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**Measuring implicit and explicit attitudes toward
foreign-accented speech**

by

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ABSTRACT

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The purpose of this research was to investigate the nature of listeners' attitudes toward foreign-accented speech and the manner in which those attitudes are formed. This study measured 165 participants' implicit and explicit attitudes toward US- and foreign-accented audio stimuli. Implicit attitudes were measured with an audio Implicit Association Test. The use of audio stimuli as repeated tokens for their phonological attributes represents an innovation in IAT methodology. Explicit attitudes were elicited through self-report. The explicit task was contextualized as a fictional medical malpractice trial; participants heard the recorded audio testimony of two actors (one US-accented and one Korean-accented) portraying opposing expert witnesses. Four test conditions counterbalanced across participants were created from the recordings. Participants rated the experts on fourteen dependent variables ('traits'): believability, credibility, judgment, knowledge, competence, trustworthiness, likeability, friendliness, expertise, intelligence, warmth, persuasiveness, presentation style, and clarity of presentation. Participants were also asked for their attitudes toward the speakers relative to each other (i.e., Which doctor would you side with in this dispute?). The question of speaker preference was posed as a binary choice, an 11-point slider scale measure, and two confirmation questions asking participants to state how fair they thought an outcome for each party would be.

This study's hypothesis that participants' implicit and explicit attitudes toward the same speech would diverge was confirmed. The IAT results indicated an implicit bias [$D=.33$, $p<.05$] in favor of the US-accented speaker, while the self-report results indicated an explicit bias [$F(2,121)=3.969$, $p=.021$, $\eta^2=.062$] in favor of the foreign-accented speaker in the slider scale and confirmation questions [$F(2,121)=3.708$, $p=.027$, $\eta^2=.058$, and $F(2,121)=3.563$, $p=.031$, $\eta^2=.056$]. While the binary choice question showed a trend toward favoring the foreign-accented speaker, the result was not significant. No discernable pattern was found to exist in attitudes toward the speaker by trait. This study's findings argue for the recognition of both implicit and explicit attitude constructs and the integration of implicit attitudes measurement methodologies into future language attitudes research. Additional theoretical implications of these findings for future language attitudes research are also discussed, including implications for selecting an appropriate cognitive processing model.

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CHAPTER 1

INTRODUCTION

The purpose of this research is to investigate the nature of listeners' attitudes toward foreign-accented speech and the manner in which those attitudes are formed. Language attitudes—reactions to another person's speech—influence a listener's attitudes toward the speaker and the speaker's message (Cargile & Bradac, 2001; Mulac, Hanley & Prigge, 1974; Ryan, 1983). Foreign accent, in particular, has been shown potentially to have a powerful, negative effect on listener judgments and perceptions of speakers, even leading to prejudicial behaviors with adverse legal, social, educational, and economic consequences for foreign-accented speakers (Lippi-Green, 1994; Matsuda, 1991).

Understanding the processes underlying the formation of these attitudes is becoming increasingly important as greater numbers of people worldwide have contact with foreign-accented speakers. International human migration is occurring at a rate never before seen in history. The United Nations estimates that there are 214 million migrants worldwide, a number that has increased nearly 37 percent since 1990.¹ The adult

¹This increase includes a 41 percent increase in Europe and an 80 percent increase in North America. In the US alone, the past 20 years have seen a dramatic increase in immigration. Forty years ago, immigration numbers in the US were so small that the US Census Bureau did not deem it relevant to ask residents where their parents were born. Today, of US residents under the age of 18, one fourth are immigrants or the children of immigrants (DeParle, 2010/2010).

L2 learners, even if they learn to speak their new language with complete grammatical and communicative competence, will speak their second language with a foreign accent.²

Globalization of commerce and industry has created a complexly interconnected world of seamless, and sometimes unwitting, communication across national borders (Blommaert, 2010). Pursuing a customer service issue with a large US-based company will most likely involve an undisclosed international telephone connection and a conversation with a native speaker of Vietnamese, Hindi, or Tagalog. Moreover, as the worldwide ‘stampede toward English’ (de Swaan, 2001) continues, the number foreign-accented L2 English speakers also continues to grow. These speakers, too, will speak English with a foreign accent, and will face reactions based solely on their speech.

The present study approaches the analysis of reactions to foreign-accented speech from a cross-disciplinary perspective, incorporating developments in general attitudes research from the field of psychology into the study of language attitudes. This approach provides a consistent framework for conceptualizing the nature of language attitudes, a methodology for measuring those attitudes, and a comprehensively applicable cognitive model that explains how those attitudes are formed. This study expands on earlier work (the ‘2008 Study’; Pantos & Franklin, 2009) that investigated the effects of foreign accent on attitudes toward expert witnesses and their testimony in the context of a fictional civil trial. In the 2008 Study, a total of 128 participants listened to the recorded audio testimony in English of two physicians, portrayed by two different male actors, one US-accented and the other Korean-accented. Participants compared the witnesses based on

² Contrary to popular misconception, it is extremely difficult, if not impossible, for an adult learner of a second language to learn to speak like a native speaker consistently, regardless of the degree of effort expended (e.g., Lippi-Green, 1997).

seven dependent variables: believability, knowledge, competence, likeability, clarity, presentation style, and dispute outcome. The 2008 Study's results indicated a statistically significant ($p < .01$) bias in favor of the US accent for believability, likeability, clarity, and presentation style, although not for knowledge, competence, or dispute outcome. An overview of the 2008 Study is set out in Section 1.1.

While the 2008 Study highlighted the complexity of explicit listener attitudes toward foreign accented speech, it also confirmed that more work needed to be done to understand the nature and formation of these attitudes. To this end, the current research incorporates recent findings in the domain of *Implicit Social Cognition* (Greenwald et al., 2002) to further examine the effects of different components of the attitude construct on perceptions of foreign accented speech. Specifically, current research examining the formation and effects of *implicit attitudes* (Greenwald & Banaji, 1995) on perception and behavior suggests that attitudes may exist at multiple levels within memory, and may differentially affect subsequent behavior. By measuring both implicit and explicit attitudes, and by exploring explicit attitudes in greater depth, the present study seeks to provide a more complete understanding of the nature of listener reactions to foreign accented speech and to posit a cognitive processing model that can explain how those reactions are formed.

