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# Accent-Based Implicit Prejudice: A Novel Application of the Implicit Association Test

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ACCENT-BASED IMPLICIT PREJUDICE:  
A NOVEL APPLICATION OF THE IMPLICIT ASSOCIATION TEST

A Thesis

Presented to

The Faculty of the Department of Psychology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Carolyn Chu

May 2013

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ACCENT-BASED IMPLICIT PREJUDICE:  
A NOVEL APPLICATION OF THE IMPLICIT ASSOCIATION TEST

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## ABSTRACT

### ACCENT-BASED IMPLICIT PREJUDICE: A NOVEL APPLICATION OF THE IMPLICIT ASSOCIATION TEST

by Carolyn Chu

In the present study, implicit attitudes toward accents were examined. The most common method used to study accent-based perceptions is by self-report questionnaires, which measure explicit attitudes. To my knowledge, no previous study has examined implicit accent-based attitudes. In the present investigation, auditory stimuli were used in a novel application of the Implicit Association Test (IAT) to measure implicit accent attitudes. Participants were randomly assigned to listen to a passage read in one of three foreign accents (Mexican, Chinese, or British) and the same passage in a Standard American accent. Participants also completed the Speech Dialect Attitudinal Scale, which measured explicit accent attitudes, and the IAT, which measured implicit attitudes toward the foreign accent relative to the Standard American accent. Implicit and explicit measures were counterbalanced. Results showed that participants had more favorable implicit attitudes for the Standard American accent than the Mexican accent and a mild preference for the Standard American accent compared to the Chinese and British accents. Implicit and explicit accent attitudes were largely uncorrelated. The examination of implicit attitudes in the current investigation complements previous accent research, which focused on explicit attitudes. Examining aspects of both implicit and explicit accent attitudes will lead to a more in-depth understanding of how accents affect individuals' perceptions, feelings, and judgments.

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## **Introduction**

Visual categories such as gender, race, and age are used by infants (Bar-Haim, Ziv, Lamy, & Hodes, 2006; Kelly et al., 2005), older children (Bennett, Sani, Hopkins, Agostini, & Malucchi, 2000; Verkuyten, Masson, & Elffers, 1995), adolescents (Liang, Grossman, & Deguchi, 2007), and adults (Gross & Hardin, 2007; Ollilainen & Calasanti, 2007) to divide the social world. In contrast, auditory categories, such as accent and language, have been understudied compared to visual categories. The studies that have been done show that auditory cues can activate different social categories (i.e., stereotypes; Hosoda, Stone-Romero, & Walter, 2007; Kim, Wang, Deng, Alvarez, & Li, 2011). Similarly, the attitudes and prejudice related to different auditory categories are very much understudied in comparison to visual-based prejudice and ingroup favoritism. Although not as prolific as the studies on visual-based prejudice, there are studies that do show the impact of speakers' accents on listeners' attitudes and perceptions (Deprez-Sims & Morris, 2010; Kavas, A. & Kavas, A., 2008). In the current investigation, listener preference for Standard American-accented speakers in comparison to foreign-accented speakers was examined.

Preference for one's own native language is present at a very young age. For example, Kinzler, Dupoux, and Spelke (2007) found that 5-month-old infants preferred to look at a person who previously spoke in their native language with a native accent compared to someone who spoke in a foreign language or a foreign accent. Furthermore, accent may be an even more prominent social category than the visual category of race for children (Kinzler, Shutts, DeJesus, & Spelke, 2009). The results of the study by

Kinzler et al. (2009) showed that although White children displayed friendship preferences for children of their own race and for those who had accents similar to their own (Standard English), when given the choice to befriend either a White child with a French accent or a Black child with a Standard English accent, participants chose the latter.

This preference for one's own native accent continues into adulthood. Moreover, preferences for accents similar to one's own can negatively affect one's perception of those who speak with dissimilar accents. After listening to an audio-recording of a lecture, American students perceived teachers with British and Malaysian accents to be less dynamic and possess fewer socio-intellectual and aesthetic qualities relative to teachers who gave the same lecture without an accent (Gill, 1994).

The majority of research suggests that standard-accented speakers are rated more favorably on traits related to competence, intelligence, and social status, than nonstandard-accented speakers. However, nonstandard-accented speakers are rated as comparable or more favorable on dimensions of kindness and solidarity (e.g., Cargile, Giles, Ryan, & Bradac, 1994; Nesdale & Rooney, 1990). However, these results have not gone undisputed. For example, when speech samples were matched for degree of accent, intensity level (volume), and speech rate, Spanish-accented speakers and Asian-accented speakers were not rated as having fewer positive traits than Standard American-accented speakers (Podberesky, Deluty, & Feldstein, 1990). One of the possible explanations Podberesky et al. provided for the surprising results included a number of variables (i.e., degree of accent, speech rate, intensity level of the speakers, and gender of

the speakers and judges) for which they controlled that previous studies did not. These variables may have had a mediating effect on the evaluations given by the participants. Other explanations they suggested may involve sociological and demographic factors. During the time of their study, the number of immigrants to the United States dramatically increased, and the study was conducted near two cities with large Hispanic and Asian-American populations. Therefore, this might have increased the likelihood that participants had been exposed to people who spoke with accented English. Furthermore, Podberesky et al. speculated that participants may have had close and positive interactions with the accented people they encountered (e.g., teaching assistants, professors, instructors), which may have contributed to minimizing negative stereotyping and lessened prejudice toward accents.

### **Accent and Comprehension**

There are different perspectives as to why nonstandard accents are rated more negatively than standard accents. One possible reason is that nonstandard accents may be associated with foreignness. This perspective views negative evaluations of nonstandard accents as a manifestation of prejudice, that is, there is a preference for what is similar to one's self and a dislike of what is unfamiliar to and dissimilar to the self (Osbeck, Moghaddam, & Perreault, 1997). An alternative perspective is that accents are rated more negatively because they are harder to comprehend and take more cognitive resources to understand (Munro, 1998). In other words, the negative evaluations of accented speech may be mediated by a difficulty in comprehension. There have been mixed results on the mediating effects of comprehension on favorable perceptions of

those with similar, standard accents. Participants correctly answered more questions whose answers were explicitly stated in the lectures when they listened to non-accented lectures compared to British and Malaysian-accented lectures. However, there were no differences in open recall. That is, when participants were asked “tell me what you remember from the lecture,” there were no differences in the amount of accurate information recalled between the foreign accented and Standard American English lectures (Gill, 1994). Furthermore, there were preferences for accents similar to one’s own, despite no differences in comprehension of those with or without an accent (Kinzler et al, 2009). Investigators who have found differences in comprehension between accented and non-accented speech have argued that these differences arise out of the processing cost associated with understanding an unfamiliar accent and limited cognitive resources, particularly under adverse listening conditions (Adank, Evans, Stuart-Smith, & Scott, 2009; Munro, 1998; Pisoni, Nusbaum, & Greene, 1985; Rogers, Dalby, & Nishi, 2004). Whether or not there is a difference in comprehension of accented and non-accented speech, many studies have shown preferences for one’s native accent and a favorable perception of speakers with one’s own native accent.

### **Methods Currently Used in Accent Research**

Studies of accent-based prejudice most commonly utilize self-report questionnaires, which measure explicit attitudes, attitudes that people are conscious of holding, endorsing, and want to reveal. Participants listen to passages read with no accent and an accent of interest. The spoken passages are matched on every quality (e.g., speed, volume, tone) except accent. After listening to both passages, participants rate the

speaker on a number of qualities (e.g., intelligence, warmth, competence), depending on the focus of the study. If the study is examining the effects of accents in school settings or work environments, the questionnaire may ask how likely the student is to take a class taught by the speaker (e.g., Rubin & Smith, 1990) or how likely the participant will hire the speaker (e.g., Cargile, 2000).

Self-report questionnaires measure the explicit attitudes that people hold toward accented speakers. However, there are two issues with self-report measures of explicit attitudes that call their accuracy into question. One issue is that measuring explicit attitudes on a questionnaire is subject to a social desirability bias: participants may report preferences that they deem as socially acceptable and expected from them rather than their true attitudes. A second issue is that even when participants try to report their “true” feelings, explicit attitudes only reflect attitudes and beliefs of which people are aware and are able to consciously control and display. However, research has demonstrated that our consciously held values and attitudes do not always align with our automatic reactions or behaviors toward those different from us. As Devine (1989) has demonstrated, controlled (explicit) and automatic (implicit) attitudes can vary dramatically and both can affect behaviors under different conditions. Therefore, explicit attitudes alone cannot fully predict behavior or automatic feelings across situations.

### **Implicit Attitudes**

Implicit attitudes are associations between a category (e.g., elderly people) and a feeling (e.g., dislike) that may exist outside of one’s conscious control and awareness (Greenwald & Banaji, 1995). Even those who truly endorse egalitarian values on explicit

measures have been shown to exhibit negative implicit attitudes toward outgroup members and ingroup favoritism on implicit measures (Castelli, Tomelleri, & Zogmaister, 2008). There have been hundreds of studies that demonstrate the distinction between explicit and implicit attitudes (e.g., Ashburn-Nardo, Knowles, & Monteith, 2003; McGrane & White, 2007; Nosek, Banaji, & Greenwald, 2000; see <http://www.projectimplicit.net/index.html> for an extensive listing of articles). For example, Cunningham et al. (2004) conducted a study in which participants completed the Implicit Association Test (IAT; a measure of implicit attitudes that will be further explained later), the Modern Racism Scale (McConahay, 1986), and the Motivation to Respond without Prejudice Scale (Plant & Devine, 1998; measures of controlled, explicit attitudes). Although all participants disagreed with prejudice statements, agreed with non-prejudice statements, and had motivation to respond without bias, on average, participants showed automatic negative associations toward images of Black faces relative to White faces on the IAT.

Devine (1989) further showed the distinction between implicit (automatic) and explicit (controlled) attitudes in a groundbreaking study that demonstrated that even low-prejudiced individuals, when subconsciously primed with the social category of *Blacks* and its stereotypic adjectives, later expressed prejudiced judgments consistent with the stereotype. However, under conditions in which participants were explicitly asked to report their thoughts regarding Black Americans, low-prejudice individuals reported more positive beliefs than did high-prejudice individuals. Devine's study demonstrated that one's implicit and explicit attitudes could differ.



Overall, this area of research has converged on three main points. First, it demonstrated that implicit and explicit attitudes are independent reactions. One may hold a negative implicit attitude toward a group while also having a positive explicit attitude toward that same group (or vice versa). It is also sometimes the case that an individual's implicit and explicit attitudes match (e.g., Karpinski, Steinman, & Hilton, 2005).

Second, we know that implicit and explicit attitudes predict different expressions of prejudice under different conditions. On the one hand, implicit attitudes predict behaviors under conditions of high cognitive load, where resources may be taken away from inhibiting automatic, stereotypic responses. On the other hand, explicit attitudes are better suited to predict behaviors under conditions where people have the cognitive resources to inhibit the automatically activated stereotype and intentionally activate their nonprejudice beliefs.

Third, implicit attitudes are a particularly good predictor of immediacy behaviors, which are verbal and nonverbal behaviors that influence one's perception of physical or psychological closeness (e.g., smiling, physical distance, or vocal tone; McConnell & Leibold, 2001; Neumann, Hulsenbeck, & Seibt, 2004; Rudman & Lee, 2002). For example, participants who held implicit negative attitudes toward Blacks, relative to Whites, displayed less speaking time, less smiling, and more speech errors when interacting with a Black experimenter, as compared to an interaction with a White experimenter (McConnell & Leibold, 2001). In addition to predicting behaviors toward outgroups, implicit attitudes also effectively predict behaviors toward ingroups (Ashburn-Nardo, Knowles, & Monteith, 2003; Jellison, McConnell, & Gabriel, 2004; Rudman &

Heppen, 2003). For example, when Black participants were told to choose a partner for an intellectual task, negative implicit attitudes toward Blacks predicted their preference for a White partner compared to a Black partner (Ashburn et al., 2003).

The distinction between implicit and explicit attitudes and the behavioral predictive value of implicit attitudes demonstrates that accent-based implicit attitudes are an important construct to study. A tool often used in assessing implicit attitudes is the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). The IAT provides an estimate of the strength of implicit associations between categories and emotional reactions. Implicit attitudes are measured by response latencies and errors in categorizing stimuli (in the form of words, symbols, or pictures). The IAT does this by differential association of two target concepts with two evaluative attributions. Categorizations' response time and error rates (i.e., miscategorizations) are the measures of the implicit association. For example (see Figure 1), one of the earlier studies had participants categorize pictures of faces as either being BLACK or WHITE by responding with a left or right hand response. Afterward, participants categorized words as being PLEASANT or UNPLEASANT. In the first critical stages (Stage 3 and Stage 4), participants categorized the names and words into two categories: BLACK or UNPLEASANT and WHITE or PLEASANT (congruent pairing condition). Finally, in the second critical stages (Stage 6 and Stage 7), the categories were reversed (BLACK or PLEASANT and WHITE or UNPLEASANT), and participants categorized the names and words into what was considered the incongruent pairing conditions.

