relations (Fazio, 1990; Fazio *et al.,* 1995; Feagin, 2010). This model states that spontaneous behavior is predicted by implicit biases, whereas the more controlled behaviors are predicted by explicit biases. The primary impact of contemporary racism is often in the form of suggestive racial microagressions and implicit attitudes that are automatically activated in the unconscious (Dovidio, Kawakami, & Gaeter, 2002; Sue *et al.,* 2007). Greenwald and Banaji

assert that "the signature of implicit cognition is that traces of past experience affect some performance, even though the influential earlier experience is not remembered in the usual sense—that is, it is unavailable to self-report or introspection" (Greenwald & Banaji, 1995, p.4-5). Individuals are often not aware of the stereotypes and judgments that they hold, therefore their unconscious implicit biases are discharged through their behaviors and attitudes (Dovidio & Gaertner, 2000; Gaetner & McLaughlin, 1983; Hinzman & Kelly, 2013; Hugenberg & Bodenhausen, 2003).

Additional studies provide neuroimaging support for the role of implicit cognition in racial relations. Liew and colleagues reveal that neural regions that form the basis of action observation and intention understanding are modulated by race; and observations of in-group members (those of the same racial category) are correlated with increased sensory-motor and emotion-related processing, whereas observations of out-group members are associated with greater visual processing (Liew, Han, & Aziz-Zadeh, 2011). Other neuroimaging studies also demonstrate that activation of neural systems involved in empathy and the simulation of others' actions are restricted to in-group members; and, this effect is driven by a combination of racial/ethnic categories and socially learned associations (Gutsell & Inzlicht, 2010; Losin, Cross, Lacoboni, & Dapretto, 2014). Even when our brain is trying to detect and control our race-biased responses, these biases manifest themselves through our actions or behavior (Amodio *et* al., 2004). Thus, this body of research suggests that implicit race biases exist, even at the neuroanatomical level, and these biases have a subtle significant impact on our emotional and cognitive processing (Liew, Han, & Aziz-Zadeh, 2011).

Previous studies have investigated the association between nonverbal behaviors (e.g., eye contact, blinking, visual information etc.) and implicit racial bias (Dovido et al., 1997). These nonverbal behaviors are influential and interpretable in interracial interactions (Dovido et al., 2002). However, to our knowledge, no study has *specifically* examined the effects of race on gesture processing. Gestures are known to convey multidimensional and complex meaning (Goldin-Meadow, 2005), but what are the influences of race in our mental representation of gestures and their meaning?

Interestingly, Hinzman and Kelly (2012) were able to show that race affects the integration of faces and emotional body language. Participants were tested on their reaction time when observing a black or white face, which was digitally paired to both an angry and a happy body. Results show that the participants had faster reaction times when observing white faces paired with happy bodies, whereas black faces elicited faster reaction times when paired with angry bodies. Thus, we know that the effects of emotional body language, on the processing of in-group and out-group faces, are modulated by race. Furthermore, given the communicative power of gesture in emotional (Ekman & Friesen, 1967) and cognitive domains (Goldin-Meadow, 2005), the scarcity of existing research on the influences of race in the processing of gestures is a notable omission. Gestures could be used as a window onto cognition that allow us to observe the seemingly unobservable—that is, people's implicitly biased thoughts with regards to race.

With regards to the cognitive benefits of gestures, research has shown that gestures improve comprehension of material in educational settings (Gauger, 1952). In addition, the observation of gestures impacts the affective evaluation of a speaker and reflective evaluations

of one's own performance and understanding (Kelly & Goldsmith, 2004). Participants that watched a video of a lecture in the gesture-present versus gesture-absent condition liked the lecturer more when gesture was present. Thus, gestures seem to help us learn and understand novel material, but they also influence our perception of others.

Correspondingly, gestures play an integral role in communication and are part and parcel of implicit cognition (Broaders et al., 2007). Broaders and colleagues found that forcing children to gesture led them to display their implicit knowledge of solutions to math problems. In this study, gesturing was used as a method of eliciting implicit understanding. Importantly, the movements that we produce are part of the visuospatial world that does not go unnoticed, partly because they convey information that is not included in speech, and they can sometimes lead us astray from the accurate representation of details, without us even knowing that we paid attention to them (Broaders & Goldin-Meadow, 2010). Similarly, the gestures that we spontaneously produce can also convey accurate information that is not transmitted in speech.

People are unconsciously aware of the gestures produced by others and this automatic processing of gesture influences how people determine meaning during communication (Kelly *et al*., 1999). In addition, such unconscious awareness of gestures (by their producers or observers) can influence peoples' perception of others' moral character with regards to abstract concepts such as honesty; and, gestures can alter one's controlled behavior (Parzuchowski & Wojciszke, 2014). In this study, participants who performed hand-over-heart gesture (an emblematic gesture related to honesty) were perceived as being more honest and they behaved more honestly relative to those who performed neutral gestures (hand over stomach or shoulder) or no gesture at all.

Based on such evidence, perhaps gestures can inform our understanding of implicit race bias, or the reverse, implicit race bias can inform our understanding of how we process gesture information and how this information is incorporated in the representation of meaning. In both cases, the implications are profound. By manipulating our gestures during interracial interactions, we might be able to *alter* the input we provide to our racial counterparts; our own behavior; how we are perceived by others; and, our understanding of one another as racial agents. Similarly, our own implicit race bias could be altering how we "see" the gesture world. For example, our perceptions of the emotional valence of gestures could be modified by the race of the person producing the gestures. The present study attempts to fill the current gap in the literature in the hopes of answering the aforementioned question of: does race really matter, with regards to gesture? Specifically, the goal of the present study is to investigate the role of race *and* hand gestures on cognitive function and the emotional assessment of others.