In the current research, *foreign accent* and *non-native accent* are defined as speech that exhibits phonological and prosodic traits not typically associated with native speakers of a language (Reinisch, 2005). Because such traits have their source in an L2 speaker's native language, they can also be characterized as the result of the infiltration of native language phonology into the target language (Lippi-Green, 1997). It should be

noted that it is not within the scope of this study to identify the specific linguistic traits that listeners attend to in determining whether or not an accent is foreign; this research proceeds from the point at which the accent is identified as foreign and attitudes are formed.

In the remainder of this chapter, I provide an overview of the 2008 Study and the existing linguistic and socio-psychological research on language attitudes toward foreign-accented speech. I then discuss the current understanding of attitude formation and the effects of those attitudes on perceptions and behavior by citing studies conducted outside the specific purview of language attitudes and argue for the application of this understanding to language attitudes research. Next, I address implications for methodology and for conceptualizing cognitive models that can explain attitude formation consistent with these approaches. Finally, I state the purposes of the present study, provide an overview of the experimental procedure, and present the research questions and the hypotheses.

1.1 Overview of the 2008 Study

The question addressed in the 2008 Study was whether a witness's foreign accent³—when examined as an isolated, independent variable—is a personal attribute that affects jurors' evaluations of a witness and thus affects the evidentiary value of his or her testimony. The study tested this question in a fictional medical malpractice trial context.

³ For purposes of this study, foreign accent was defined as speech that includes traits not typically associated with native US-English speakers (Reinisch, 2005).

Participants, acting as jurors, heard the fictional, recorded audio testimony of two male actors portraying physician expert witnesses presenting contradictory testimony. Participants then assessed the witnesses relative to each other on six criteria related to factors that comprise the types of opinions jurors typically (Bank, 1982) form about witnesses, referred to as *juror decision factors*: believability, knowledge, competence, likeability, speech clarity, and speech style. A seventh assessment, a meta-decision on case outcome, was also tested.

The specific juror decision factors were chosen based on a large body of previous language attitudes research, discussed more fully in Section 1.2.3, that found listener reactions to foreign accents differ based on the type of speaker trait being analyzed (e.g., Cargile & Giles, 1997; Ryan, 1983; Yzerbyt, Provost & Corneille, 2005). Specifically, that research maintains that speaker traits fall into one of two basic trait dimensions: solidarity (e.g., friendliness, kindness, or warmth) and status (e.g., wealth, competence, or knowledge). Based on that literature, it was hypothesized that participants would indicate a preference for the US-accented speaker for likeability (a solidarity trait), clarity of speech, and presentation style; for competence and knowledge (status traits) and case outcome, however, participants were not expected to demonstrate this same bias. Based on the results from a pilot study, it was further hypothesized that believability would align with the solidarity traits.

1.1.1 The 2008 Study methodology

The two actors portraying the doctors were selected because of their native accents. One of the actors is a native US-English speaker from the mid-Atlantic region,

and the other is a native Korean speaker.⁴ Korean was selected as an appropriate foreign accent for the present study⁵, based on previous research showing that Korean English accents are seldom (approximately eight percent of the time) correctly identified in the US (Lindemann, 2003). The mid-Atlantic US accent was chosen because of its status as a neutral prestige regional dialect in the US (Frumkin, 2000; Frumkin, 2007). Because this study was conducted on a nationwide basis, it was necessary to avoid particularly low- and high-prestige regional US dialects in an effort to minimize the possibility that a regional variety would prejudice participants in one way or another. Both actors read both parts in English using their natural accents. The actors were recorded with an Edirol™ flash recorder (model R-09) using unidirectional lapel microphones in a sound-controlled booth. The sound files were saved in .wav format and were normalized to relative loudness using audio editing software (Audacity™) before being finalized.

⁴ Because one of the dependent variables tested in this study was believability, a matched-guise approach (Lambert, 1967) in which one actor affects different accents was deemed inappropriate. Instead, the actors' natural, native accents were used. The verbal performances of the actors were analyzed to verify minimal difference in acoustic factors—such as pitch variation and fundamental frequency differences—shown to affect perceptions of pleasantness (Eadie & Doyle, 2005; Fridland & Bartlett, 2006) and, at least potentially, other variables in the solidarity dimension, such as likeability. In the recording of the first script, the US-accented actor's pitch range fluctuated between a minimum of 88 Hz to a maximum of 482 Hz, and the Korean-accented actor's pitch range fluctuated between 90 Hz and 457 Hz. In the recording of the second script, the US-accented actor's pitch range fluctuated between a minimum of 87 Hz and 479 Hz, and the Korean-accented actor fluctuated between a minimum of 88 Hz and 397 Hz.

⁵ Participants were not asked to rate the Korean speaker's degree of accentedness in the present study. Previous research has shown that, when comparing US-accented speech to foreign-accented speech, the negative affective consequences attendant to the foreign accent do not necessarily vary with the degree of accentedness or level of intelligibility of the speech (Cargile & Giles, 1997).

A practicing medical malpractice attorney wrote both scripts, which were based on deposition testimony taken from an actual medical malpractice lawsuit.⁶ The scripts deliberately represent two equally plausible opinions regarding the treatment of the patient in the fact situation presented.⁷ In their testimony, the physicians provided contradictory opinions regarding the appropriate medical treatment of a woman during the delivery of her child. The treating physician detailed his course of treatment and explained the rationale for his approach. The expert witness criticized the treating physician's assessment of the patient's condition and the ensuing treatment, which the expert characterized as negligent. To minimize the potential for a sympathetic reaction based on the facts of the case, neither the extent of the child's injuries nor the condition of the child at the time of trial was revealed to participants. The scripts were controlled to neutralize potential differences in length, number of technical terms, language vividness, and displacement.⁸ The complete texts of the physicians' scripts are set out in Appendix A.

Participants were obtained through random-dial telephone solicitation by Knowledge Networks, a private research company authorized by TESS (Time-sharing

⁶ The names and certain identifiable facts were altered to maintain the anonymity of the parties.