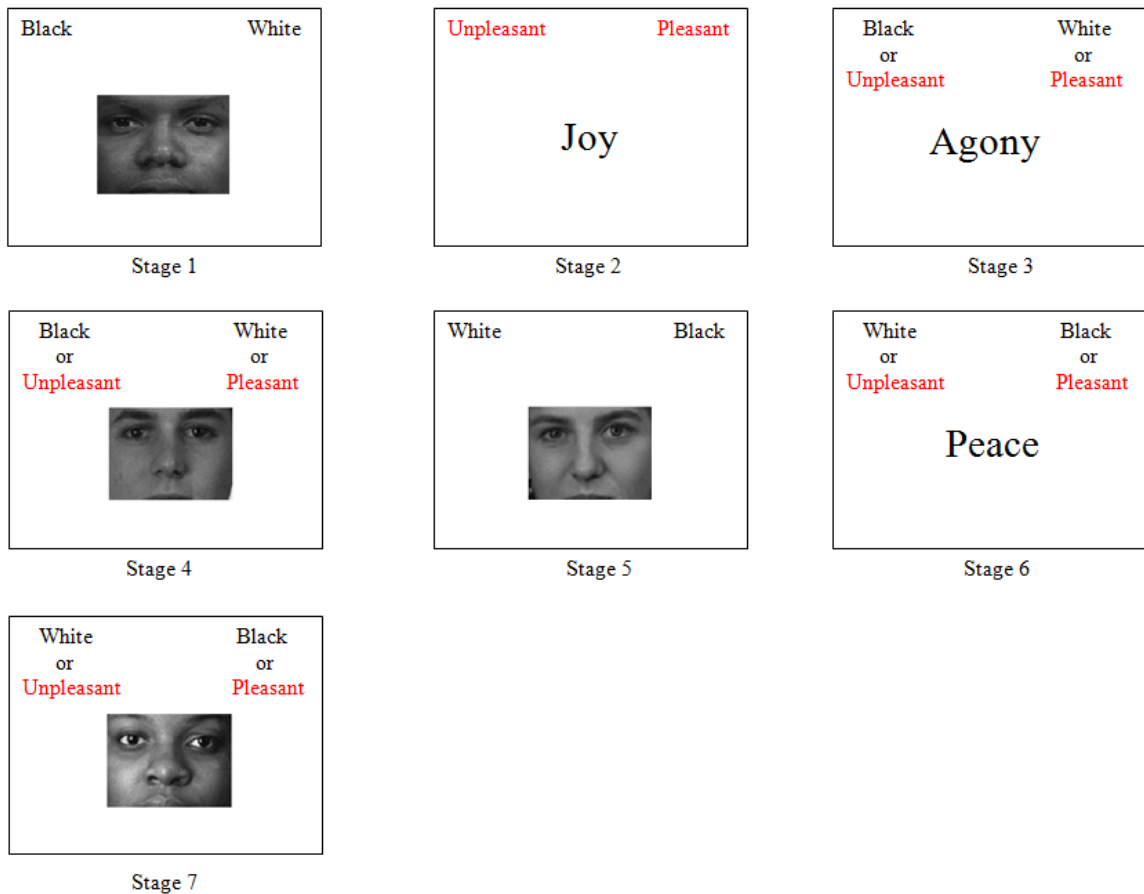


Figure 1. Structure of Example Implicit Association Test. This figure illustrates the different stages of the IAT in one of the original studies that used it.

If the target categories are differentially associated with the attribution, then the two sets of critical stages should have different response times and different error rates. In other words, if participants responded faster and more accurately with the congruent categories in comparison to the incongruent categories, then this indicated a greater positive implicit attitude associated with Whites relative to Blacks.

The IAT is a flexible tool researchers can use to assess the associations between numerous concepts and attributes. The IAT has been used to assess implicit attitudes regarding age (Levy & Banaji, 2002), race (Baron & Banaji, 2006), religion (Rowatt,

Franklin, & Cotton, 2005), disability (Ma, Chen, Zhou, & Zhang, 2012), sexuality (Steffens, 2005), weight (Roddy, Stewart, & Barnes-Holmes, 2011), and countless other social concepts. However, to my knowledge, the stimuli researchers have chosen have been restricted to words, symbols, and pictures. The novel use of audio stimuli in the IAT proved to be, in this investigation, an effective tool in assessing people's implicit attitudes toward accented speakers. In the current study, images of people of different ethnicities were replaced with the voice of speakers with different accents as the stimuli in the IAT in order to compare implicit attitudes toward speakers of nonstandard versus standard accents. Being able to assess this implicit attitude can help researchers measure the covariation of implicit and explicit attitudes toward accented speakers. Just as implicit attitudes have been effective in predicting behaviors toward different social groups, measuring accent-based implicit attitudes is a step in the direction of predicting behavior toward accented speakers.

### **Purpose**

Due to the lack of research assessing accent-based implicit attitudes, the primary purpose of this study was to examine implicit attitudes toward accented speech using the IAT. Using the IAT has several advantages. First, the use of the IAT theoretically removes the confounding factor of comprehension frustrations that may affect explicit measures of accent attitudes. The stimuli used in the IAT are short phrases rather than passages, and participants are not required to understand the content of the phrases. Instead, participants merely categorize whether the speech is accented or not. Therefore, comprehension of the speech is not necessary when the need to understand or extract

information beyond what is needed to categorize the auditory stimuli as either accented or not is unnecessary. Second, it allows us to determine the extent to which accent-based explicit and implicit attitudes covary. Third, this technique will facilitate an investigation of the differences in implicit and explicit attitudes of those with more exposure to a nonstandard accent and those with less exposure. The majority of race, gender, age, and accent studies have concentrated on the impact of outgroups on evaluations made by ingroups. Although there have been studies that examine the evaluations made by the minority group of the majority group, these have been mainly studies of race (e.g., McGrane & White, 2007; Monteith & Spicer, 2000). Therefore, this study will also investigate the differences in implicit and explicit attitudes of those with more exposure to a nonstandard accent and those with less exposure.

### **Hypothesis/Research Questions**

This study aimed to answer the question of whether or not implicit attitudes could be measured for accents, particularly toward speakers with a Chinese, Mexican, or British accent in comparison to a Standard American English-accented speaker. In order to answer this question, I relied on the response times and error rates of the IAT. If responses are on average faster and there are fewer errors in categorizing the stimuli with the bad/accents (congruent categories) than with the bad/no accents (incongruent categories) pairing, then there is an indication of greater negative implicit attitude associated with having an accent. I also hypothesized that accent-based implicit and explicit attitudes would be distinct constructs (i.e., uncorrelated) based on findings by

others of a distinction between implicit and explicit attitudes (e.g., Ashburn-Nardo, Knowles, & Monteith, 2003; Cunningham et al., 2004; McGrane & White, 2007).

Finally, I hypothesized that participants who come from a minority ethnic background and presumably have more intergroup interactions with those of different ethnicities and may be more exposed to foreign accented-English, would have relatively less implicit and explicit prejudice toward an accented speaker, compared to those of the majority ethnicity and those with less exposure to accented English. Specifically, participants who indicate that they are of an ethnicity other than White, come from multilingual homes, and/or have more interactions with those who speak foreign accented-English will have less negative perceptions of an accented speaker on an explicit questionnaire and will have shorter response latencies and fewer errors on the IAT, relative to participants who indicate that they are White, do not come from multilingual homes, and/or have less exposure to accented English. The intergroup contact hypothesis (Pettigrew, 1997) indicates that intergroup friendships will generalize widely to less prejudice and more positive feelings toward outgroups of many types. Bornstein's (1993) mere exposure effect also indicated that repeated unreinforced exposures to a stimulus or an individual evoke more positive attitudes. Although the mere exposure effect is typically applied to studies of race, I predicted that it can be generalized to accent studies.

## Method

### Participants

Participants were undergraduate students from introductory psychology courses at San José State University who signed up for the experiment in exchange for course credit. The study was a 2 (accent: foreign accent or Standard American accent) x 2 (task order: implicit task first/ explicit task first) x 2 (passage order: foreign accent passage first or Standard American passage first) mixed-factorial design, with accent being a within-subject factor, and order and passage order being between-subject factors. One hundred eighty-five students participated and were randomly assigned to one of three foreign accent conditions (Mexican, British, or Chinese). However, 21 participants were dropped from the Chinese accent condition due to a programming error. This resulted in a sample of 164 participants (60 in the Mexican accent condition, 61 in the British accent condition, and 43 in the Chinese accent condition).

Across all three accent conditions, 37.8% were male ( $n=62$ ) and 62.2% were female ( $n=102$ ). Participants ranged from ages 18 to 50 ( $M = 20.66$ ,  $SD = 3.95$ ). The ethnic composition of the sample was as follows: 34.8% Euro-American/White ( $n=57$ ), 31.7% Latino/a ( $n=52$ ), 23.2% Asian ( $n=38$ ), 3.0% African American/Black ( $n=5$ ), 5.5% Other, and 1.8% declined to answer (see table 1 for the distribution of participants' demographics by individual accent conditions).

Table 1

*Descriptive Statistics for Participants by Condition*

| Condition              | Mexican<br>( <i>n</i> = 60) | British<br>( <i>n</i> = 61) | Chinese<br>( <i>n</i> = 43) |
|------------------------|-----------------------------|-----------------------------|-----------------------------|
|                        | <i>Gender (%)</i>           |                             |                             |
| Male                   | 38.3                        | 44.3                        | 27.9                        |
| Female                 | 61.7                        | 55.7                        | 72.1                        |
|                        | <i>Age (%)</i>              |                             |                             |
| Range                  | 18-50                       | 18-30                       | 18-40                       |
| Mean                   | 20.89                       | 20.09                       | 21.13                       |
| S.D.                   | 4.94                        | 2.48                        | 4.05                        |
|                        | <i>Race/Ethnicity (%)</i>   |                             |                             |
| Euro-American/White    | 38.3                        | 34.4                        | 30.2                        |
| Latino/a               | 38.3                        | 34.4                        | 18.6                        |
| Asian                  | 20.0                        | 18.0                        | 34.9                        |
| African American/Black | 0.0                         | 3.3                         | 7.0                         |
| Other                  | 3.3                         | 9.8                         | 7.0                         |
| Decline to answer      | 0.0                         | 0.0                         | 2.3                         |

*Note.* *N*=164. Twenty-one participants from the Chinese condition were dropped from the final data set as a result of a programming error.

## Measures

Several instruments were used to measure implicit and explicit attitudes toward accented and non-accented speech, including Greenwald, McGhee, and Schartz's (1998) Implicit Association Test and Mulac, Hanley, and Prigge's (1974) Speech Dialect Attitudinal Scale.

**Implicit Association Test (IAT).** The IAT was developed by Greenwald, et al. (1998) to measure implicit attitudes. The first IAT studies showed a relatively low correlation between explicit and implicit measures,  $r = .14$ , which the authors used as support for discriminant validity. Although the issue of reliability was not explicitly discussed by Greenwald and colleagues, the evaluative priming method was the previous instrument used to measure implicit attitudes, and the IAT yielded similar results with a larger effect size,  $d = .62$  and  $d = 1.21$ , respectively. In the present study, the IAT was



modified to measure reactions to auditory stimuli (accented speech), as opposed the typical visual stimuli. More detailed explanations of the steps participants took to complete the IAT in the current study will be discussed in the procedures section.

**Speech Dialect Attitudinal Scale (SDAS).** Mulac, et al. (1974) developed the SDAS to measure accent attitudes and perceptions. It is a 21-item 7 point Likert-type scale of bipolar adjectives assessing three dimensions of speech: 1) social intellectual status (e.g., 7 items; 1 = *rich* to 7 = *poor, educated-uneducated, literate-illiterate*), 2) aesthetic qualities (e.g., 8 items; 1 = *pleasing* to 7 = *displeasing, kind-cruel, calm-excitabile*), and 3) dynamism (e.g., 6 items; 1 = *strong* to 7 = *weak, active-passive, aggressive-unaggressive*). The ratings are averaged for each subscale. The study in which Mulac and his colleagues assessed the validity of the SDAS found the interclass reliability for SDAS factor ratings for the audio-taped recorded speeches was .98 for social-intellectual status, .95 for aesthetic quality, and .98 for dynamism. The three factors of the SDAS accounted for 65% of the total variance.

Cronbach's alphas revealed that, in the present study, the socio-intellectual status and aesthetic quality subscales were generally reliable across the accent conditions (alphas = .76 to .85), whereas the dynamism subscale was lower in reliability across the accent conditions (alphas = .41 to .64). Although the dynamism subscale was lower in reliability in comparison to the other subscales of the SDAS, I decided to keep the scale as is and not to make any changes to it because previous studies have shown the SDAS to be reliable.