In this paper, we define gestures as unwitting spontaneous hand movements that accompany speech and derive their meaning from their orientation, direction, and shape (Gullberg & Holmqvist, 2006; McNeill, 2008). The primary gestures of interest are beats and metaphoric gestures. Beats are also considered to be relatively ambiguous with no strong influence on cognitive and affective evaluations of a speaker or speech content (Marricchiolo et al., 2009). Beats are spontaneous rhythmic gestures stressing words (McNeill, 1985) whereas metaphoric gestures are ones that use "physical space to represent abstract ideas" and they serve a cognitive function by helping gesturers generate words and concepts (Casasanto & Lozano, 2007).

Metaphoric gestures are also an inherent part of linguistic pragmatics (Chui, 2011). They provide additional information that allows for the conceptualization of metaphorical thoughts, which helps both the speaker and the listener during communication. This study focuses on beats because they might augment and improve the communicative function and efficacy of emphatic stress; their integration with spoken language is most likely automatic; and, beat gestures might direct the attentional state of the observer/listener during discourse (Biau & Soto-faraco, 2013; Butterworth & Hadar, 1989). In addition, beats and metaphoric gestures were selected because they might be simpler and more common than other types of gestures, both to observe and produce.

In the present experiment white college students were asked to watch videos of either a white (in-group member) or black actor (out-group member) giving a speech. In one condition emphatic gestures (a combination of beats and metaphoric gestures) were accompanied with speech and delivered with emphatic stress, and in the other condition the actors delivered the speech in a non-emphatic gestural manner. The participants were informed that this study was an attempt to investigate the persuasiveness of the speaker(s) and the art of effective rhetoric.

After the speech, participants completed an IAT test and filled out a questionnaire regarding the content of the speech and their evaluations of the speaker(s). The questionnaire seeks to measure the participants' explicit (i.e., likability of the speaker and comfortability of the speaker) and implicit biases (i.e., clarity of the speaker).

Given that gesture plays a crucial role for students in educational settings (Gauger, 1952; Kelly & Goldsmith, 2004), we predicted that an increase in the frequency/emphasis of gesture

would lead to better comprehension of speech material and evaluation of a speaker. Specifically, we predicted that the participants would have better recall of speech content for the white speaker within the emphatic gesture condition. Based on research showing that people with higher implicit racial bias over-attributed hostile emotion to black faces, compared to white faces, during a facial emotion change-detection task (Hugenberg & Bodenhausen, 2003), we predict that participants with higher implicit bias will over-attribute negative traits to a speaker who is a member of an out-group (a black speaker) as the frequency of gestures increase, and as the gestures become more emphatic. Finally, we predicted that the participants would rate the white speaker higher on measures of implicit racial bias (e.g, clarity).

Methods

Participants

Forty college undergraduates (12 men and 28 women) participated in the study for course credit. Participants were recruited from introductory psychology and neuroscience courses at Colgate University. They ranged in age from 18 to 22. Participants ranged in ethnicity (Asian, African American, Caucasian, and Hispanics) but majority of the participants were of Caucasian decent (31 Caucasian participants and 9 non-Caucasian participants).[1]

Materials

[1] We intended to only limit our participants to Caucasian docents, however, due to the lack of sign-ups, we decided to open our experiments to all ethnicities

Stimulus video. The video (approximately 3-an-a-half minutes in length) showed a female Colgate University student giving a speech about the issue of gender equality in the United States. None of the participants had heard the speech before. This speech was written by one of the experimenters and this particular topic was selected because we found that gender equality is an issue that the majority of Americans agreed upon (based on data from the pew global attitudes survey). Therefore, we assume that a controversial disposition regarding the message of the speech is unlikely to influence the participants' evaluation of the speaker or the content of the speech (refer to Appendix A).

We manipulated two independent variables for a total four versions of the speech. One variable was the race of the speaker (white or black). The actors were told to wear clothes that accented stereotypical associations. The use of such priming methods have been shown to increase the influence of implicit bias and activate participants' implicit attitudes (Dovido et al., 1997). For example, the black female actor wore a necklace that bore an image of the African continent and a head wrap, while the white participant was told to wear an AC/DC shirt under another plaid flannel shirt.

The second was the intensity of the gestures produced by the speakers (emphatic or non-emphatic). The non-emphatic gestures are compared with the emphatic gestures produced by the speaker

In the gesture-emphatic condition, the video depicted the entire head and torso of the speaker so that her hand gestures were visible, and this was the same across all conditions. The speakers were instructed to perform beats gestures as much as possible and were told to

imagine themselves as women during the antebellum period giving the speech to a lecture hall full of male politicians. This was done in order to make the actors speak passionately and perform the beats gestures with more emphasis. However, the videos include a combination of beats and metaphoric gestures. These gestures were chosen because we assumed that they would be more natural to the speakers. The goal was to stray away from too many restrictions that would make the speeches seem contrived and raise suspicions among the participants.

In the gesture-non-emphatic condition, the speakers were told to decrease the frequency/emphasis of *all* of their gestures. The other instructions included in the previous gesture condition were omitted (refer to Figure 1).

Questionnaire

Demographics. The demographic items asked participants their class year, sex, and major. We specifically asked participants these questions to gage their knowledge of psychology and to control for possible confounds. We included the gender question to provide a comparison of differences or similarities between male and female participants in the dependent measure(s).