⁷ The fictional testimony is based on statements made by physicians in depositions taken during the pretrial discovery phase of an actual medical malpractice case. The facts and name of the doctor mentioned (only one doctor's name is stated in the fictional testimony) were changed to obscure any connection to the actual case.

⁸ The treating physicians testimony was 337 words and the expert witness testimony was 318 words long.

Experiments for the Social Sciences) and Ohio State University.⁹ Of an initial panel of 173 respondents, a total of 128 successfully participated in this nationwide Web-based study. Those participants represented a broad range of ages—from 18 to 85 years old—and had a mean age of 46.6 years old. Of the participants, 52% were female, and 48% were male, and all but 14% had a high school diploma. Seventy-six percent self-identified as Caucasian, 8% as African American, and 7% as Hispanic; the remaining 9% self-identified as bi-racial or ‘other’.

Although participants were randomly assigned to one of four conditions (US-accent defendant doctor—US accent plaintiff’s expert, Korean—Korean, US—Korean, Korean—US), due to the attrition prior to participant responses (potentially due to disinterest, technical issues with the Web survey or other unknown factors), the numbers of respondents to each condition were not equal in size. Similarly, because the methodology was not forced choice, some participants elected not to respond to select survey questions (N=10 refusals). These differences between groups were not found to be statistically significant; consequently, all responses are included in the final analysis. Each participant heard only one of the four conditions. Presentation of testimony was counterbalanced across participants to allow for analysis of both accent and presentation order, to test for a bias for order irrespective of accent. In all versions, the treating physician testified first, followed by the expert witness. The two testimonies were separated by a pause of approximately two seconds.

⁹ Data collected by Time-sharing Experiments for the Social Sciences, NSF Grant 0818839, Jeremy Freese and Penny Visser, Principal Investigators. Time-sharing Experiments for the Social Sciences (TESS) is a National Science Foundation supported project that provides social scientists with new opportunities for original data collection.

The instructions to the participants included a description of the study format. Participants were informed that they would be asked to listen to both testimonies and answer a series of questions about those testimonies. The general topic of the case was revealed to participants in the event they found the topic distasteful and did not wish to proceed with the study. In addition, participants were informed at the outset that they would not be asked to relate details about the medical procedures described, but would be asked for their opinions about the physicians and the testimonies they heard, including:

- (a) Which doctor is more believable¹⁰?
- (b) Which doctor sounds more knowledgeable?
- (c) Which doctor sounds more competent?
- (d) Which doctor do you like better?
- (e) Which doctor's testimony was clearer (less confusing)?
- (f) Which doctor's presentation style did you prefer?
- (g) Which doctor do you think you would side with in this dispute?

Participants responded to the questions by selecting either 'The First Doctor' or 'The Second Doctor'. The decision to force participants to make a binary choice, instead of a scalar evaluation, was considered necessary in the interest of ecological validity; trials are decided in the courtroom by binary decision, and not by degree. Accordingly, instead of providing absolute scalar evaluations for the given criteria for each speaker individually (e.g., ratings from one to seven), participants heard both physicians' testimonies and then selected their preferred testimony for each dependent variable.

¹⁰ The term believability was used instead of credibility in the interest of reading comprehension. Because this was a broad-based study with participants from the general population, a limit of an eighth grade level vocabulary was assumed. Market research indicated that credibility was beyond that limit, so the more generally understood term, 'believability', was used, instead.

1.1.2 The 2008 Study results and discussion

Because these were binary variables, a chi-square analysis of the data was applied.¹¹ A significant bias in favor of the US-accented physician was found in both mixed-accent conditions (Korean/English and English/Korean) for believability (χ^2 [1, N=68] = 6.87, $p = 0.0088$), likeability (χ^2 [1, N=66] = 13.67, $p = 0.0002$), clarity (χ^2 [1, N=67] = 38.97, $p < 0.0001$), and speech style (χ^2 [1, N=67] = 33.20, $p < 0.0001$) indicating a preference for the US accent in those instances. The effect size was large for clarity ($\phi = 0.763$) and speech style ($\phi = 0.704$), and moderate for likeability ($\phi = 0.455$) and believability ($\phi = 0.318$). No significant bias in favor of either physician was found for knowledge (χ^2 [1, N=66] = 4.67), competence (χ^2 [1, N=64] = 4.40) or case outcome (χ^2 [1, N=67] = 3.43). Additionally, no apparent bias for either physician was found based on presentation order as evidenced by no statistically significant differences between the choice of physicians (First Doctor and Second Doctor) in the same-accent conditions (believability (χ^2 [1, N=60] = 2.50), knowledge (χ^2 [1, N=59] = 0.03), competence (χ^2 [1, N=58] = 1.06), likeability (χ^2 [1, N=58] = 1.23), clarity (χ^2 [1, N=60] = 1.50), speech style (χ^2 [1, N=58] = 2.16), and disposition of the case (χ^2 [1, N=59] = 2.98)).¹²

The study results indicate that foreign accent, as an isolated variable, has a significant effect on perceptions of witness believability, likeability, clarity and speech

¹¹ANOVA requires normally distributed, scalar variables.

¹² In addition to analyses of the effect of accent, participant demographic factors were also considered. No consistent bias for any of the constellation of witness factors was found considering participant age group or gender ($p < .01$).

style. These results thus establish that foreign accent influences speaker perceptions, independent of visual cues or information such as gesture or appearance. Of the specific witness assessment factors at issue in this study, the patterning of believability, likeability, clarity of speech and presentation style on the one hand, and knowledge, competence, and case outcome on the other, indicates that non-content factors like foreign accent impact perceptions of the different variables in different ways. These results are consistent with the dichotomous trait dimension (solidarity versus status) analysis advocated by earlier language attitudes research (e.g., Ryan, 1983) as discussed in 1.2.3.

1.1.3 Questions raised by the 2008 Study

The 2008 Study was successful in achieving its goals of testing the applicability of the listener attitude model based on speaker traits to the practical context of the courtroom using a linguistically-sound methodology. By isolating foreign accent as an independent variable, the study's results supported the conclusion that a listener's attitude toward a foreign-accented speaker can vary by the type of trait at issue (i.e., solidarity or status), based solely on the speaker's accent. The study's conclusions are important, particularly in terms of the practical application of linguistic research to the courtroom.