## Procedure

After signing consent forms, participants were randomly assigned to one of three accent conditions (Mexican, British, or Chinese), sat in front of a computer screen, put on headphones, and listened to an audio-recording of the accented passage (Mexican, British, or Chinese) and the same passage in a Standard American accent. Order of the passages was counterbalanced, such that half of the participants heard the foreign-accented passage first, and the other half heard the Standard American accented passage first. The audio passages were approximately 1 minute in length, the speakers were all female, and were taken from the International Dialects of English Archive website (<http://web.ku.edu/~idea/>; see Appendix A).

After hearing the first passage, participants identified the accent of the speaker and responded to three 7-point Likert type scale questions assessing the intensity of the speaker's accent (1= *No accent*, 7 = *Strong accent*), comprehensibility (1= *Easy to understand*, 5 = *Hard to understand*), and fluency of English (1= *Fluent in English*, 5 = *Not fluent in English*). These measures served as manipulation checks to assess the extent to which participants detected differences between the foreign accented and Standard American accented speakers. Participants then completed the Speech Dialect Attitudinal Scale (SDAS; Mulac et al., 1974) as a measure of their explicit attitudes toward the accents heard.

Next, participants completed the implicit association test (IAT) as a measure of their implicit attitudes toward the accents they heard. Order of the measures was counterbalanced such that half of the participants completed the IAT first, and the other

half heard the passage and completed the SDAS first. The IAT was modified to measure implicit attitudes regarding the foreign-accented and Standard American speakers (see Figure 2). In this experiment, participants were asked to place their right index finger on the “I” key on the keyboard and the left index finger on the “E” key and categorized phrases that were taken from the passages that they had heard in the explicit portion of the experiment (see Appendix B). Participants heard the same phrases given by both the Standard English speaker and the foreign-accented speaker. Participants categorized the auditory stimuli as ACCENT or NO ACCENT using the keyboard keys, “E” for accent and “I” for no accent. Participants then categorized pictures of flowers with GOOD and pictures of insects and spiders with BAD. The categories BAD and GOOD were located in left and right hand corners of the computer monitor, respectively, and participants responded by pressing the appropriate “I” and “E” key.

In the third stage, participants saw pictures of flowers or insects and hear the same audio clips that they heard in Stage 1 in both a Standard American and foreign accented voice and categorized the stimulus as ACCENT OR BAD or NO ACCENT OR GOOD. Stages 1-3 each consisted of 28 trials. The fourth stage asked participants to do the same as in Stage 3, but there were 56 trials. Stage 3 was used as the practice stage, and Stage 4 was used as the testing stage. Stage 5, which consists of 56 trials, was the same as the first stage but the NO ACCENT and ACCENT categories switched positions so that the NO ACCENT category was on the left and the ACCENT category was on the right. This prepared participants for Stages 6 (28 trials) and 7 (56 trials) where the stimuli were the same as stages 3 and 4, but the categories were transposed and appeared as NO ACCENT

OR BAD and ACCENT OR GOOD (see Figure 2). Response latencies (the time it took for participant to categorize the stimuli and error rates (whether the participant categorized the stimuli correctly or incorrectly) were recorded.

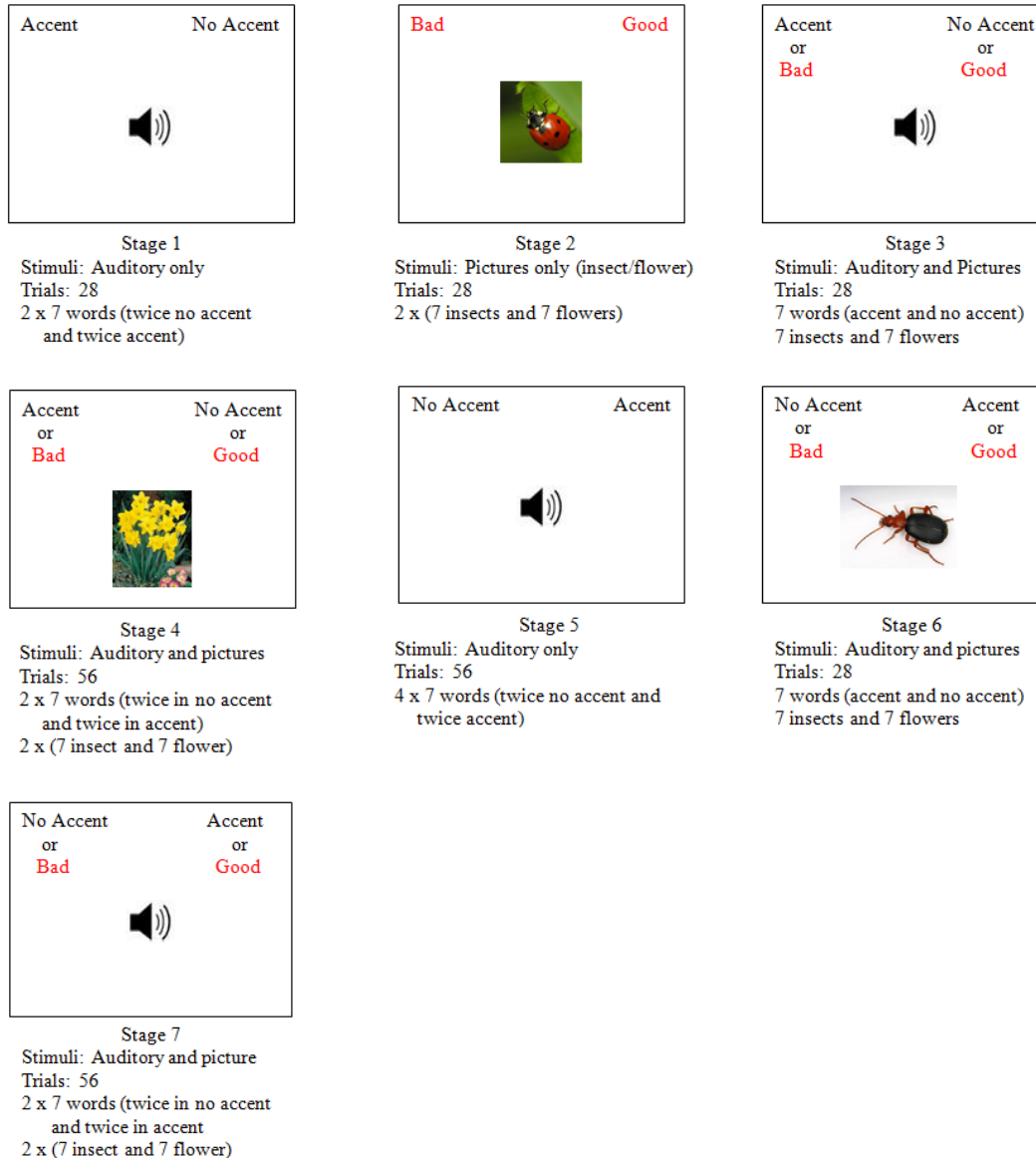


Figure 2. Structure of Implicit Association Test. This figure shows the different stages of the IAT in the current study.

Finally, participants responded to questions regarding demographic information including age, gender, and ethnicity. Included in this portion were questions regarding participants' exposure to foreign languages and accents, whether or not English was their first language, whether they grew up in a multilingual home, whether someone in their family spoke English with an accent, and if someone in their family spoke English with an accent like the accent of the speaker who presented the passage. In addition to being asked about their exposure to accented English in general, participants were also asked to estimate their frequency of exposure to an accent like the accent of the speaker who presented the passage (1= *Daily*, 5= *Almost never*). Finally, participants responded to two 7-point Likert type scale questions assessing their general feelings toward White Americans and the ethnic group of the foreign accented speaker (Mexican, British, or Chinese; 1= *Very unfavorable*, 7= *Very favorable*).

## Results

Results are divided into three sections: the Mexican accent condition, the British accent condition, and the Chinese accent condition. Order was dropped from the analysis because there were generally no significant differences in participants' ratings on the SDAS and response latencies and error rates in the IAT based on whether participants completed the implicit or explicit measure first and whether participants heard the foreign accented passage first or the Standard American accented passage first<sup>1</sup>. Within each

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<sup>1</sup>In the British accent condition, participants who completed the explicit task first were significantly more likely to rate the British accented speaker as less aesthetically pleasing ( $M = 4.72$ ,  $SD = .98$ ) than participants who completed the implicit measure first ( $M = 5.28$ ,  $SD = .95$ ;  $F(1,59) = 5.09$ ,  $p = .03$ ). In

section, results are reported in four subsections: manipulation checks, explicit attitudes, implicit attitudes, and the relationship between implicit and explicit attitudes.

### **Mexican Accent Condition**

Manipulation checks verified that the accent manipulation was successful and participants were able to detect differences between the Standard American-accented speaker and the Mexican-accented speaker. Participants answered three 7-point Likert type scale questions assessing the intensity of the speakers' accents (1 = *no accent*, 7 = *strong accent*), comprehensibility (1 = *easy to understand*, 7 = *hard to understand*), and fluency of English (1 = *fluent in English*, 7 = *not fluent in English*) as manipulation checks. Participants found the Mexican accented speaker ( $M = 5.97$ ,  $SD = 1.34$ ) to have a significantly stronger accent than the Standard American speaker ( $M = 1.35$ ,  $SD = .76$ ),  $t(59) = 23.37$ ,  $p < .001$ . Participants also rated the Mexican accented speaker ( $M = 5.02$ ,  $SD = 1.44$ ) as significantly harder to understand compared to the Standard American speaker ( $M = 1.42$ ,  $SD = .93$ ),  $t(59) = 17.02$ ,  $p < .001$ . Accordingly, participants also rated the Mexican accented speaker ( $M = 4.75$ ,  $SD = 1.62$ ) as significantly less fluent in English relative to the Standard American speaker ( $M = 1.28$ ,  $SD = .69$ ),  $t(59) = 15.87$ ,  $p < .001$  (see Figure 3).

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the Chinese accent condition, participants who completed the explicit measure first had significantly lower error rates in the congruent stage of the IAT ( $M = .04$ ,  $SD = .04$ ) in comparison to participants who completed the implicit measure first ( $M = .07$ ,  $SD = .06$ ;  $F(1,41) = 4.58$ ,  $p = .04$ ).

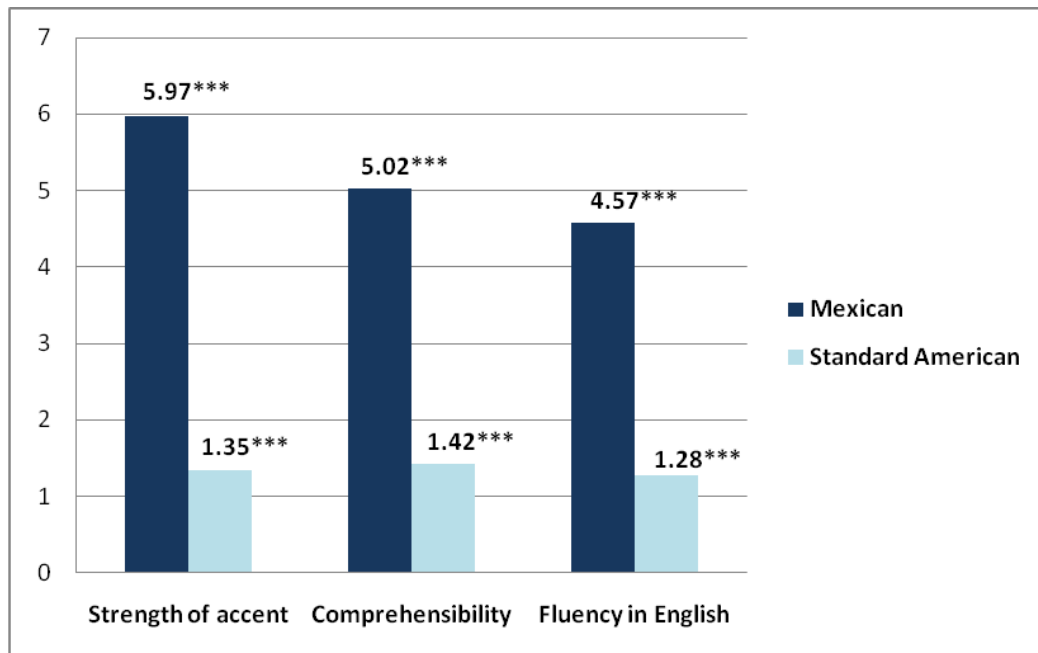


Figure 3. Results of Manipulation Check for Mexican Accent Condition. This figure shows the results of paired-samples *t*-tests in the Mexican accent condition comparing participants' ratings of the Standard American speaker and Mexican accented speaker on three scales: strength of accent, comprehensibility, and fluency in English. \*\*\* $p < .001$ .