Speech Content. In total there were seven multiple choice content questions related to the speech. These questions were included to compare participants' correct recall of speech content across the various conditions, and to see if race modulates their performance. In addition, there were two control questions embedded within the seven content questions. These questions were included to check if the participants were paying attention when answering the questions.

Attentiveness. In total there were three multiple choice questions that were embedded within the content questions to measure participants' attention (i.e. what month are we at now?)

Implicit racial bias measure. Implicit biases are defined as biases that are unconscious and unavailable to self-report or reflection. The question that asks "did the speaker speak clearly?," is considered an implicit bias measure because participants can consider the black speaker to be less clear based on existing prejudices related to implicit racial bias—that is, their overall preference for in-group members rather than out-group members. The clarity measure is not explicit because participants would not consider themselves to be racist if they perceive the black speaker to be less clear, since they can attribute their ratings to other situational variables (e.g., the speaker's tone, pitch, reading speed etc.). Importantly, participants wouldn't necessarily consider their ratings of the speakers on the clarity scale to be directly related to any out-group effect (i.e., positive evaluations of in-group members over out-group members).

Explicit racial bias measure. We operationally defined explicit biases as biases that are clearly expressed, developed, and available for introspection. In the question that asks "do you like the speaker?" participants are aware that the speaker is black. Therefore, they are more conscious of their biases and are likely to say that they like the black speaker because they don't want to risk the possibility that their ratings might be interpreted as a behavioral effect of a preference for their own racial category.

Dr. Fox questions. We also included a set of questions from the study on the Dr. Fox (Naftulin et al, 1973). These items asked questions of the following nature: Did the material stimulate your thinking? Did the speaker put the material across in an interesting way?

IAT. Participants completed the IAT (implicit association test) after they completed the questionnaire. The race IAT measures individuals' automatic responses and their implicit biases. It uses a response latency method to measure the strength of the association between races (i.e. black and white faces) and attributes (i.e. positive words and negative words). Participants' response latency is predicted to decline if race is matched with the attributes that they believe are congruent with that race (Dasgupta, McGhee, & Greenwald, 2000). The IAT measure was stripped of any explicit indications that it was a measure of implicit race bias. After the participants finished completing the IAT measure, a message thanking them for their participation would be displayed.

Procedure

Participants were tested individually or in groups of two to three participants. After they read and signed a consent form, they were told that they would be watching a video of a short speech delivered by a Colgate student, and that the speech was for a class assignment. The participants were also told that the primary purpose of the study was to investigate the art of rhetoric and the persuasiveness of the speakers. Participants watched a normal Quicktime video from a Macintosh computer that projected onto a movie screen in an empty classroom. Participants were randomly assigned to one of the four conditions: in-group gesture-emphatic, in-group gesture-non-emphatic condition, out-group gesture-emphatic or out-group gesture-non-emphatic condition.

Following the video, participants were asked several questions about the content of the speech and were asked to provide their affective evaluations of the speaker and the speech

(see Questionnaire items – Appendix B). In regard to the questionnaires, participants were instructed to rate the speaker or speech on a sliding scale (10 cm in width) by marking the scale with a vertical line. The scale was then coded as 1, being a low rating and 10, being a high rating. The participants were told they had five minutes to complete these questions. This was done largely because previous research has shown that people's ability to control a behavior becomes less relevant in a situation where the motivation to control such behavior is diminished, and we believed that the time pressure will be a demotivating factor that will increase implicit bias on decision-making (Chugh, 2004). Immediately after, all participants completed the IAT (implicit associations test) to determine their implicit bias scores (Greenwald & Schwartz 1998). After the end of the experiment participants were debriefed.

Results

A total of 40 participants were used for this analysis; 31 white participants and 9 non-white participants. There were 20 participants for the white speaker condition and 20 participants for the black speaker condition. In total, there were 10 participants in the white-emphatic gesture condition, 10 participants in the white-non-emphatic gesture condition, 9 participants in the black-emphatic gesture condition, and 11 participants in the black- non-emphatic gesture condition. The variables were analyzed using the 2x2 multivariate ANOVA with race and gesture as the independent variables.

In total seven out of ten questions were content questions that was used to measure participants' cognitive understanding of the speech. We did not find significance in the content recall for race $F(1, 36) = 1.085$, *p>.001, d=.029*, or for gesture $F(1, 36) = .348$, *p>.001, d=.010*.

This suggests that recall of the content is not driven by race or gesture. For the rest of the results we will only present significant results from our data.

Main effects of race

Main effects of the race of speaker were found. Participants rated the black speaker (M=7.28) as more likable than white speaker (M=5.85), F (1, 36) = 15.30, *p < .001, d=.298*. Participants also rated the content to be more interesting for the black speaker (M=6.75) than the white speaker (M=5.56), F (1, 36) =5.30, *p=.027 d=.128* (refer to figure 2). A main effect was also found for the speaker's comfortability scale; participants rated the black speaker to be more comfortable (M=8.05) relative to the white speaker (M=6.15), F (1, 35) = 12.52, *p=.001 d=.264* (refer to figure 2). There was a marginal significant main effect of the participants' rating of clarity. Participants rated the white speaker (M=7.80) to be more clear, when delivering the speech, than the black speaker (M=6.88), F (1, 36) =2.82, *p=.102 d=.073* (refer to figure 3).