At the same time, the 2008 Study also raised a larger theoretical question about the cause of the attitude variation found: Is trait dimension the only cause of the variation found? Instead of (or in addition to) attitude variation being due to perceptions of the speaker's identity, could variation also occur in the type of attitude evoked within the mind of the listener? The 2008 Study, which focused on speaker trait, did not provide a

means of testing this question. Without a means of testing attitude formation, the issue of positing an appropriate cognitive model to explain the processing of language attitudes also remained unresolved. The present research was conceived in order to provide quantitative evidence to respond to the questions raised by the 2008 Study and left unanswered by the existing language attitudes literature.

1.2 The literature on language attitudes toward foreign-accented speech

Language attitudes research encompasses the study of listener attitudes toward language variation, including variation reflected in regional and social dialects, as well as foreign accents. The present study focuses on attitudes toward foreign-accented speech and defines *attitude* as the ‘global and enduring favorable or unfavorable predispositions to respond toward a stimulus or class of stimuli’ (Ito & Cacioppo, 2007, p. 126). Attitude is thus specifically distinguished from *mood*, which is not enduring (e.g., Cargile & Giles, 1998; Petty, Cacioppo, Sedikides & Strathman, 1988).

Language attitudes research is founded on the concept that language does more than simply convey referential meaning; listeners react not only to message content, but also to the linguistic and extra-linguistic information conveyed with the message (e.g., Bradac, 1990; Bresnahan, Ohashi, Nebashi, Liu & Shearman, 2002; Cargile, Giles, Ryan & Bradac, 1994). These reactions to linguistic variation prompt listeners to differentiate among speakers and groups of speakers, categorize them, and, ultimately, place them in a social hierarchy (e.g., Labov, 1966; Lambert, 1967; Preston, 1989). The language variety associated with the most powerful groups in society regularly is labeled ‘standard’ and

accorded the most overt social prestige, while varieties associated with other groups—like immigrants, ethnic minorities, and the working class—are stigmatized (Lippi-Green, 1994; Matsuda, 1991). This hegemony of the perceived language standard—or *standard language ideology* (Lippi-Green, 1994)—has real social and economic consequences for speakers of non-standard varieties. Foreign-accented speakers of English in the US, for example, have sought legal redress under Title VII of the Civil Rights Act of 1964 (42 United States Code §§2000e-2000e-17 (2010)) for employment discrimination based solely on their accents (Matsuda, 1991; Lippi-Green, 1997). Even many nonnative-accented speakers who have not personally suffered discrimination appear to recognize society's negative reaction to their speech, as evidenced by the large number and apparent economic viability of accent reduction courses (Munro & Derwing, 1995).

Over the past several decades, quantitative language attitudes studies have provided much insight into this bias by analyzing attitudes toward foreign accents of particular identified nationalities. In broad terms, these studies have concluded that the relative prestige accorded an identified foreign accent is directly related to the prestige accorded the country of origin of the speaker (e.g., Ryan, 1983). Further, perceptions of the phonological aesthetics of an accent appear to be tied to beliefs about a speaker's nationality (Giles & Niedzielski, 1998), rather than to an absolute standard of euphony.

Native US-English speakers have been shown to react negatively to a number of different specified foreign accents and speakers, including Mexicans (Frumkin, 2007; Ryan, Carranza & Moffie, 1977), Malaysians (Gill, 1994), Chinese (Cargile, 1997), Lebanese and Germans (Frumkin, 2007), and Italians, Norwegians, and Eastern Europeans (Mulac et al., 1974). In general, these studies confirm that 'nonstandard'

accents are dispreferred (e.g., Lambert, 1967; Rubin & Smith, 1990), and that associations made based on foreign accent generally lead to the disfavoring of the speaker (Brennan & Brennan, 1981a; Brennan & Brennan, 1981b; Giles, 1971; Triandis, Loh & Levin, 1966), even to the point of disliking the speaker and discounting the speaker's message (Ryan, 1982). In fact, the expectation of a foreign accent based on the visual perception of foreignness is enough to trigger an anti-foreign bias and negatively affect comprehension, even where no foreign accent was in fact present (Rubin, 1992; Rubin & Smith, 1990).

1.2.1 Social Identity Theory (SIT) and related theories

Explanations for these negative reactions to foreignness and foreign accents are commonly grounded in Social Identity Theory (SIT; (Tajfel & Turner, 1986/2004), and specifically in its notion of social stereotyping, or attributing to individuals the stereotypical attributes of their identified social groups. Social identity is derived from group membership under SIT (Tajfel, 1988; Tajfel, 1982). To be considered a member of a social group, SIT requires that others recognize and label the individual as a member of the group, and that the individual be aware of and value his or her group membership. SIT is not concerned with personal identity, which is controlled by personality and involves interpersonal dynamics, but only with social identity and intergroup evaluations determined by category-based processes (Brown, 2000). Positive social identity—and, accordingly, positive self-esteem¹³—is achieved through favorably comparing the

¹³ Tajfel's suggestion of a causal link between social identity and self-esteem has been challenged. Some researchers claim that measures of explicit attitude (e.g., self-reports) prove such a link to be unreliable, at best (Turner, Brown & Tajfel, 1979). However,

ingroup to relevant outgroups. This need for positive distinctiveness leads to ingroup bias, or favoritism, in the context of intergroup evaluations (Tajfel, Turner, Hogg & Abrams, 2001; Tajfel, 1982)

Relevant to the current research is the notion that SIT includes intergroup communication as a component of general intergroup behavior (Gudykunst & Ting-Toomey, 1990). Intergroup communication occurs when either party in a social interaction defines self or other in terms of group memberships (Gudykunst & Schmidt, 1987; Harwood, Giles & Palomares, 2005). Numerous language attitudes studies have shown that accent signals group membership status (e.g., Bresnahan & Kim, 1993; Bresnahan et al., 2002; Giles, Hewstone, Ryan & Johnson, 1987; Reid & Giles, 2005; Ryan, 1983; White & Li, 1991). A person's identity is, however, comprised of many group memberships. A listener's focus on one group membership instead of the others depends upon *salience* (Hogg & Turner, 1987). Salience is determined by *accessibility* of a particular aspect of identity and the degree of fit between the identity and the context. Accessibility is determined by the subjective strength of one's identity. Pursuant to this theory, then, a speaker's foreign accent indicates outgroup membership, and recognition of this outgroup membership causes the listener's relevant ingroup identity—nationality—to become highly salient (Cargile & Giles, 1997). Some research suggests further that the degree of salience also depends upon the strength of the listener's own

when tested with measures of implicit attitude (e.g., priming tasks), other researchers have shown that a reliable link in fact does exist, leading them to the conclusion that explicit measures are subject to social desirability factors, while implicit measures are not (Farnham, Greenwald & Banaji, 1999).

identity, which will have a direct effect on the degree of prejudice (Cargile & Giles, 1997).