When asked to identify the ethnicity/race of the speakers, 68% of participants in the Mexican accent condition correctly identified the foreign accented speaker's accent as "Mexican," "Spanish," or "Hispanic," and 71.2% correctly identified the Standard American speaker's accent as "White," "American," "no accent," or "Standard English."

**Explicit attitudes.** First, I examined whether participants' explicit perceptions of the Mexican accent and the Standard American accent differed. I did this by comparing participants' ratings of the Mexican accented speaker's voice and the Standard American speaker's voice on the three subscales of the SDAS: socio-intellectual status, aesthetic quality, and dynamism. Results from a paired samples *t* test showed that participants perceived the Standard American speaker ( $M = 5.33$ ,  $SD = .76$ ) to be significantly higher in socio-intellectual status than the Mexican accented speaker ( $M = 3.54$ ,  $SD = .90$ ),  $t(59)$

= -11.18,  $p < .001$ ,  $d = 2.15$ . Participants also perceived the Standard American speaker ( $M = 5.83$ ,  $SD = .70$ ) to be significantly higher in aesthetic quality than the Mexican accented speaker ( $M = 4.29$ ,  $SD = .93$ ),  $t(59) = -10.30$ ,  $p < .001$ ,  $d = 1.87$ . However, participants perceived the Mexican accented speaker ( $M = 3.90$ ,  $SD = .73$ ) to be significantly more dynamic than the Standard American speaker ( $M = 3.04$ ,  $SD = .57$ ),  $t(59) = 7.84$ ,  $p < .001$ ,  $d = 1.31$  (see Figure 4).

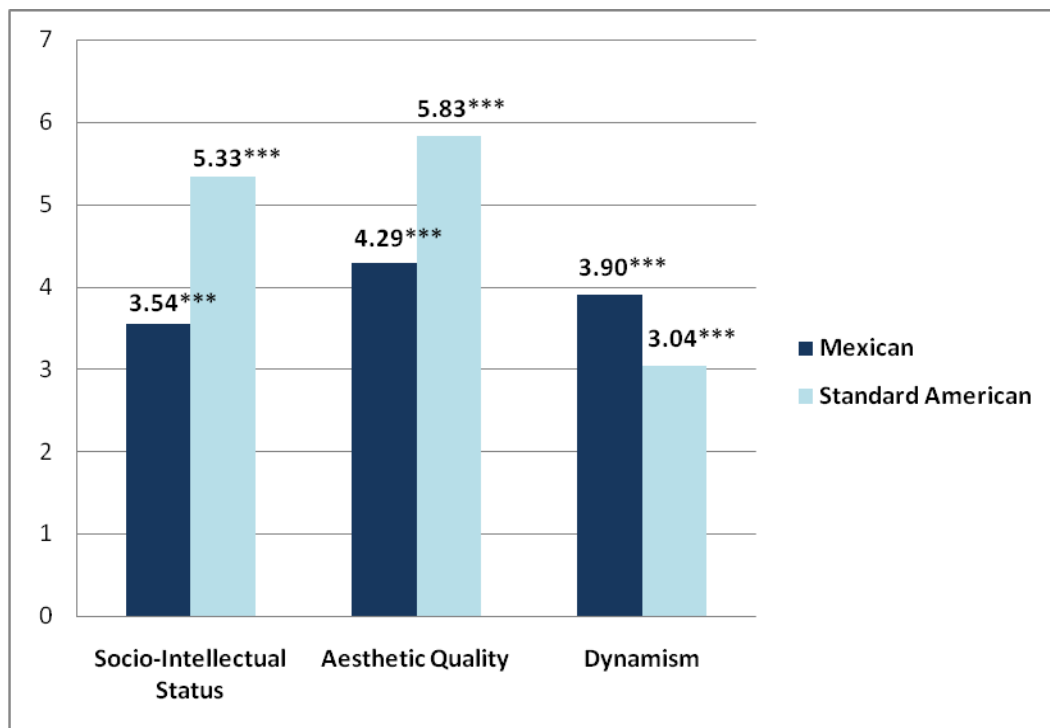


Figure 4. Comparison of Explicit Attitudes Based on the Subscales of the SDAS. This figure illustrates the results of paired-samples  $t$  tests comparing participants' ratings of socio-intellectual status, aesthetic quality, and dynamism between the Standard American speaker and the Mexican accented speaker. \*\*\*  $p < .001$ .

I also investigated the relationship between participants' general feelings toward Mexicans as a social group and White Americans as a social group and their ratings on the SDAS. Participants provided us with their general feelings toward Mexicans and White Americans by rating the groups on a 7-point scale (1=Very unfavorable; 7=Very



*favorable*). A paired-samples *t* test showed that there was not a significant difference between general feelings toward Mexicans ( $M = 4.63, SD = 1.59$ ) and White Americans ( $M = 4.37, SD = 1.34$ ),  $t(59) = -.99, p = .33, d = .18$ . Participants did not report having more explicit favorable feelings toward White Americans when compared to Mexicans and vice versa.

Furthermore, I examined the relationship between explicit measures by running a correlation between general feelings toward Mexicans and White Americans as a social group and SDAS measures. Results from the analysis showed one significant correlation, while all other correlations in the analysis were found to be not significant (see Table 2).

Table 2

*Correlation between General Feelings toward White Americans and the Target Ethnic Group and Ratings on the Subscales of the SDAS*

| General Feelings toward... | <i>Socio-Intellectual Status</i> |                | <i>Aesthetic Quality</i> |                | <i>Dynamism</i>          |                |
|----------------------------|----------------------------------|----------------|--------------------------|----------------|--------------------------|----------------|
|                            | Standard American Accent         | Foreign Accent | Standard American Accent | Foreign Accent | Standard American Accent | Foreign Accent |
| White American             | -.02                             | -.11           | -.05                     | .13            | -.12                     | -.12           |
| Mexican                    | -.02                             | .26*           | -.04                     | .15            | -.03                     | .19            |
| White American             | -.03                             | -.06           | .11                      | -.01           | .09                      | .19            |
| British                    | .06                              | .14            | .26*                     | .14            | .10                      | .22            |
| White American             | .23                              | .08            | .25                      | .16            | -.07                     | -.15           |
| Chinese                    | .22                              | .18            | .23                      | .09            | -.10                     | .07            |

*Note.* For Mexican accent condition,  $n = 60$ . For British accent conditions,  $n = 61$ . For Chinese accent condition ( $n = 43$ ). \*  $p \leq .05$ . All analyses were two-tailed.

The significant correlation suggested that one's general feelings toward Mexicans were significantly correlated with how one rated the Mexican-accented speaker in socio-intellectual status,  $r = .26, p = .05$ . This indicated that, the more favorably participants felt toward Mexicans as a social group, the higher their rating was in socio-intellectual status for the Mexican-accented speaker. Overall, results indicated the general feelings

toward Mexicans and White Americans as social groups were not related to the rating of the speakers' socio-intellectual status, aesthetic quality, or dynamism.

**Implicit Attitudes.** The main purpose of this study was to examine whether or not participants had an implicit foreign accent-bad and Standard American accent-good association. I examined this by comparing categorization reaction times (in milliseconds), error rates, and the IAT effect of participants in the congruent (accent-bad; no accent-good) and incongruent (accent-good; no accent-bad) stages of the IAT.

I hypothesized that reaction times in the IAT would be shorter in the congruent stages than in the incongruent stages of the IAT. Paired samples *t* tests of the reaction times revealed that, indeed, participants did have an implicit association between the Mexican accent with bad and the Standard American accent with good. Participants were significantly faster in categorizing the auditory stimuli in the congruent conditions ( $M = 908.50$ ,  $SD = 206.81$ ) than in the incongruent conditions ( $M = 1018.02$ ,  $SD = 288.67$ ),  $t(59) = -4.38$ ,  $p < .001$ ,  $d = -.44$  (see Figure 5). The results indicated that there was an implicit preference for the Standard American accent relative to the Mexican accent.

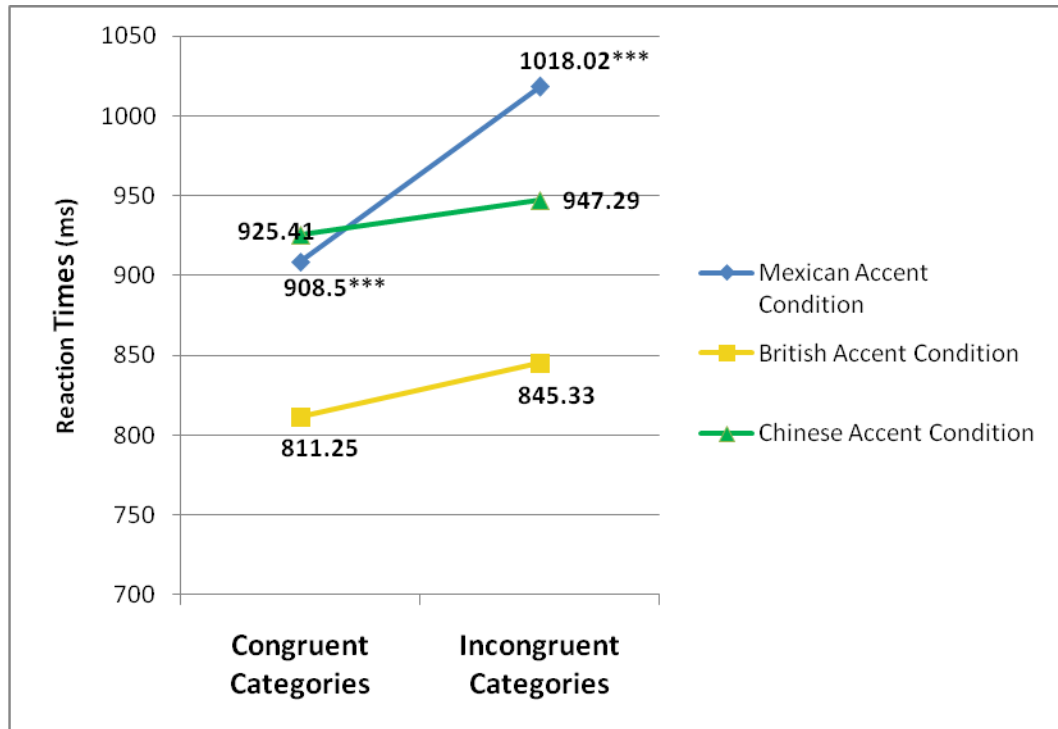


Figure 5. Reaction Times to Auditory Stimuli on the IAT. This figure shows the results of paired-samples *t* tests comparing reaction time to the auditory stimuli of the IAT by accent condition. \*\*\*  $p < .001$ .

In line with the hypothesis that participants would have negative implicit associations toward foreign-accented speakers, paired samples *t* tests revealed that there were significantly more errors in the incongruent condition ( $M = .22$ ,  $SD = .34$ ) than the congruent condition ( $M = .06$ ,  $SD = .12$ ) in regards to the auditory stimuli of the Mexican accent condition,  $t(59) = -3.38$ ,  $p = .001$ ,  $d = .63$  (see Figure 6). This is in line with the hypothesis that when the categories are incongruent, participants are more prone to making errors. That is, participants made fewer errors when they categorized the auditory stimuli into the categories no accent-good and accent-bad than accent-good and no accent-bad, displaying a negative implicit association toward the Mexican-accented speaker.

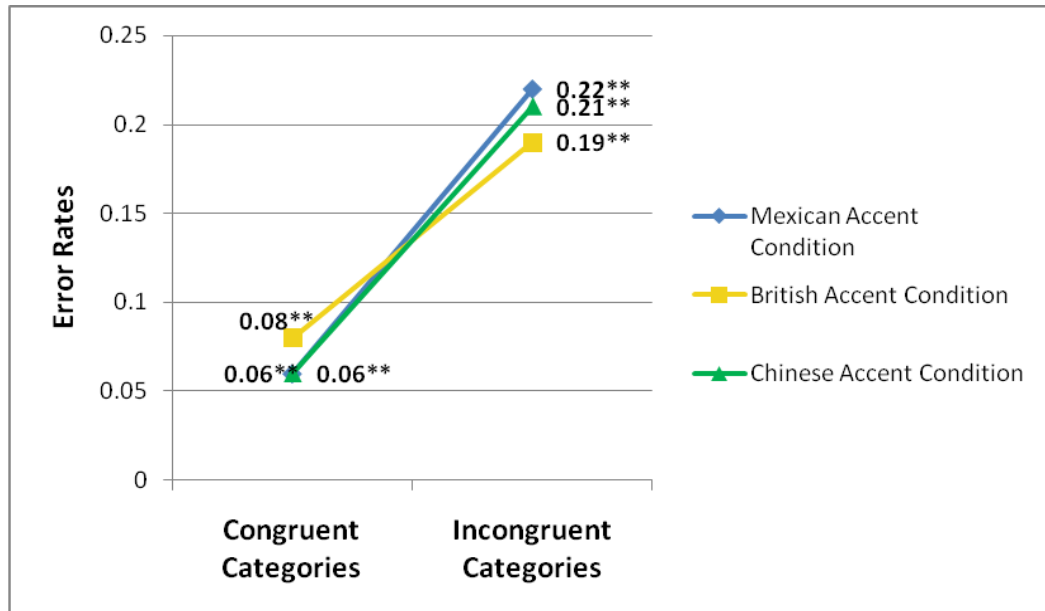


Figure 6. Error Rates on the IAT. This figure displays the results of the paired-samples t tests that compared the error rates between the congruent stage and incongruent stage of the IAT by accent condition. \*\*  $p < .01$ .