Main effects of gesture

A main effect of gestures was found to be marginally significant. There was a trend that participants rated the speaker in the clarity scale for the emphatic gestures (M=7.76) to be clearer than the non-emphatic gestures (M=6.95), F (1, 36) = 2.12, *p=.154 d=.056*.

Interaction effect of race and gesture

The interaction effect of content agreeability was marginally significant and was driven by the non-emphatic gesture condition, F (1, 36) = 2.81, *p=.102 d=.072*. Within the non-emphatic

condition, on average the participants agreed with the content more for the white speaker (M= 8.30) than the black speaker (M=7.32) (refer to figure 4).

Correlational analysis

Correlational analysis showed a marginally significant negative correlation between IAT and likability of the black speaker *r (*18) = -.387, *p=.046.* This correlation indicates that the higher the participants score for the IAT—meaning, the higher their implicit preference for White people—the less they liked the black speaker. This occurred despite the fact that, overall, the participants rated the black speaker to be more likable than the white speaker.

Other correlations validated that participants were attending to the video and to the questionnaire. The participants were indeed paying attention when they completed the questionnaire and the IAT. We found a significant positive correlation between the speaker's persuasiveness and content persuasiveness *r* (18) = .458, *p=.003*.

Moreover, there was also a significant positive correlation between content agreeability and content persuasiveness, *r* (18) = .393, *p=.012*. This indicates that when the participants find the content more persuasive, they also agree with the content. Furthermore, there was a significant positive correlation between the content comfortable scale and the speaker comfortable scale *r* (18) = .409, *p=.010*. This illustrates that when the participants rated the speaker to be more comfortable in giving the speech, they were also more comfortable with the content of the speech.

Discussion

The primary goal of the current study was to investigate the effects of emphatic and non-emphatic gestures on individuals' emotional assessment and cognitive understanding of a message, when they are produced by either an in-group or an out-group member.

We predicted that 1) an increase in frequency or emphasis of gestures will lead to a better comprehension of the speech content and evaluation of a speaker (Gauger, 1992; Kelly & Goldsmith, 2004). In addition, we predicted the recall of content would be higher for the white speaker than the black speaker. Our results however, did not show a significant difference in content recall for both independent variables of race and gesture. 2) We predicted that individuals with higher implicit bias will over-attribute negative traits to the black speaker in the emphatic gesture condition. Our results found that the participants rated the black speaker to be more likable and comfortable relative to the white speaker. Furthermore, we predicted that the black speaker would be perceived to be less clear than the white speaker across conditions. Our results supported this prediction, in the clarity of speaker scale (an implicit measure of racism); participants did rate the black speaker to be less clear than the white speaker.

Participants liked the black speaker more than her white counterpart; however, the black speaker had lower ratings of clarity. This effect may be driven by the role of ambiguity in the decision-making process (Rudman & Lee, 2002). Research suggests that the greater the number of credible and alternative explanations to racist predispositions, the more likely it is that implicit bias affects decision-making, more than explicit bias (Chugh, 2004). The question asking the participants if they liked the speaker had low levels of ambiguity and there were lower numbers of plausible and objective reasons as to why they wouldn't like the speaker.

Consequently, when we factored in the participants IAT scores for the gesture conditions of the black speaker, we found a significant negative correlation. Thus, implicit bias (IAT) negatively predicted the participants' ratings of the black speaker on the like scale (the higher they scored on the IAT the less they liked the black speaker). Similarly, participants rated the black speaker higher on the comfortability scale due to decreased levels of ambiguity.

The question regarding the clarity of the speaker, on the other hand, was more susceptible to an unconscious form of the fundamental attribution error – which is the propensity to attribute behavior to personal characteristics rather than contextual effects—(Ross, 1977), where the participant can attribute his or her own ratings of the speaker's clarity to contextual reasons rather than their own preferences for one particular social group over another. The more there are situational explanations for a particular decision, the more the participants' implicit bias will influence their decisions. The question regarding clarity gave the participants an "out" that allowed for the expression of a known implicit bias.

With regards to the content interesting scale, the participants found the content to be more interesting for the black speaker than the white speaker. This effect may be driven by the fact that the speech was written from the perspective of Abigail Kelly Foster, who was a white woman that fought for gender equality during antebellum America. And the incongruence in seeing a black orator provide an argument regarding gender equality from the vantage point of a white woman could be what piqued the interest of the participants.

Another interpretation of our results relates back to a sit-in that was organized by the student population at Colgate University during the fall semester. We believe that perhaps due

to the fact that issues regarding racial relations and the social climate at Colgate surfaced, during the fall term, students' motivation to control discriminatory beliefs and attitudes is much higher than it used to be. Therefore, it could be that the participants in this study rated the black speaker higher on many of our dependent measures due to the provoking impact of the social movements and events that occurred on (and beyond) Colgate's campus. Unfortunately, we do not have a way to directly investigate or corroborate this hypothesis due to the fact that we did not explore this particular research question at the beginning of last term. We don't believe that the sit-in clarifies the story behind our data completely; still, it is certainly plausible that it may have had a significant impact.

An additional alternative explanation is the possibility that participants are not implicitly biased toward out-group members. It is possible that the black speaker is purely perceived by the participants to be more likeable and more comfortable compared to the white speaker. There is also a possibility that the participants rated the black speaker to be more likeable because she presented herself in a well-organized manner. In addition, differences in presentation of speech could have influenced the perception of the speaker's clarity (i.e., the tone of the speaker). Perhaps, the white speaker is more articulate and the intensity of her tone was perceived to be clearer compared to her black counterpart and is not driven by the implicit bias of race. It is possible that the race of the speaker is not factored into their perception of the speaker.