This social-cognitive account of identity salience is used in Self-Categorization Theory (SCT; Reid, Giles & Harwood, 2005; Turner, 1987). SCT is consistent with SIT, but focuses specifically on social interaction through language as a dynamic process, and addresses intragroup variation as well as intergroup behavior. SCT argues that salience and accessibility (or strength) determine which pieces of social information influence a judgment. The stronger or more accessible a category, the more likely it is to be used to process relevant information (Bargh & Pietromonaco, 1982). By predicting what identities individuals are likely to internalize in different situations based on salience, SCT helps predict attitudes, beliefs, and behavior (Reid et al., 2005). In this way, such phenomena as code-switching and intragroup variation in degree of prejudice can be explained based on identity salience through SCT.

Both theories maintain that a speaker's foreign accent makes the listener's own national identity highly salient; the speaker and the speaker's message are then assessed in the context of the relative identities of the speech participants (Harwood et al., 2005). Lambert (1967) and Robinson (1972) understood this process of speaker evaluations as being based on two sequential steps: identification and stereotyping. Once speech cues are used to identify the speaker's social group membership, the stereotypes associated with that group are then associated with the speaker. Quantitative language attitudes studies have thus used these theories to evaluate listener reactions to foreign accents by nationality, proceeding from the notion that listeners identify and react to the specific national identity of the speaker.

1.2.2 Misidentified, unidentified, and unspecified accents.

Lindemann (2003), Niedzielski (1999), and Preston (1989) have all shown, however, that listeners regularly misidentify speakers' countries or regions of origin. In fact, the general lack of skill among listeners in accurately identifying foreign accents led Lindemann (2003) to conclude that there appears to be a general 'foreign' category for the bias, and that the initial and crucial distinction made by listeners appears to be based on whether or not the speaker is a native speaker, and not on the speaker's national identity. The attribution of specific phonological traits of an accent to an identified nationality is thus not necessary for a biased reaction. Even without being told of the national origin of the speaker (or even that foreign accent is at issue), an anti-foreign accent bias exists. This idea is consistent with other research that argues that accents evoke stereotyped responses without the listener first consciously assigning the speaker to a particular reference group (Milroy & McClenaghan, 1977). It is also consistent with Preston's domestic US-accent research, and in particular with his mapping tasks, that revealed Michiganders' view of the entire US South as the home of 'incorrect' speech without further specificity (Preston, 1989), and Ryan's observation that language competence can be generalized to an overall lack of competence in many areas (Ryan, 1983). Reactions to accent are thus generalized reactions, based on broad, imprecise views of people and groups, and are not necessarily correct or well defined. This same view of generality is also supported by studies that found a correspondence between comprehension and reaction to foreign-accented speech based on strength of accent or intelligibility (Bresnahan et al., 2002), and speech rate (Anderson-Hsieh & Koehler,

1988), two variables not directly related to the relative national identities of the listener and speaker.¹⁴

Accordingly, it is argued here that, irrespective of the national origin of the speaker, a nonnative accent designates the speakers' outgroup status. The speaker's outgroup status, in turn, makes the listener's ingroup (native) status highly salient. That high degree of salience of this ingroup/native identity triggers negatively-biased reactions in the listener toward the outgroup/non-native speaker. Thus, while previous quantitative language attitudes research studied reactions to foreign accented speech in terms of specific social identities (e.g., US versus Mexican), the present study considers the more fundamental distinction between ingroup/native and outgroup/non-native speech. It is argued here that there is a reaction to the foreignness of the accent that occurs immediately and irrespective of the specific foreign nationality of the speaker, which may never be determined, and that this fundamental distinction of 'us' versus 'them' is the most salient and important aspect of immediate reactions to foreign-accented speech.

1.2.3 Variation among reactions to foreign accent

Although reactions to foreign-accented speech generally have been shown to be negative, they have not been shown to be uniform. The quantitative language attitudes research that connects listener reactions to national origin also argues that attitudes toward foreign accents vary based on the type of speaker trait at issue, such as

¹⁴ Although these factors are not directly related to national identity, language ideology theorists would argue that the amount of effort listeners are willing to expend to try to understand an accent may be a function of the relative social prestige of the listener and speaker (e.g., Lippi-Green, 1994).

friendliness, intelligence, kindness, or competence. That research argues that the evaluation of the speaker based on those traits differs predictably by trait type, divisible into two basic judgmental dimensions in forming language attitudes: *solidarity traits* and *status traits* (Ryan, 1983).¹⁵ Traits in the solidarity dimension are thought to include traits such as friendliness and kindness, and those in the status dimension are thought to include traits such as competence and intelligence (e.g., Bradac & Giles, 1991; Cargile et al., 1994; Lindemann, 2005; Ryan, 1982). Evaluations of the same speaker for traits in different dimensions have been shown to vary. Specifically, Cargile and Giles (Cargile & Giles, 1997) found that listeners reacted as positively to a moderately-accented Japanese speaker on status traits as they did to a native American English speaker; however, the American English speaker was rated consistently more highly on solidarity traits. They concluded that negative emotional reactions are associated only with members of outgroups perceived to be less friendly, kind and warm, and not with members of outgroups perceived to be less intelligent, educated, and rich.