I also examined the strength of the implicit association between foreign accent-bad and Standard American accent-good. In order to do this, the IAT effect ( $D$ ), was calculated. The IAT effect,  $D$ , measures the strength of association between the categories no accent-good and accent-bad. A positive  $D$  reflects a preference for the Standard American accented speaker, whereas a negative  $D$  reflects a preference for the foreign-accented speaker.  $D$ s close to zero reflect no preference between the two accents. The IAT effect was calculated using the following formula:  $(M_I - M_C) / [(SD_I + SD_C)/2]$ . Where  $M_I$  = mean reaction times in the incongruent block,  $M_C$  = mean reaction times in the congruent block,  $SD_I$  = standard deviation for the incongruent block, and  $SD_C$  = standard deviations for the congruent block (Greenwald, Nosek, & Banaji, 2003). The calculation of  $D$  is similar to the calculation of Cohen's  $d$ . However, the IAT effect is calculated using the standard deviations computed from participants' reactions times in

both the congruent and incongruent conditions. Conversely, the effect size  $d$  is calculated using a pooled within-condition standard deviation. Greenwald et al. stated that using the standard deviation calculated from both the congruent and incongruent conditions would adjust for underlying individual variability in response times that may exist between the two experimental blocks. Also,  $D$  is calculated for each individual, thus it is able to capture individual differences in implicit attitudes.

When  $D$  was calculated for the Mexican-accent condition, the  $D$  values signified that a majority of participants had a preference for the Standard American speaker compared to the Mexican-accented speaker.  $D$  ranged from -1.00 to 1.16 ( $M = .27$ ,  $SD = .48$ ), 73% of participants had positive  $D$  values, and 27% had negative  $D$  values (see Figure 7).

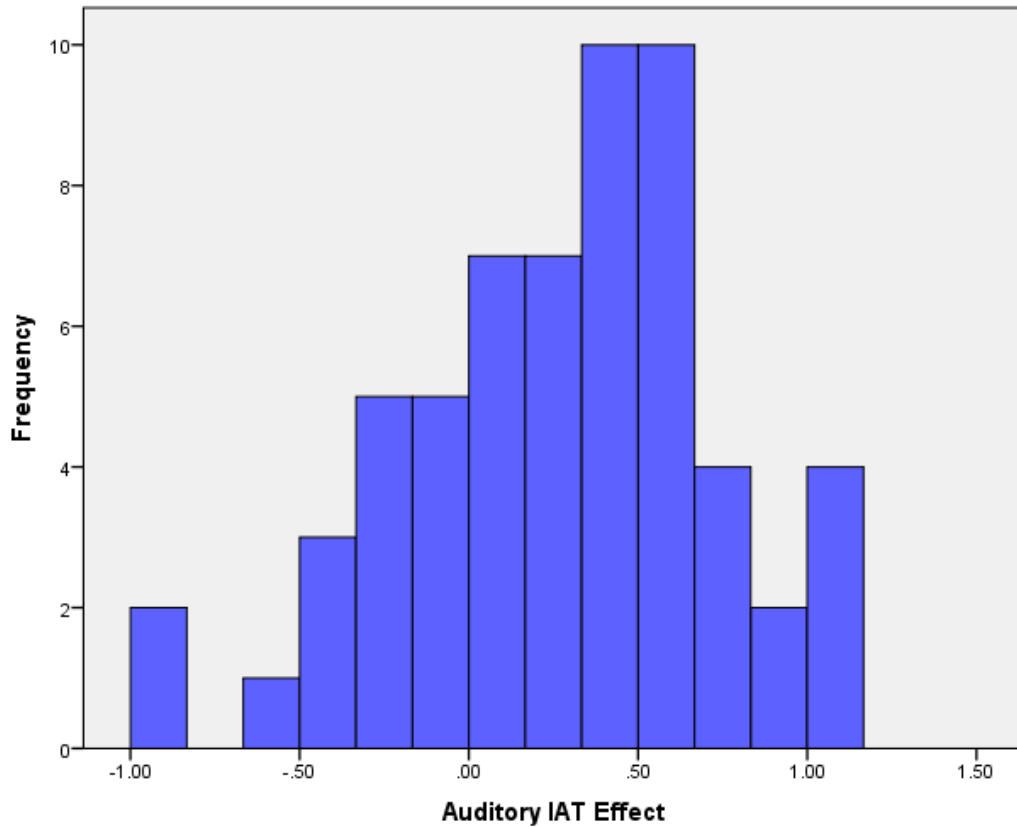


Figure 7. Distribution of the IAT Effect in the Mexican Accent Condition. This figure displays the distribution of  $D_{audio}$  in the Mexican accent condition.

**Relationship between explicit and implicit attitudes.** Another question to explore was the relationship between explicit and implicit attitudes. In order to examine the relationship between participants' implicit and explicit attitudes a Pearson correlation was computed. Generally, implicit and explicit attitudes were independent; that is they did not correlate. First, I examined the relationship between participants' explicit perceptions of the Mexican accent (via ratings on the SDAS) and participants' calculated IAT effect based on response times to the auditory stimuli in the IAT, which will be referred to as  $D_{audio}$ . Results showed that there was not a significant correlation between

participants'  $D_{audio}$  and explicit perceptions of the Mexican-accented speaker's socio-intellectual status, aesthetic quality, or dynamism,  $r(58) < |.20|, p > .13$  (see Table 3).

Table 3

*Correlation between IAT Effect and Ratings on the Subscales of the SDAS*

|                     | <i>Socio-Intellectual Status</i> |                | <i>Aesthetic Quality</i> |                | <i>Dynamism</i>          |                |
|---------------------|----------------------------------|----------------|--------------------------|----------------|--------------------------|----------------|
|                     | Standard American Accent         | Foreign Accent | Standard American Accent | Foreign Accent | Standard American Accent | Foreign Accent |
| Mexican $D_{audio}$ | .11                              | -.20           | .15                      | -.13           | -.17                     | .06            |
| British $D_{audio}$ | .05                              | -.24           | .03                      | -.28*          | .07                      | .22            |
| Chinese $D_{audio}$ | -.05                             | .12            | -.10                     | .19            | .07                      | -.22           |

*Note.* For Mexican accent condition,  $n = 60$ . For British accent conditions,  $n = 61$ . For Chinese accent condition ( $n = 43$ ). \*  $p \leq .05$ . \*\*  $p \leq .01$ . \*\*\*  $p \leq .001$ . All analyses were two-tailed.

Second, I used a Pearson correlation to examine the relationship between participants' explicit ratings of the Standard American speaker on the SDAS and  $D_{audio}$ . Again, results showed that there was not a significant correlation between  $D_{audio}$  and participants' explicit ratings of the Standard American speaker's social intellectual status, aesthetic quality, or dynamism,  $r(58) < |.17|, p > .20$ .

The lack of significant correlations between explicit ratings on the SDAS and the IAT effect demonstrated that although there is an implicit association between no accent/good and accent/bad, this association is not significantly correlated with one's explicit ratings of the Mexican accented speaker and the Standard American speaker on socio-intellectual status, aesthetic quality, and dynamism.

In order to get an overall view of the relationship between implicit and explicit attitudes, I also examined the relationship between  $D$  and participants' general feelings toward Mexicans as a social group and White Americans as a social group. First, I analyzed the correlation between  $D_{audio}$  and participants' general feelings regarding

Mexicans. Results showed that there was not a significant relationship,  $r(58) = -.07, p = .58$ . I then examined the relationship between  $D_{audio}$  and participants' general feelings toward White Americans. This correlation was also not significant, however did have a trend toward significance,  $r(58) = .25, p = .06$ . The results indicated that participants' general feelings toward the Mexican speaker was not related to their implicit dislike of the Mexican accented speaker.

### **British Accent Condition**

**Manipulation Checks.** Manipulations checks verified that the accent manipulation was successful, and participants were able to detect differences between the Standard American-accented speaker and the British-accented speaker in a variety of ways. Participants answered three 7-point Likert type scale questions assessing the intensity of the speakers' accents, comprehensibility, and the speaker's fluency of English as manipulation checks. Participants found the British-accented speaker ( $M = 5.57, SD = 1.35$ ) to have a significantly stronger accent than the Standard American speaker ( $M = 1.36, SD = .98$ ),  $t(60) = 20.49, p < .001$ . Participants also rated the British-accented speaker ( $M = 3.18, SD = 1.73$ ) as significantly harder to understand compared to the Standard American speaker ( $M = 1.49, SD = 1.06$ ),  $t(60) = 6.81, p < .001$ . Accordingly, participants also rated the British-accented speaker ( $M = 2.59, SD = 1.71$ ) as significantly less fluent in English relative to the Standard American speaker ( $M = 1.41, SD = 1.04$ ),  $t(60) = 5.86, p < .001$  (see Figure 8).



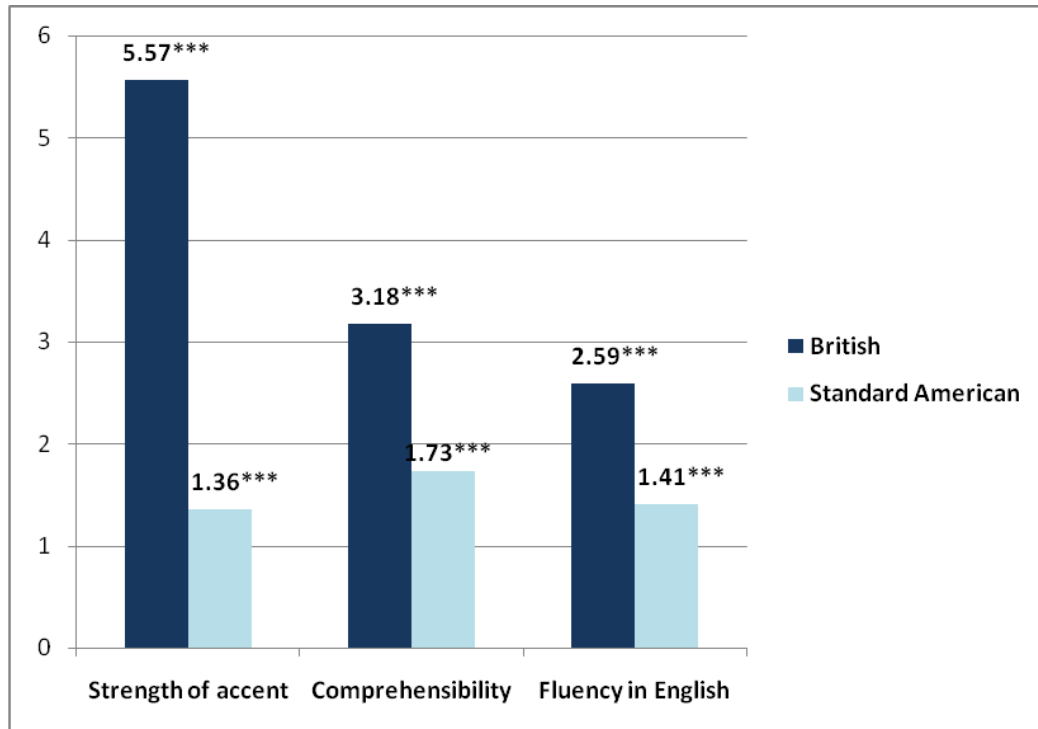


Figure 8. Results of Manipulation Check for British Accent Condition. This figure shows the results of paired-samples *t* tests in the British accent condition comparing participants' ratings of the Standard American speaker and British accented speaker on three scales: strength of accent, comprehensibility, and fluency in English. \*\*\**p* < .001.

When asked to identify the ethnicity/race of the speakers, 49% of participants in the British accent condition correctly identified the British accented speaker's accent as "British," and 79% correctly identified the Standard American accented speaker's accent as "American," "Standard American," or "no accent."