Based on our data, we believe that the lack of significant findings for the gesture condition can be attributed to the fact that disregarding the frequency and the intensity of the gesture, all four conditions did contain gestural information. Since it was a between-subjects study,

participants did not compare the emphatic versus the non-emphatic gestures. Rather, gestures were present in all four conditions despite variations in prominence. Therefore, we anticipate that the frequency or intensity of the gestures did not have an effect on content recall; instead, the production of gestures could have been enough to account for the comprehension/ retention of speech content. Thus, we did not observe a significant difference between the emphatic and non-emphatic gesture conditions with regards to content retention.

The results can reflect the methodological limits of our study. Although we were striving for a more natural approach—without the use of restricting criteria or instructions—this particular paradigm increased variability in our study. The incongruences in the way that the speakers delivered the speech (i.e. differences in eye contact and expression) (Dovido et al., 1997) can alter participants' views of the speaker in terms of measures of likability, comfortability, and clarity. Furthermore, differences in tone between the black and white speakers can affect the participants' perception of the speaker's attitude based on sound intensity. The white speaker's intense tone can also play a role in clarity. Perhaps, through a firm delivery, the white speaker was perceived to be clearer when she delivered the message. Additionally, it is possible that the intense tone of the white speaker caused the participants to like the black speaker more and to perceive her to be more comfortable. Although pitch was controlled for, we were not able to control for other variable factors in relation to the speakers' vocal characteristics. These factors add variability to our study since it is certainly possible that the participants' ratings might be skewed due to these inconsistencies across conditions.

Moreover, the contextual backdrop and the environmental influences are different when a participant is alone or in a group because social influences become a factor in the latter

condition. We presume that environmental differences can also alter the participants' perception of the speaker and may influence their evaluation of the questions. Although the IAT is an implicit measure, social influences could have also affected their reaction time; the participants could have deliberately slowed down during trials to skew their result. In addition, our sample size contributes to another limitation. Due to our small sample size, both in and across conditions, our analysis may have missed some significant differences between our groups.

However, if it turns out that the differences we saw in our results were not due to methodological limitations (i.e. eye contact, voice, expression, environmental influences, etc.); our results could indicate that race was the driving force that influenced the participants' perception.

The fact that participants rated the black speaker to be more likeable, comfortable, and perceived the content to be more interesting when produced by the black speaker, may suggest the presence of a compensatory effect. Perchance, the participants were aware of the racial differences of the speakers, and in order to mask their implicit biases, they rated the black speaker higher on measures of explicit racial bias. Furthermore, in terms of clarity, the participants could have rated the white speaker to be clearer due to their implicit preferences for in-group members relative to out-group members. This is consistent with the observation of an out-group effect—which represents a tendency to provide negative evaluations of black individuals, and those of different racial categories, in comparison to their white counterparts—during the integration of emotional body language and processing of faces (Hinzman & Kelly, 2012).

For future studies, researchers could take a more controlled approach in order to manage possible confounding variables such as eye contact, tone, and gesture type/frequency. Physiological measures such as heart beat and skin response can be used to measure implicit bias in addition to the IAT in order to provide more conclusive evidence.

Physiological responses can provide a more accurate measure of automatic mechanisms. Moreover, as mentioned above, there are extensive neuroimaging studies that investigated implicit biases. We believe future studies can also add a neuroimaging element; participants' brain activities can be measured by using an fMRI or other neuroimaging techniques. Neuroimaging can strengthen the results of implicit racism from a neurological standpoint. It provides a reliable measure of one's implicit biases based on responses that are directly mapped on to the brain. More specifically, it would be interesting to examine brain regions that are related to processing of emotions and automatic response, such as the amygdala (Hart et al., 2000; Phelps et al., 2000).

A study by Hart and colleagues (2000) discovered that the amygdala has a significant greater activation to in-group faces than to out-group faces. But, habituation of in-group faces increased amygdala activation to out-group faces over time; suggesting that the amygdala is implicated in racial stereotyping. Furthermore, aside from the amygdala, the frontal cortex also plays a role in racial biases. Cunningham et al. (2004) discovered that when participants are deliberately controlling biases toward out-group members, there was an increase of activation in the frontal cortex and a decrease of activation in the amygdala. Thus, it may be of interest for future studies to examine the amygdala and the frontal cortex to measure implicit stereotypes when speech is accompanied by gesture.

Finally, our study contributes to the theoretical frame work regarding involuntary implicit biases that are out of one's awareness and to a new area of gestural study relating implicit biases and gesture perception.

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Figures

A. 

C. 

B. 

D. 