Carrying this analysis further, other research found trait dimensions to be complementary and compensatory: high ratings for status traits will necessarily mean low ratings for solidarity traits (Kervyn, Yzerbyt, Judd & Nunes, 2009). A study of French dialects found that Belgian French speakers rated Standard French speakers as more competent than Belgian French speakers, but less warm; the complement was also shown to be true (i.e., that Belgian French speakers were considered less competent, but warmer

¹⁵ Other trait dimensions have been mentioned inconsistently in the literature. For example, *dynamism* (how energetic the speaker's language is perceived to be) has been considered in one study (Cargile & Giles, 1998), but has not been discussed again. The two trait dimensions referred to here as *affective* and *cognitive*, or corresponding terms, have been used consistently.

than Standard French speakers). The researchers concluded that ‘compensatory stereotypes’ between the two groups existed (Yzerbyt et al., 2005).

A theoretical explanation for this conclusion was found in SIT and the Ethnolinguistic Identity Theory (ELIT; Giles & Coupland, 1991), a theory that addresses intergroup relations among ethnicities based on language varieties; ELIT is generally consistent with the concept of a standard language ideology. Based on ELIT, it was reasoned that the standard language variety has strong institutional support and that, as a result, speakers of the standard language variety are considered more competent and enjoy more prestige than non-standard speakers in the status dimension. Speakers of the non-standard variety resort to the solidarity dimension for positive social comparison. Accordingly, the need for positive self-image drives a compensatory pattern (Yzerbyt et al., 2005).

Similar patterns can be seen in sociological research that established the Stereotype Content Model (SCM; Fiske, Cuddy, Glick & Xu, 2002). While SCM does not purport to relate directly to foreign accent or to language at all, but to social judgments in general, and social prejudices in particular, SCM does argue that stereotypes occur in two dimensions, *warmth* and *competence*, and that these dimensions act in concert to form unflattering stereotypes in intergroup relations. Specifically, SCM argues that seemingly positive stereotypical traits are necessarily combined with negative stereotypical traits to form the overall negative stereotype. Thus, elderly people may be viewed stereotypically as warm, but they are also stereotyped as incompetent, creating an overall negative stereotypical assessment of that group. For present purposes, the key contribution of SCM is the reinforcement of SIT’s dual-dimensional structure of

intergroup attitudes, as applied in language attitudes research (e.g., Cargile & Giles, 1997). While the two structures (and labels) are not identical, they are similar and can be said to reinforce the notion that reactions to outgroups are not mono-dimensional, but share the same basic dual-dimensional structure. Based on this body of research establishing and reinforcing the dual-dimensional structure of intergroup attitudes, the present study tests reactions to accent by trait dimension, as well as for overall speaker preference.

In addition to trait dimension, some language attitudes researchers have considered differences in attitudes based on the type of reaction the listener experiences (e.g., Cargile & Giles, 1997), distinguishing them as *affective* and *cognitive* (or *emotional* and *evaluative*). That research argues that listeners react emotionally and cognitively to the accent and message of the speech they hear, forming attitudes toward the speaker based on these reactions that may differ from one another. For example, speech associated with outgroups that rate relatively poorly on the solidarity dimension is subject to negative emotional reactions, regardless of how those outgroups rate on the status dimension (Cargile & Giles, 1997).

While this distinction recognizes the complex nature of attitudes as something other than mono-dimensional, it is not always clear what is meant to be included in the attitude components. Specifically, the use of the term *affect* is used at times to mean ‘emotion’, as in the studies mentioned directly above, and at times to mean ‘mood’. The former is a type of reaction, while the latter is a non-enduring state of mind. *Affect* as ‘mood’ was the subject of a body of psychology research in which the impact of mood on attitude formation was tested (e.g., Petty, Cacioppo & Kasmer, 1988). In those studies,

participant attitudes toward a persuasive message were measured under various conditions, including those that required that participants be subjected to noxious odors (Razran, 1940) extreme temperatures (Griffitt, 1970), and even electric shock (Zanna, Kiesler & Pilkonis, 1970). Researchers were interested in measuring whether and by how much the condition impacted the participant's affect, or mood, and changed the participant's receptiveness to the persuasive message. This use of affect to mean an ephemeral mood as related to receptiveness to a persuasive message is not intended in the present study. Here, affective refers to a type of reaction based on existing associations the individual possesses (also referred to in the literature as emotional or immediate reactions) as contrasted with attitudes formed through thoughtful reflection, as discussed more fully in Section 1.4.3.

The distinctions based on reaction type, however, have never been effectively quantitatively tested in language attitudes studies, using methodologies that measure each type of reaction separately. Additionally, no comprehensive cognitive processing model consistent with this distinction in reaction types has been advanced. For precedent in using methodologies appropriate to the different reaction types or attitudes posited, and for a comprehensive and consistent cognitive model to explain attitude processing, it is necessary to look beyond language attitudes research.

1.3 Attitudes research beyond language: Implicit versus explicit attitudes

Outside the purview of language attitudes research, social psychologists have been studying attitude as a precursor and efficient predictor of behavior for 80 years.

Attitude has been variously characterized as being formed through evaluative processes, impulsive processes, or some combination of both (Gawronski & Bodenhausen, 2006; Greenwald & Banaji, 1995; Strack & Deutsch, 2004). Researchers currently make a distinction between explicit attitudes, which are consciously accessible and can be freely reported by the individual who holds them, and implicit attitudes, which are not consciously accessible and cannot be reported (Greenwald & Banaji, 1995). Implicit attitudes—the initial, immediate responses to an attitude object, based on pre-formed associations and stereotypes—involve components that are unintentionally formed in a relatively effortless fashion, are autonomous, and are difficult to change (Strack & Deutsch, 2004). Many researchers assert that individuals are entirely unaware of their implicit attitudes (Dovidio & Fazio, 1992; Greenwald & Banaji, 1995; De Houwer & De Bruycker, 2007). In contrast, explicit attitudes necessarily result from reflective cognitive processing, and are recognized by the individual who holds them (Wittenbrink & Schwarz, 2007). Explicit attitudes can be a revision or an affirmation of an implicit attitude. Individuals necessarily form an implicit attitude toward an object, but may or may not form an explicit attitude toward that same object, depending upon whether or not the individual expends the additional cognitive effort required to form the explicit attitude.

With the development and widened use of implicit measures of attitudes (Greenwald, McGhee & Schwartz, 1998) has come the realization that implicit measures and explicit measures of attitude for an individual can yield different results for the same attitude-object. Those differences suggest that these measures access related but distinct attitude constructs, and, as such, both may affect judgment and behavior (Rohner &

Björklund, 2006). Accordingly, implicit attitudes and explicit attitudes are now generally recognized as two interrelated, but distinct, attitude constructs.