**Explicit attitudes.** I also wanted to examine if participants' explicit perceptions of the British accent and the Standard American accent differed. I did this by comparing participants' ratings of the British-accented speaker's voice and the Standard American speaker's voice on the three subscales of the SDAS: socio-intellectual status, aesthetic quality, and dynamism. Results from a paired samples *t* test showed that participants' perceptions of the Standard American speaker's socio-intellectual status ( $M = 5.02$ ,  $SD =$

1.01) did not significantly differ from their perceptions of the British-accented speaker's socio-intellectual status ( $M = 5.20$ ,  $SD = .90$ ),  $t(60) = 1.37$ ,  $p = .18$ ,  $d = -.19$ . Conversely, participants perceived the Standard American speaker ( $M = 5.65$ ,  $SD = .79$ ) to be significantly higher in aesthetic quality than the British-accented speaker ( $M = 5.00$ ,  $SD = 1.00$ ),  $t(60) = -5.09$ ,  $p < .001$ ,  $d = .72$ . However, participants perceived the British-accented speaker ( $M = 4.12$ ,  $SD = .76$ ) to be significantly more dynamic than the Standard American speaker ( $M = 3.10$ ,  $SD = .93$ ),  $t(60) = 6.07$ ,  $p < .001$ ,  $d = 1.20$  (see Figure 9).

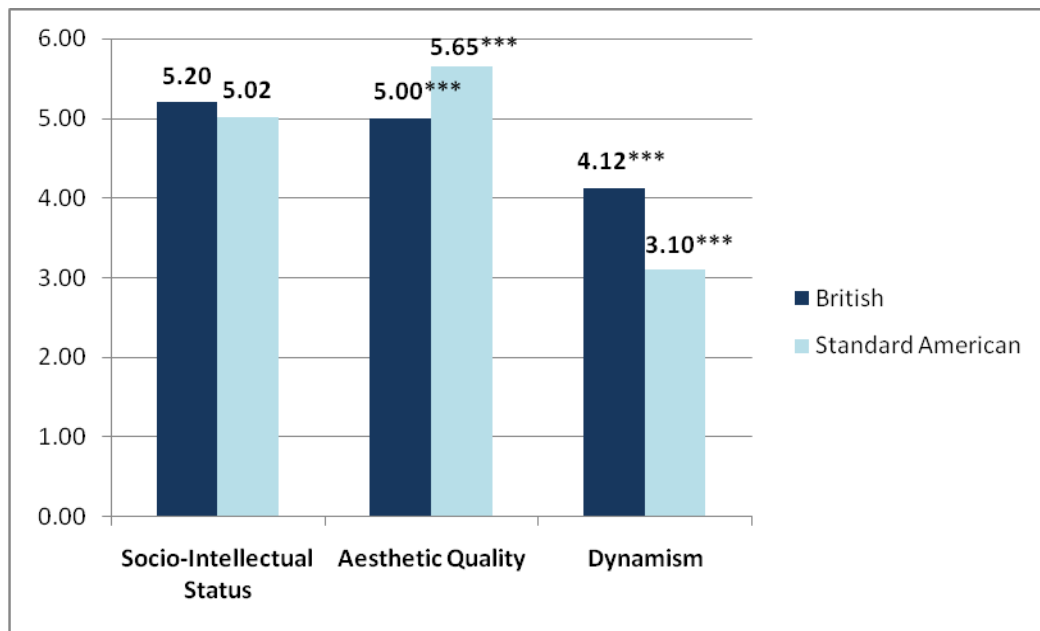


Figure 9. Comparison of Explicit Attitudes Based on the Subscales of the SDAS. This figure illustrates the results of paired-samples  $t$  tests comparing participants' ratings of socio-intellectual status, aesthetic quality, and dynamism between the Standard American speaker and the British accented speaker. \*\*\*  $p < .001$ .

I also investigated participants' general feeling toward British people as a social group and White Americans as a social group. Participants provided their general feelings toward British people and White Americans by rating the groups on a 7-point

scale (1=*Very unfavorable*; 7=*Very favorable*). A paired-samples  $t$  test showed that there was not a significant difference between participants' general feelings toward British people ( $M = 4.48$ ,  $SD = 1.48$ ) and White Americans ( $M = 4.62$ ,  $SD = 1.37$ ),  $t(60) = -1.22$ ,  $p = .23$ ,  $d = -.10$ . Participants did not report having more favorable feelings toward either White Americans or the British when compared to each other.

I also examined the relationship between explicit measures by running a correlation between general feelings toward the British and White Americans as social groups and SDAS measures. Results from the analysis showed one significant correlation, while all other correlations in the analysis were found to be not significant (see Table 2). The significant correlation suggested that general feelings toward the British was significantly correlated with how participants rated the Standard American-accented speaker in aesthetic quality,  $r = .26$ ,  $p = .04$ . The positive relationship indicated that the more favorably participants felt toward the British as a social group, the more aesthetically pleasing they found the Standard American-accented speaker's voice. The overall results imply that general feelings toward the British and White Americans as social groups was largely independent from their perceptions of the speaker.

**Implicit Attitudes.** The main purpose of this study was to examine whether or not participants had an implicit accent-bad and no accent-good association. When  $D$  was calculated using participants' response latencies for the British accent stimuli, it ranged from -1.27 to 1.31 ( $M = .03$ ,  $SD = .61$ ), 52% of participants had positive  $D_{audio}$  values, and 48% had negative  $D_{audio}$  values, which signified that more than half of participants

had a preference for the Standard American speaker when compared to the British-accented speaker (see Figure 10).

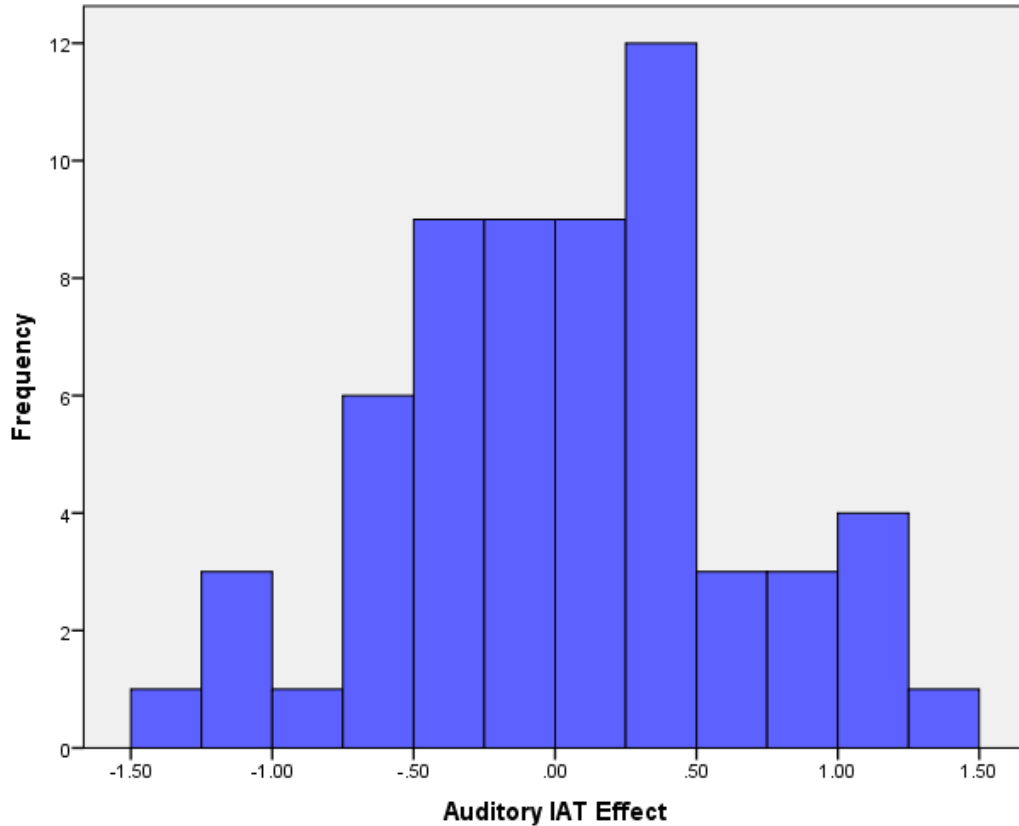


Figure 10. Distribution of the IAT Effect in the British Accent Condition. This figure displays distribution of  $D_{audio}$  in the British accent condition.

I hypothesized that participants would display an implicit preference for the Standard American speaker, thus categorize the auditory stimuli faster in the congruent stages of the IAT in comparison to the incongruent stages of the IAT. I tested this hypothesis by comparing response latencies of participants in the congruent and incongruent stages of the IAT. Paired samples  $t$  tests revealed that participants were not significantly faster in categorizing the auditory stimuli in the congruent conditions ( $M = 811.25$ ,  $SD = 229.54$ ) than the incongruent conditions ( $M = 845.33$ ,  $SD = 292.54$ ),  $t(60) =$

-1.14,  $p = .26$ ,  $d = -.13$  (see Figure 5). This shows that participants did not have an implicit British accent-bad and Standard American accent-good association. In addition to investigating differences in reaction times, I examined differences in error rates between the congruent and incongruent conditions. A paired samples  $t$  test showed significantly more errors in the incongruent condition ( $M = .19$ ,  $SD = .29$ ) than the congruent condition ( $M = .08$ ,  $SD = .11$ ) in regards to the auditory stimuli of the British accent condition,  $t(60) = -3.02$ ,  $p = .004$ ,  $d = .50$  (see Figure 6). Again, this was in line with the hypothesis that when the categories are incongruent, participants are more prone to making errors and display no accent-good and accent-bad implicit associations.

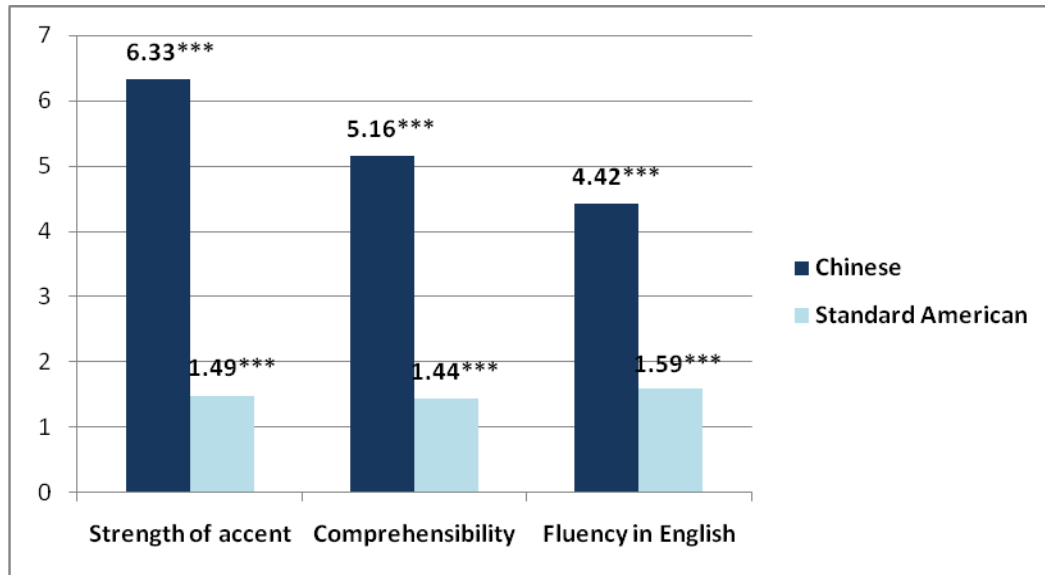
**Relationship between explicit and implicit attitudes.** I then used  $D_{audio}$  and participants' ratings of the British and Standard American accented speaker's voice on the SDAS to conduct a Pearson correlation to examine the relationship between implicit and explicit attitudes. First, I examined the relationship between participants' perceptions of socio-intellectual status, aesthetic quality, and dynamism in regards to the British-accented speaker and  $D_{audio}$ . Results showed that there was not a significant correlation between  $D_{audio}$  and explicit perceptions of the British-accented speaker's socio-intellectual status or dynamism,  $r(59) < -.24$ ,  $p > .06$ . However, results showed that there was a significant relationship between explicit perceptions of the British-accented speaker's aesthetic quality and  $D_{audio}$ ,  $r(59) = -.28$ ,  $p = .03$ . The negative correlation indicated that as the preference for the Standard American accent increased, ratings of aesthetic quality in the British-accented speaker decreased.

Second, I examined the relationship between participants' explicit ratings of the Standard American speaker on the SDAS and  $D_{audio}$ . Results showed that there was not a significant correlation between participants'  $D_{audio}$  and explicit ratings of the Standard American speaker's social intellectual status, aesthetic quality, and dynamism,  $r(59) < .07, p > .59$ . With the exception of the significant relationship between perceptions of aesthetic quality in the British-accented speaker and  $D_{audio}$ , the lack of significant correlations between explicit ratings on the SDAS and the IAT effect demonstrated that although there was an implicit association between no accent/good and accent/bad (as measured by  $D$ ), this association was not significantly correlated with one's explicit ratings of the British-accented speaker and the Standard American speaker's socio-intellectual status, aesthetic quality, and dynamism.