Figure 1. Screen shots of stimulus video: Emphatic gestures are characterized as larger and more intense beat gestures; non-emphatic gestures are small subtle beat gestures. A. In-group speaker with non-emphatic gesture, B. in-group speaker with emphatic gesture, C. out-group speaker with non-emphatic gesture, D. out-group speaker with emphatic gesture

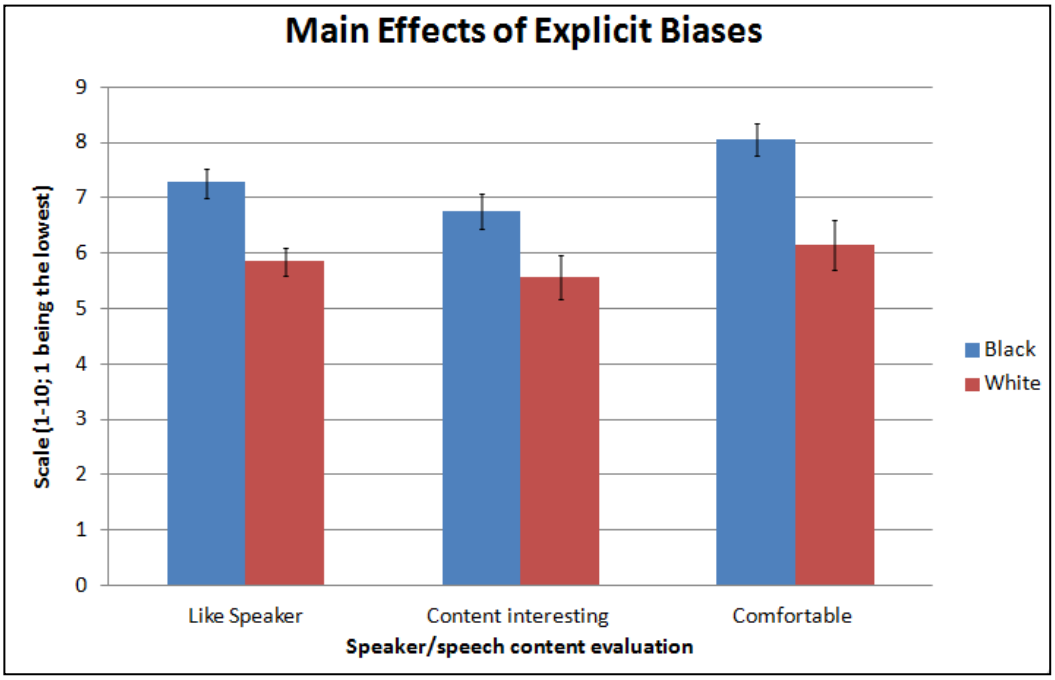

Figure 2. Bar graph showing the scale (ranging from 1-10; 1 being the lowest score and 10 being the highest score) for likability of speaker, content interesting, and comfortability of the speaker in relation to race of the speaker.

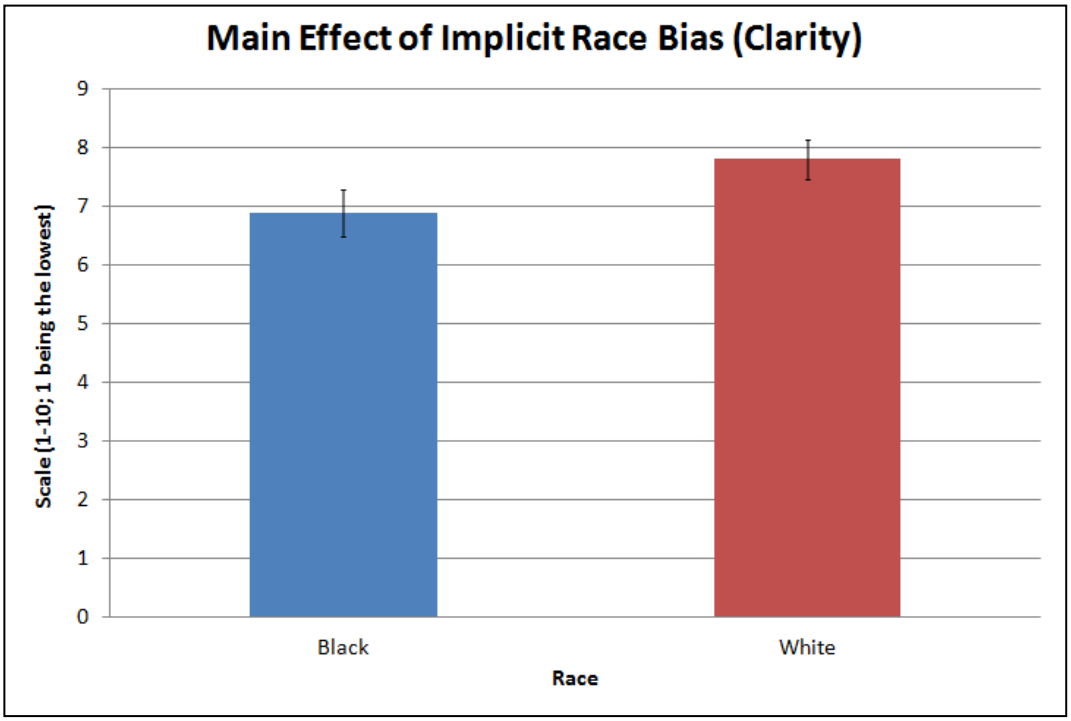

Figure 3. Bar graph showing the scale (ranging from 1-10; 1 being the lowest score and 10 being the highest score) of clarity in relation to race of the speaker.