1.3.1 Methodology and the analysis of affective reactions

Historically, the methods applied by language attitudes researchers attempting to measure reactions to speech have all required participant introspection. These methodologies generally employ personal interviews and questionnaires (e.g., Cargile & Giles, 1997; Frumkin, 2007; Lindemann, 2003),¹⁶ such as the self-assessments associated with matched-guise tests (Lambert, 1967), which traditionally have been, and continue to be, the most prevalent method of measuring language attitudes. Among the limitations to such methodologies requiring introspection, however, are their reliance on the willingness and self-awareness of the participant, and their susceptibility to confounds for strategic responding (e.g., participants might not be willing to admit socially unacceptable attitudes they possess, or they may attempt to create a persona through their answers). More problematic for language attitudes research, however, is that these methods necessarily involve cognitive processes. As such, research that purports to have measured both affective reactions and cognitive reactions using introspective methods has in fact measured only cognitive reactions. Because introspection requires cognitive effort, self-reports cannot measure immediate, affective reactions, or implicit attitudes (Wittenbrink & Schwarz, 2007).

¹⁶ To date, no published sociolinguistic language attitudes or psychology studies on attitudes towards foreign or regionally accented speech have applied an implicit measures methodology. (Campbell-Kibler, 2008) presented a talk at NWAV 37 in which she discussed her unpublished sequential priming tasks research that tested the effects of priming cues on token perception.

In order to be able to measure implicit attitudes and address the foregoing concerns, psychologists have developed two general methodological approaches. The first approach relies on the measurement of physiological reactions in brain activity as revealed through brain scan images. While this methodology addresses the self-awareness issue and avoids strategic responding confounds, it requires specialized equipment and a high level of commitment from the participant, and yields data that are often difficult to interpret definitively.

The second general methodological approach for measuring implicit attitudes involves the assessment of participant performance, specifically response latency, in the course of completing specific tasks. The measurement of response latency is meant to reveal which associations are easiest for the participant to make. This, in turn, indicates which associations are stored in the participant's memory or which association patterns are pre-existing and thus most readily activated. These tasks include sequential priming tasks, in which implicit responses are tested on participants with and without exposure to a stimulus or series of stimuli, and the Implicit Association Test (IAT; Greenwald et al., 1998), which tests associations by asking participants to sort stimuli into concept categories. Because they measure immediate associations, these methods address both the issue of awareness and the risk of strategic responding, without requiring that participants undergo a brain scan. Because priming measures often have low internal consistency and test-retest reliability, and because they have been found to be approximately half as

sensitive as the IAT (Brunel, Tietje & Greenwald, 2004), the IAT was selected for the present research.¹⁷

1.3.2 The Implicit Association Test (IAT; Greenwald, McGhee & Schwartz, 1998)

The IAT assesses implicit attitudes by measuring response latency differences among pairings of concepts. The IAT requires participants to sort stimulus exemplars from four concepts using two response options, each of which is assigned to two of the four concepts (see Section 1.3.2.2., below). The amount of time it takes participants to sort the stimuli is measured in milliseconds. The IAT is based on the assumption that greater association strengths are evidenced by faster performance on categorization tasks (Greenwald, McGhee & Schwartz, 1998; Nosek, Greenwald & Banaji, 2005).

Accordingly, the sorting task should be easier, and therefore take less time, when the concepts that share a response are strongly associated, than when they are not (Nosek, Greenwald & Banaji, 2007). The resulting IAT measures, then, are thought to provide an insight into the participant's immediate, associative processing, and thus reveal the participant's implicit attitudes toward the attitude object (Lane, Banaji, Nosek & Greenwald, 2007).

The IAT is comprised of a series of timed sorting tasks. In the measurement tasks—the tasks that comprise the IAT score—concepts and attributes are paired to form category labels. The idea is that the faster participants are able to sort stimuli into the categories with paired concept-attribute labels, the more closely the concept and attribute

¹⁷ The IAT has also been shown to outperform other implicit measures, such as the affective Simon task (De Houwer & De Bruycker, 2007).

as triggered by the stimulus are associated in the participant's mind. For example, consider an IAT used to measure relative attitudes toward hamburgers and hot dogs. For participants who prefer hamburgers, it should be easier (i.e., faster for them) to sort stimuli into the categories labeled *hamburger + good* and *hot dog + bad*, than into the categories labeled *hamburger + bad* or *hot dog + good*. For participants who prefer hot dogs, the opposite should be true: it should be easier for them to sort stimuli into the categories labeled *hot dog + good* and *hamburger + bad*, than into the category labeled *hot dog + bad* or *hamburger + good*. The stimulus (a picture or word associated with the concept or attribute) triggers the association.

Importantly, IATs bypass introspective analysis. As such, they provide access to attitudes not measurable by explicit methods. Explicit methods necessarily evoke introspection, which requires cognitive processing. Explicit methods cannot, therefore, access a participant's implicit attitude (Nosek et al., 2005), even if the participant wanted to express it (Nosek et al., 2007). As a result, IAT results can differ from explicit measures when the individual is unaware of his or her implicit attitudes toward the object, or when the individual is aware of those attitudes, but rejects them either because they do not conform to a set of personal beliefs or to what is socially acceptable (Baron & Banaji, 2006; Nosek et al., 2007; Westberg, Lundh & Jönsson, 2007). This has been shown to be the case with minority stereotypes, in particular; participants are often reluctant to reveal their attitudes towards minorities, or may not be aware of them (Greenwald et al., 1998).¹⁸

¹⁸ Recently, the predictive validity of the IAT and its ability to tap into unconscious attitudes about race were called into question (Blanton et al., 2009). The criticism was based on a re-analysis of data obtained for an IAT study originally conducted by

It is generally understood that, although they tend to co-vary, implicit and explicit attitudes are distinct attitude constructs and not simply reflective of a difference in methodology (Rohner & Björklund, 2006). Co-variance or correspondence between implicit and explicit measures indicates consistency between the attitude constructs, and increases with lower self-presentation concerns, higher attitude strength, and higher perceived self-group discrepancy (Nosek et al., 2005; Rohner & Björklund, 2006). IAT scores, and thus the individuals' implicit attitudes, are related in a meaningful way to group membership and attitude-related behavior (De Houwer & De Bruycker, 2007; Perugini, 2005; Perugini & Prestwich, 2007). When combined with explicit measures of attitude, IATs thus provide a more complete picture of the participant's attitude toward the attitude object than do explicit measures alone. Accordingly, the present research measures both the participants' implicit and explicit attitudes through the use of IAT and self-report methodologies.