In order to get an overall view of the relationship between implicit and explicit attitudes toward the British-accented and Standard American speaker, I also examined the relationship between  $D$  and participants' general feelings toward British people as a social group and White Americans as a social group. First, I analyzed the correlation between  $D_{audio}$  and general feelings regarding British people. Results showed that general feelings toward the British speaker were not related to their implicit dislike of the British-accented speaker. I then examined the relationship between  $D_{audio}$  and general feelings toward White Americans. This correlation was also not significant,  $r(59) = .17, p = .19$ . The results indicated that there was not a significant relationship between general feelings toward British people and White Americans and their implicit attitudes.

### **Chinese Accent Condition**

**Manipulation Checks.** Manipulation checks verified that the accent manipulation was successful and participants were able to detect differences between the Standard American-accented speaker and the Chinese-accented speaker. Participants answered three 7-point Likert type scale questions assessing the intensity of the speakers' accents, comprehensibility, and the speaker's fluency of English as manipulation checks. Paired samples *t* tests showed that participants found the Chinese-accented speaker ( $M = 6.33$ ,  $SD = .75$ ) to have a significantly stronger accent than the Standard American speaker ( $M = 1.49$ ,  $SD = .98$ ),  $t(42) = 26.14$ ,  $p < .001$ . Participants also rated the Chinese-accented speaker ( $M = 5.16$ ,  $SD = 1.29$ ) as significantly harder to understand compared to the Standard American speaker ( $M = 1.44$ ,  $SD = .77$ ),  $t(42) = 16.25$ ,  $p < .001$ . Accordingly, participants also rated the Chinese-accented speaker ( $M = 4.42$ ,  $SD = 1.58$ ) as significantly less fluent in English relative to the Standard American speaker ( $M = 1.56$ ,  $SD = 1.40$ ),  $t(42) = 8.00$ ,  $p < .001$  (see Figure 11).



*Figure 11.* Results of Manipulation Check for Chinese Accent Condition. This figure shows the results of paired-samples *t* tests in the Chinese accent condition comparing participants' ratings of the Standard American speaker and Chinese accented speaker on three scales: strength of accent, comprehensibility, and fluency in English. \*\*\* $p < .001$ .

When asked to identify the ethnicity/race of the speakers, 51.2% of the participants correctly identified the accent of the Chinese-accented speaker as “Chinese,” and 76.7% of participants correctly identified the accent of the Standard American speaker as “American,” “English,” “No Accent,” or “Caucasian”.

**Explicit attitudes.** I also wanted to examine if explicit perceptions of the Chinese and Standard American-accented speakers differed. I compared ratings of the Chinese-accented speaker's voice and the Standard American speaker's voice on the three subscales of the SDAS: socio-intellectual status, aesthetic quality, and dynamism. Paired samples *t* tests showed that participants perceived the Standard American speaker to be significantly higher in socio-intellectual status ( $M = 5.35$ ,  $SD = .85$ ) than the Chinese-accented speaker ( $M = 3.83$ ,  $SD = .85$ ),  $t(42) = -7.97$ ,  $p < .001$ ,  $d = 1.79$ . Participants also perceived the Standard American speaker ( $M = 5.56$ ,  $SD = .88$ ) to be significantly



higher in aesthetic quality than the Chinese-accented speaker ( $M = 4.39$ ,  $SD = .96$ ),  $t(42) = -6.94$ ,  $p < .001$ ,  $d = 1.27$ . However, there was not a significant difference in perception of the Chinese-accented speaker's dynamism ( $M = 3.55$ ,  $SD = .81$ ) versus that of the Standard American speaker ( $M = 3.41$ ,  $SD = .78$ ),  $t(42) = .67$ ,  $p = .51$ ,  $d = .18$  (see Figure 12).

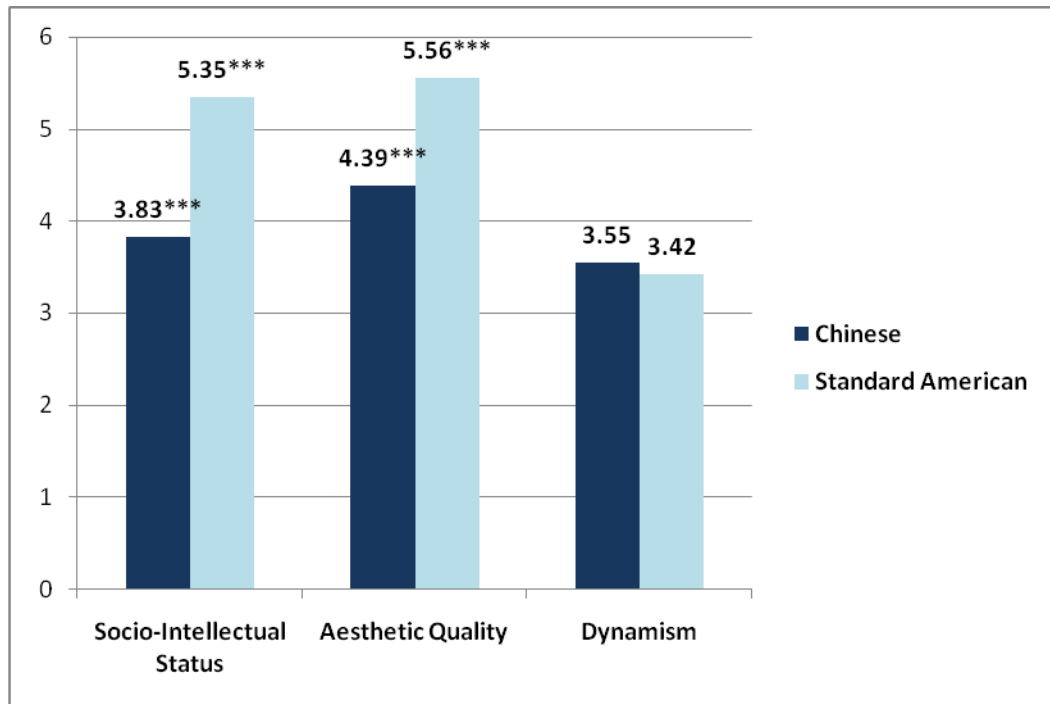


Figure 12. Comparison of Explicit Attitudes Based on the Subscales of the SDAS. This figure illustrates the results of paired-samples  $t$  tests comparing participants' ratings of socio-intellectual status, aesthetic quality, and dynamism between the Standard American speaker and the Chinese accented speaker. \*\*\*  $p < .001$ .

I also investigated general feelings toward Chinese people as a social group and White Americans as a social group. Participants provided us with their general feelings toward Chinese people and White Americans by rating the groups on a 7-point scale (1=Very unfavorable; 7=Very favorable). A paired-samples  $t$  test showed that there was not a significant difference between general feelings toward Chinese people ( $M = 4.30$ ,

$SD = .96$ ) and White Americans ( $M = 4.35$ ,  $SD = 1.19$ ),  $t(42) = -1.22$ ,  $p = .75$ ,  $d = -.05$ . Participants did not have more favorable feelings toward either White Americans or Chinese when compared to each other.

Furthermore, I examined the relationship between the two explicit measures by running a correlation between general feelings toward Chinese and White Americans as a social group and SDAS measures. Results from the analysis showed no significant correlations between how favorable or unfavorable participants felt toward Chinese and White Americans as social groups and their perceptions of socio-intellectual status, aesthetic quality, and dynamism in the speakers (see Table 2). This indicated that the sets of explicit measures are largely independent of each other.

**Implicit Attitudes.** The main purpose of this study was to examine whether or not participants had an implicit association between speaking with an accent with bad and speaking with no accent with good. I examined this relationship by again calculating participants' response latencies to the Chinese accent stimuli ( $D_{audio}$ ). When  $D$  was calculated using participants' response latencies for the Chinese accent stimuli, it ranged from  $-.98$  to  $1.05$  ( $M = .08$ ,  $SD = .48$ ), 53% of participants had positive  $D_{audio}$  values, and 47% had negative  $D_{audio}$  values (see Figure 13) which signified that a more than half of the participants had a preference for the Standard American speaker when compared to the Chinese-accented speaker.

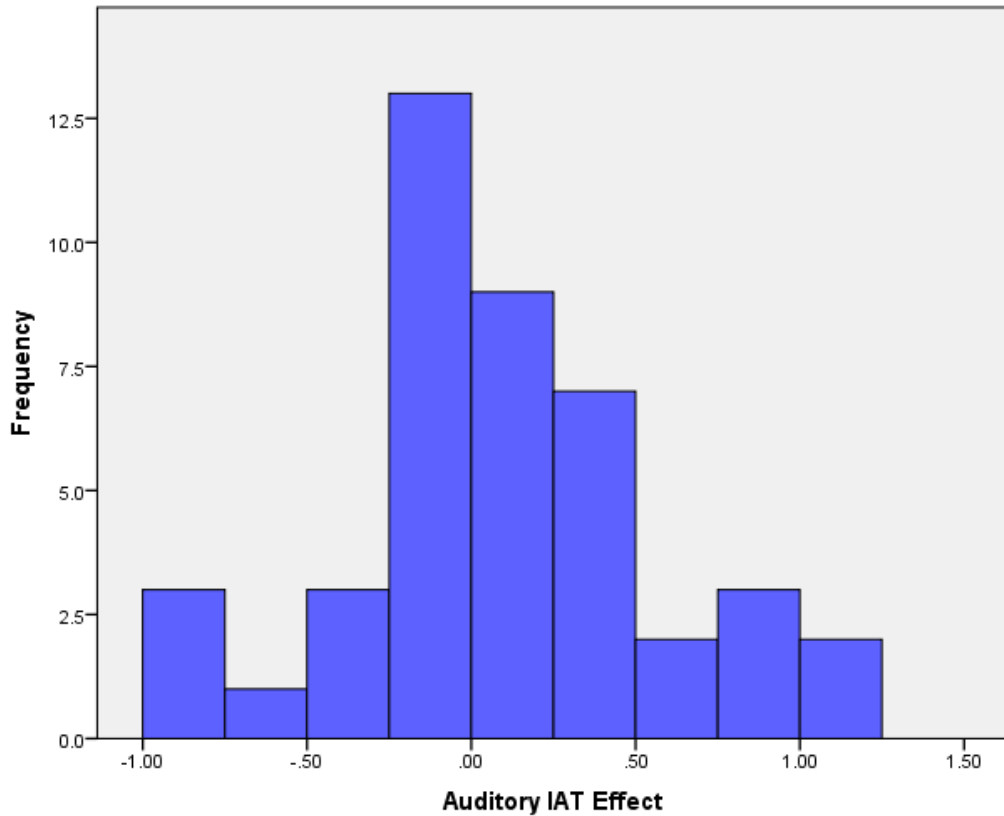


Figure 13. Distribution of the IAT Effect in the Chinese Accent Condition. This figure displays distribution of  $D_{audio}$  in the Chinese accent condition.

I tested my hypothesis that participants would display an implicit preference for the Standard American accented speaker in comparison to the Chinese accented speaker by comparing response latencies of participants in the congruent and incongruent stages of the IAT. Paired samples  $t$  tests revealed that participants did not have an implicit association between the Chinese accent with bad and the Standard American accent with good. Participants were not significantly faster in categorizing the auditory stimuli in the congruent conditions ( $M = 925.41$ ,  $SD = 276.05$ ) than the incongruent conditions ( $M = 947.29$ ,  $SD = 270.19$ ),  $t(42) = -1.03$ ,  $p = .31$ ,  $d = -.08$  (see Figure 5). The results

indicated that there was not an implicit preference for the Standard American-accented speaker or an implicit dislike of the Chinese-accented speaker.

When I examined the differences in error rates between the congruent and incongruent conditions, paired samples  $t$  tests revealed that similar to the other two accent conditions, there were significantly more errors in the incongruent condition ( $M = .21$ ,  $SD = .34$ ) than the congruent condition ( $M = .06$ ,  $SD = .06$ ) in regards to the auditory stimuli of the Chinese accent condition,  $t(42) = -2.84$ ,  $p = .007$ ,  $d = .61$  (see Figure 6). Again, this was in line with the hypothesis that when the categories are incongruent, participants are more prone to making errors.