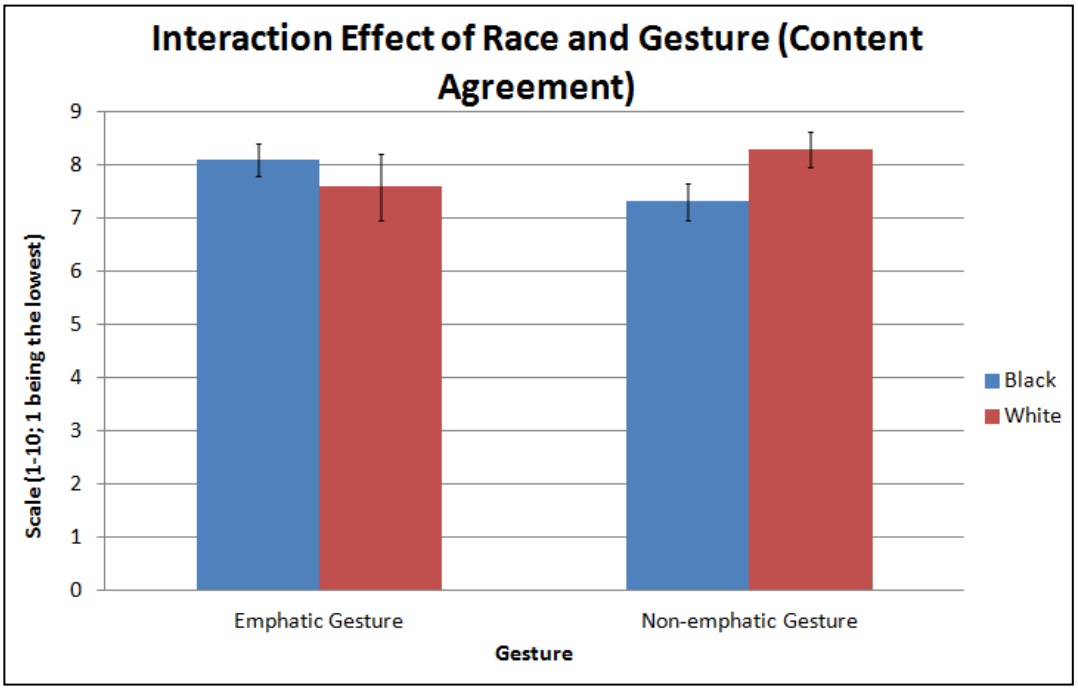

Figure 4. Bar graph showing the scale (ranging from 1-10; 1 being the lowest score and 10 being the highest score) of content agreeableness in relationship to types of gesture and race.

Appendix A

Speech Content

Ladies and gentlemen, I stand before you today as an extension of a particular feminine voice—the voice of Abigail Kelley Foster.

Foster is remembered in history as ardent abolitionist, an influential anti-slavery reformer, and **a leader** in the fight for the cause and rights of women in America. Among Foster's notable accomplishments was the organization of the 1850 National Women's Rights Convention. Foster appeals to women in to share some of the blame on the status of women in society, and to take on **responsibility** in furthering the role of women in every aspect of American life. She even goes on to say that, "woman lacks her rights because she does not **feel** the full weight of her **responsibilities**". By this, Foster is not implying that women are irresponsible. **On the contrary**, Foster is simply highlighting the fact that if women felt that it was their **duty** to contribute to aspects of the **democratic**, **intellectual**, and **moral culture** of society, then they will be equal to men. And I fully agree with Foster that by adopting this sense of **responsibility**, women will become induced to fill the **highest** positions for which **they are** qualified to occupy.

These sentiments are also just as relevant today as they were in 1850. An iteration of Foster's message can be seen in contemporary female voices and works such as *Lean In: Women, Work, and the Will to Lead*, written by the Chief Operating Officer of Facebook, Sheryl Sandberg. In her book, Sandberg states that, "**we lower** our own expectations of what we can

achieve". This relates back to Foster's message of the need to kindle an internal will and drive in women to provide for what she describes as "the **physical necessities** and **elegances** of life".

Thanks to the efforts of Foster and the women of antiquity, **there are now** women who currently hold executive positions in Fortune 500 companies. **There are now** women in leadership positions in Washington enforcing laws and demonstrating the capabilities of **women** in the public sphere. **Women** also make up nearly half of the workforce and are the sole breadwinners in approximately **23% of families**, which is a big increase from what it used to be in 1976 at **6%.** Also, **women** are the top earners **28%** of the time, when both partners are employed. This means that for **more than 12 million** American families, the women are bringing home more of the bacon. Women play an integral role in our society and by dint of their own labor they are able to accomplish many achievements that were once thought **impossible**, and overcome obstacles that were once thought **insurmountable**.

To the women in the audience and those enjoying the privileges provided by the women of antebellum America, I say to you what Foster said in 1850, "**bloody feet**, sisters, have worn **smooth** the path by which **you** have come up hither". **We must** remember that there are still gains to be made on the part of gender equality and **it is our** turn to bloody **our feet** and smooth the path for the next generation of **women and men** of America. Unfortunately today, only **12%** of workers have access to paid family leave and less than **40%** have employer-provided medical leave. In addition, women today are still paid 77 cents for every dollar paid to men; resulting in an annual loss of $11,600 in revenue, which could be utilized to cover necessities.

There has been progress made but we should not be comfortable with the status of women's equality today. As brothers, sons, husbands, and members of the community, it is our moral duty to stand with our sisters and mothers and wives to fight for progress; to fight for change; and to fight for our cause.

The red highlights depict some of the content material used for the questionnaire. The bolded words were suggestions made to the actors on when they should gesture, in both conditions.

Appendix B

Questionnaire

Questionnaire – please answer all the questions below

1. What year are you? (please circle one)
   a. First Year
   b. Second Year
   c. Third Year
   d. Fourth Year

2. What is your sex?
   a. Female b. Male

3. What is your Major: _____

4. How do you feel right now? (circle all that apply)
   Sad Happy Annoyed
   Indifferent Stressed Dominant
   Mad Uneasy Lonely
   Powerful Energetic Apathetic
   Others (please specify): _____

5. Do you know the speaker?
   a. Yes b. No

6. Do you like the speaker?
   a. Yes b. No
   On the line below, rate how much you like/dislike the speaker. (Mark one vertical line along the scale)

   _____

   Extremely Dislike Extremely Like

7. Did the speaker speak clearly?
   a. Yes b. No
   On the line below, rate how clearly you think the speaker spoke. (Mark one vertical line along the scale)

   _____

   Extremely Unclear Extremely Clear

8. What year was Colgate founded?
    a. 1810
    b. 1992
    c. 1819
    d. 2012

9. What did Abigail Kelly Foster organize?
    a. 1850 National Women's Movement Convention
    b. 2000 National Women's Movement Convention
    c. 2000 National Women's Rights Convention
    d. 1850 National Women's Rights Convention

10. What did the speaker say about women's rights?
    a. "Women lacks her rights because she does not feel the full weight of her responsibilities"
    b. "Women lacks her responsibilities because she does not feel the full weight of her rights"
    c. "Men lacks his rights because he does not feel the full weight of his responsibilities"
    d. "Men lacks his responsibilities because he does not feel the full weight of his rights"

11. Who is Colgate's mascot?
    a. The Panda
    b. The Raider
    c. The Tiger
    d. The Turtle

12. What are the three contributions to society that was listed by the speaker?
    a. Democratic, Intellectual, and Moral culture
    b. Responsibilities, Intellectual, and Moral culture
    c. Duty, Intellectual, and Moral culture
    d. Democratic, Responsibilities, and Moral culture

13. What month are we in?
    a. January
    b. February
    c. May
    d. March

14. What percentage of women are top earners?
    a. 6%

b. 23%
c. 28%
d. 52%

15. What did Abigail Kelly Foster say in 1850?
    a. “Bloody feet, sisters, have worn hard the path by which you have come up hither”
    b. “Blood feet, brother, have worn smooth the path by which you have come up hither”
    c. “Bloody feet, brother, have worn hard the path by which he have come up hither”
    d. “Bloody feet, sisters, have worn smooth the path by which you have come up hither”

16. How many percent of workers have access to pay for family leave?
    a. 12%
    b. 16%
    c. 28%
    d. 40%

17. What did the speaker say about progress?
    a. “there has been progress made but we should not be comfortable with the status of women’s equality today”
    b. “there has been some progress made but we should not be comfortable with the status of women’s equality today”
    c. “there has been progress made but we should be comfortable with the status of women’s equality today”
    d. “There has been some progress made but we should be comfortable with the status of women’s equality today”

18. Did you find the SPEAKER to be persuasive?
    a. Yes b. No

On the line below, rate how persuasive you found the speaker. (Mark one vertical line along the scale)

Extremely Not Persuasive — Extremely Persuasive

19. Was the speech CONTENT persuasive?
    a. Yes b. No

On the line below, rate how persuasive you found the content of the speech. (Mark one vertical line along the scale)

Extremely Not Persuasive — Extremely Persuasive

20. Did you find the speech content interesting?

a. Yes b. No

On the line below, rate how interesting you found the content of the speech. (Mark one vertical line along the scale)

Extremely Not interesting — Extremely Interesting

21. Do you agree or disagree with the argument of the speech?

a. Agree b. Disagree

On the line below, rate how much you agree/disagree with the argument of the speech. (Mark one vertical line along the scale)

Highly Disagree — Highly Agree

22. Did the speaker stimulate your thinking?

a. Yes b. No

On the line below, rate how much you found the speaker stimulating your thinking (Mark one vertical line along the scale)

Not at all — Extremely

23. Did the speaker put the material across in an interesting way?

a. Yes b. No

On the line below, rate how much you think the speaker put the material across in an interesting way. (Mark one vertical line along the scale)

Not at all — Extremely

24. Did the speaker present the material in a well-organized form?

a. Yes b. No

On the line below, rate how much you think the speaker present the material in a well-organized form. (Mark one vertical line along the scale)

Not at all — Extremely

25. Did the speaker use enough examples to clarify the material?
    a. Yes b. No

26. Did the speaker seem interested in the subject?
    a. Yes b. No
    On the line below, rate how much you think the speaker was interested in the subject. (Mark one vertical line along the scale)

_____

Not at all Extremely

27. What do you think about the speaker? (circle all that apply)
    Weak Strong Forceful

    Dominant Positive Approachable

    Powerful Lazy Aggressive

    Enthusiastic Violent Negative

    Others (please specify): _____

28. Did the CONTENT of the speech make you feel uncomfortable?
    a. Yes b. No
    On the line below, rate how much you feel comfortable/uncomfortable with the content of the speech. (Mark one vertical line along the scale)

_____

Extremely Uncomfortable Extremely Comfortable

29. What about the CONTENT of the speech that made you feel uncomfortable? (circle all that apply)

    The speech was about women's rights
    The way the speech is organized
    The speech content was shocking

    The speech content made me feel negative

Other (please specify) _____

30. Did the SPEAKER make you feel uncomfortable?

a. Yes b. No

On the line below, rate how much did the speaker make you feel comfortable/uncomfortable. (Mark one vertical line along the scale)

_____

Extremely Uncomfortable Extremely Comfortable

31. What about the speaker that made you feel uncomfortable? (circle all that apply)

Clothing Voice Expression

Ethnicity Gender Tone

Other (please specify): _____

32. Overall, did you like the speech?

a. Yes b) No