**Relationship between explicit and implicit attitudes.** In order to examine the relationship between participants' implicit and explicit attitudes, I used  $D$  and participants' ratings of the Chinese and Standard American-accented speaker's voice on the SDAS to conduct a Pearson correlation. Results showed that there was not a significant correlation between participants' explicit perceptions of socio-intellectual status, aesthetic quality, and dynamism in the Chinese-accented speaker and  $D_{audio}$ ,  $r(41) < |.22|$ ,  $p > .15$ . Subsequently, I examined the relationship between participants' explicit ratings of the Standard American speaker on the SDAS and  $D_{audio}$ . Again, results showed that the relationship was not significant,  $r(41) < |.07|$   $-.05$ ,  $p > .65$  (see Table 3). The results show that participants' implicit dislike of the Chinese-accented speaker was not related to their ratings of socio-intellectual status, aesthetic quality, and dynamism of the Chinese-accented speaker's voice. This indicated that although there is a small no accent-good and accent-bad (as measured by  $D$ ) implicit association, this association was

not significantly correlated with one's explicit ratings of the Chinese-accented and Standard American speaker's socio-intellectual status, aesthetic quality, and dynamism.

In order to get an overall view of the relationship between implicit and explicit attitudes toward the Chinese-accented and Standard American speaker, I also examined the relationship between  $D$  and general feelings toward Chinese people as a social group and White Americans as a social group. First, I analyzed the correlation between  $D_{audio}$  and general feelings regarding Chinese people. Results showed that there was not a significant relationship,  $r(41) = .08, p = .61$ . The results showed that participants' general feelings toward the Chinese-accented speaker were not related to their implicit negative attitude toward the Chinese accented speaker.

I then examined the relationship between  $D_{audio}$  and general feelings toward White Americans. This correlation was also not significant,  $r(41) = .09, p = .57$ . The results indicated that there was not a significant relationship between participants' general feelings toward Chinese people and White Americans and their implicit attitudes.

### **Regression Analyses**

I also examined the no accent-good and accent-bad associations while controlling for participant differences in exposure to accents. I used a standard regression analysis with  $D_{audio}$  as the dependent variable and participants' ethnicity, birthplace (in or out of the U.S.), generational status, first language (English or not), whether participants were multilingual, whether participants' family members spoke English with an accent, whether participants' family members spoke English with an accent like that of the accented speaker, the frequency in which they are exposed to accented English, and the

frequency at which they were exposed to accents like that of the speaker as the independent variables. In all three accent conditions, none of the independent variables had a significant relationship with  $D_{audio}$ . In all three accent conditions, the nine independent variables could at most only explain 35% of the variance in the no accent-good and accent-bad associations based on  $D_{audio}$ ,  $R^2 < .35, F < 1.96, p > .08$  (see Table 4). The variance in implicit association of no accent-good and accent-bad could not be explained by self-reported differences in ethnicity, generation status, and exposure to accented speech.

Table 4

*Results of Multiple Regression Analysis by Accent Condition*

| Variable                            | Mexican |       | British |       | Chinese |       |
|-------------------------------------|---------|-------|---------|-------|---------|-------|
|                                     | $\beta$ | $t$   | $\beta$ | $t$   | $\beta$ | $t$   |
| Race / Ethnicity                    | -.01    | -.09  | -.04    | -.27  | -.20    | -1.09 |
| Birthplace                          | -.07    | -.40  | .16     | .84   | .29     | 1.81  |
| Generation                          | -.27    | -1.08 | -.15    | -.54  | -.26    | -.90  |
| First language                      | -.26    | -1.32 | -.28    | -1.73 | -.09    | -.51  |
| Multilingual                        | .17     | 1.00  | .003    | .01   | .27     | 1.34  |
| Family speaks with accent           | .07     | .35   | .08     | .49   | .34     | 1.71  |
| Family speaks with speaker's accent | .07     | .42   | .19     | 1.30  | .17     | 1.06  |
| Exposure to accent                  | .06     | .31   | .10     | .55   | -.17    | -.87  |
| Exposure to speaker's accent        | -.06    | -.28  | -.16    | -.88  | .06     | .35   |
| Multiple Correlation (R)            | .33     |       | .31     |       | .59     |       |
| Adjusted R <sup>2</sup>             | -.05    |       | -.06    |       | .35     |       |
| F-value                             | .68     |       | .60     |       | 1.96    |       |

*Note.* For Mexican accent condition,  $n = 60$ . For British accent conditions,  $n = 61$ . For Chinese accent condition ( $n = 43$ ).

### Post Hoc Analysis

Finally, I conducted a post hoc analysis to compare the IAT effect across the three accent conditions. Results from the one-way ANOVA with a Sidak correction showed that  $D_{audio}$  significantly differed between the three accent conditions,  $F(2, 163) = 3.33, p = .04$ . The significant difference lay between the Mexican accent condition and the British

accent condition, such that  $D_{audio}$  was significantly greater in the Mexican accent condition ( $M = .27, SD = .48$ ) than the British accent condition ( $M = .03, SD = .61$ ),  $p = .04$ . The results indicated that participants had more negative implicit attitudes toward the Mexican accented-speaker in comparison to the British accented-speaker.

### **Discussion**

This study set out to answer three main questions: (a) whether accent-based implicit attitudes could be measured, (b) whether accent-based implicit and explicit attitude were independent of each other, and (c) whether exposure to accented speech decreased negative accent-based implicit and explicit attitudes. In order to answer the first question, auditory stimuli were used in the IAT. The results indicated that the IAT could be used to detect differences in implicit attitudes toward accents. Analysis of the IAT effect ( $D$ ) showed that, across the three accent conditions, the IAT could be used to detect variations in implicit attitudes toward the different accents and a majority of participants had a preference for the Standard American accented speaker in comparison to the foreign accented speakers. Analysis of the response latencies and error rates between the congruent and incongruent conditions of the IAT provided strong evidence for a preference of the Standard American-accented speaker over the Mexican accented-speaker. Conversely, analyses of the response rates and error rates of the IAT in the British and Chinese accent conditions showed mixed results, particularly for the response latencies.

However, analysis of the error rates in all three accent conditions supported the hypothesis of an implicit preference for the Standard American accented speaker over the

foreign-accented speaker. This is in line with my hypothesis that it is more difficult to categorize stimuli when the categories are not implicitly associated with each other (i.e., accent-good and no accent-bad). Although the results were mixed in the British and Chinese accent conditions, these results demonstrate the feasibility of using auditory stimuli in the IAT to detect variations in implicit attitudes toward different accents.

Consistent with my second hypothesis, this preference for the Standard American accented speaker in comparison to the foreign accented speaker was generally not related to explicit attitudes as measured by the SDAS. In other words, one's explicit egalitarian or prejudice attitudes did not necessarily correlate with one's implicit attitudes. When asked to explicitly provide their attitudes toward accented speakers, a person who endorsed egalitarian principles may not necessarily have displayed the same egalitarian values on an implicit measure like the IAT. Thus, examining both implicit and explicit attitudes can provide a more comprehensive understanding of accent-based attitudes and behaviors. In conditions of low cognitive load, explicit measures may be a better predictor of behavior towards foreign accented-speakers, but in conditions of high cognitive load, implicit measures may be a better predictor of behavior towards foreign-accented speakers (particularly immediacy behaviors).

I predicted that exposure to accented speech would decrease negative implicit attitudes toward the foreign-accented speakers, but this was not the case. Preference for the Standard American-accented speaker could not be explained by self-reported differences in ethnicity, generation status, and exposure to accented speech. This may have been due to the context in which participants were exposed to accented speech. For



example, if participants were exposed to accented speech in the classroom or at home and viewed this as a hindrance to their instructors' teaching abilities or their family members' career opportunities, respectively, then increased exposure may not necessarily decrease negative implicit attitudes toward foreign-accented speakers, but may increase it.

Alternatively, if exposure to foreign-accented speech was in a positive context, such as in successful individuals in the community, then negative accent-based implicit attitudes may be reduced. Future studies can further investigate the context in which people are exposed to foreign-accented speech in order to better explain and predict differences in accent-based implicit attitudes.

In addition to the three main questions of this study, I investigated the differences in accent-based attitudes among the three foreign accent conditions to determine if people prefer one accent to others. Results from the implicit and explicit attitude analyses along with the results of the post-hoc analysis demonstrated that implicit accent-based attitudes were not simply based on an accent/no accent dichotomy, but what foreign accent was also plays a role in determining accent-based attitudes. In other words, not only was there a preference for the Standard accented-speaker over the foreign-accented speaker, certain foreign accents were preferable over others (e.g., the British-accented speaker was preferable to Mexican-accented speaker). A possible explanation may be that different accents were associated with different ethnicities/races and were therefore associated with different stereotypes. Different stereotypes may elicit more or less prejudice and in turn impacted implicit attitudes.

Overall, the results showed that the addition of auditory stimuli to the IAT could be used to measure accent-based implicit attitudes. However, there are improvements that future studies can implement that may provide more consistent results. Many accent studies use the matched-guise technique (Lambert, 1967) in order to control for confounding variables that can affect accent-based attitudes, such as volume and speed. The matched-guise technique involves using one speaker who can produce all of the accents of interest. However, this study did not use this technique, so variables such as differences in tone and speed of the speakers may have had an effect on participants' explicit and implicit attitudes. Alternatively, future studies can also better reduce confounds by choosing multiple speakers who naturally speak with the target accents and control for age of the speaker, volume, and speed. Additionally, because the auditory clips were taken from a website (<http://web.ku.edu/~idea/>) where speakers recorded themselves, the quality of the auditory stimuli could have varied across different speakers. Future researchers can record chosen speakers themselves in order to control for this. The current study also did not control for level of accent across the three accent conditions. This may explain the inconsistent results across the accent conditions. Future researchers who expose participants to multiple accents should consider controlling for level of accents across different accents as previous studies have shown that the degree of accentedness (i.e., strong accent, moderate accent, and weak accent) can have an effect on participants' attitudes toward the speakers (e.g., Podberesky, Deluty, & Feldstein, 1990). The current study also only used auditory stimuli produced by

female speakers. Future studies can use both male and female speakers and examine the effect of speaker gender as well as listener gender on accent-based implicit attitudes.

Previous accent studies that only measure explicit attitudes have often come across comprehension as a mediator (e.g., Gill, 1994). However, measuring accent attitudes using the IAT removes this mediator. Participants have to classify only the auditory clip as either accent or no accent without having to understand what is said. This novel application of the IAT will provide accent researchers with a new tool to better understand accent-based attitudes, particularly if and how implicit attitudes relate to explicit attitudes and whether or not accent-based implicit attitudes can predict behavior. Future studies can apply different accents to the IAT, both regional accents as well as different foreign national accents.

With the influx of immigrants coming into the United States and populating the workforce, the issue of prejudice should be further investigated. Research has shown that people with accents do not have trouble finding employment in entry level jobs. However, when it comes to managerial and supervisory positions, people with accents have a hard time getting promoted to and being hired for such positions (Purkiss, Perrewé, Gillespie, Mayes, & Ferris, 2006). Students also tend not to want to take classes from teachers with accents (Rubin & Smith, 1990). According to a census taken in 2005, a higher percentage of college-educated foreign born persons hold post-graduate degrees (43.6%) than native born (35.2%, Batalova, 2005). With this in mind and the influx of off-shore skills coming into the United States, it would behoove us to learn how they are perceived by employers and coworkers in the workplace and by students and fellow

faculty members in the school environment. Therefore, identifying factors such as implicit attitudes that guide such behaviors is important in understanding the motivation behind prejudice behaviors. If in fact accents do affect comprehension, then certain speech classes can be implemented to reduce the strength of accents. Furthermore, identifying certain characteristics in people which may be related to prejudice, such as motivation to inhibit negative stereotype responses, may aid in creating interventions to counter the effects of negative implicit attitudes and help people with accents break the glass ceiling.

The current study demonstrated that it was possible to use auditory stimuli in the IAT, providing researchers with a new medium with which to more thoroughly understand accent-based attitudes and gave a first glimpse into accent-based attitudes and perceptions. Future accent studies can use the IAT to complement and extend existing theories and techniques to explore accent-related stereotyping, prejudice, and discrimination. For example, research can explore whether explicit and implicit accent attitudes differentially impact perceptions of competence and likeability of target persons in various domains (e.g., as a teacher, employer, or potential employee).

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## Appendix A: Passage Used in Explicit Measure

### Comma Gets a Cure

Well, here's a story for you: Sarah Perry was a veterinary nurse who had been working daily at an old zoo in a deserted district of the territory, so she was very happy to start a new job at a superb private practice in North Square near the Duke Street Tower. That area was much nearer for her and more to her liking. Even so, on her first morning, she felt stressed. She ate a bowl of porridge, checked herself in the mirror and washed her face in a hurry. Then she put on a plain yellow dress and a fleece jacket, picked up her kit and headed for work.

When she got there, there was a woman with a goose waiting for her. The woman gave Sarah an official letter from the vet. The letter implied that the animal could be suffering from a rare form of foot and mouth disease, which was surprising, because normally you would only expect to see it in a dog or a goat. Sarah was sentimental, so this made her feel sorry for the beautiful bird.

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## Appendix B: Phrases for the IAT

1. Start a new job
2. Private practice
3. Bowl of porridge
4. Street tower
5. A different idea
6. In no time
7. Singing a tune