1.3.2.1 Audio IAT

The present research tests for reactions to audio stimuli. The use of audio stimuli represents a departure from the traditional use of visual stimuli for IATs, but was considered necessary to test reactions to speech. Only one previous study using audio

McConnell and Leibold (2001) that suggested a link between unconscious, negative attitudes towards African Americans and racially biased behavior. McConnell and Leibold (2009) responded to the Blanton group, reasserting their original findings, and counter-criticizing the methodology used by Blanton and his colleagues in their re-analysis of the McConnell and Leibold data. For present purposes, the issue of attitude awareness is not central to the research. The IAT is the selected methodology because it measures affective reactions, regardless of whether or not individuals are aware of those reactions.

stimuli for the IAT was found in the course of researching precedence for the present study's methodology (Vande Kamp, 2002). That study tested reactions to sounds (bird and insect noises), computer-generated speech (word tokens), and recorded voices (greetings) for the purpose of measuring attitudes toward birds and insects, gender-power relations, and African Americans. That study established that audio stimuli could be used for the IAT.

In the present study, the stimuli consist of recorded audio tokens of foreign- and US-accented speech. It was anticipated, however, that identification of the accent would occur before the entire stimulus was heard, based on phonological cues from the first milliseconds of exposure to the speech, and that the phonological identification of the stimulus as foreign or US-accented would trigger the cognitive associations that would permit the sorting of the stimulus into the appropriate category. Accordingly, the present study's audio tokens are being used for their accent-related phonological qualities. In this way, the IAT is being adapted specifically for use in language attitudes research.

1.4 Cognitive models of processing

With few exceptions, language attitudes research has largely avoided positing a distinct cognitive model to explain the processing of reactions to foreign-accented speech. Two exceptions are found in the literature: Kristiansen's explanation of the stereotyping of phonological features (Kristiansen, 2001) and Cargile and colleagues' social process model of language attitudes (Cargile & Bradac, 2001; Cargile et al., 1994). Kristiansen's cognitive model focuses on the link between social stereotypes and

language attributes, and specifically on how social stereotypes are attributed to speakers based on accent. By extending the process of social stereotyping to the level of accentual features, Kristiansen connects language attributes to social stereotypes on a phonological level through Prototype Theory, and social stereotypes to the speaker, metonymically. While this conceptualization provides an explanation for the manner in which phonological traits can lead to social stereotyping, it does not address the nature of the listener's reaction, or specifically recognize a distinction between implicit and explicit attitudes (or affective and cognitive reactions). Accordingly, this model does not help explain the role these types of reactions play in the formation of language attitudes.

Cargile and colleagues theorized a model that purports to schematize the process involved in attitude formation. Although the model depicts attitudes as comprised of cognitive, affective and behavioral dispositions (Cargile & Bradac, 2001), the model does not distinguish the mode of processing for each component. Instead, the model implies that processing is the same for all components, even though each may affect perception of the stimulus differently. There is no indication in the model that affective and cognitive reactions are, in fact, manifestations of distinct attitude constructs that are cognitively processed in entirely different ways. Consequently, neither the Kristiansen nor the Cargile model addresses the specific issues raised in the present study regarding implicit and explicit attitude formation. Apart from those two models, the other language attitudes studies that have addressed the cognitive processing of language attitudes (Frumkin, 2007; Sobral Fernández & Prieto Ederra, 1994), have relied on the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986a; Petty & Cacioppo, 1986b) to explain the cognitive processing that underlies reactions to other-accented speech.

1.4.1 Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) and Metacognitive Model (MCM; Petty, Briñol & DeMarree, 2007)

ELM posits that persuasive messages are processed through one of two separate, independent, and distinct routes of processing: a *central route* and a *peripheral route*. Cognitive effort is expended in the processing of messages through the central route, where messages are evaluated on the basis of their content. In contrast, the peripheral route eschews careful consideration, and involves attitude formation based on superficial cues (Petty, Cacioppo, Strathman & Priester, 2005). The elaboration likelihood is the probability that a message will be processed through the central route. A low elaboration likelihood equates with a high probability that the listener will process the persuasive message superficially and without regard to content. While the two routes of processing are independent, they are not exclusive: processing can alternate between the central and peripheral routes, depending on the individual's elaboration likelihood at any given moment. In that way, attitude formation can be the result of both routes of processing (Petty et al., 2005).

Two relevant studies use ELM to explain their results (Frumkin, 2007; Sobral Fernández & Prieto Ederra, 1994). These studies analyzed the combined effect of linguistic and extra-linguistic factors on jurors' assessments of eyewitnesses in the context of mock criminal court trials. Frumkin (2007) considered factors such as specified foreign accent, physical appearance and ethnic identity of foreign eyewitnesses, and Sobral-Fernandez and Prieto Ederra (1994) analyzed specified regional accent, as well as pauses and prosody, on assessments of witnesses, defendant guilt, and sentencing.

Frumkin (Frumkin, 2000; Frumkin, 2007) found that perceptions of particular non-native ethnicities and accents (identified in her study as German, Mexican, and Lebanese) negatively affected eyewitness credibility (believability of the witness), accuracy (believability of the testimony), prestige (social ranking of the witness), and deception (degree to which witness is perceived to be lying). Similarly, Sobral-Fernández and Prieto-Ederra (as cited in Frumkin, 2007) found that ‘foreignness’ at a regional dialect level had an effect on assessments of eyewitnesses and criminal defendants. Mock jurors preferred defendants whose accents marked them as originating from regions closer to the listener than those associated with regions located farther away.¹⁹ Both studies posit that the anomalous language attributes in their studies (foreign accents in Frumkin’s study, extra-regional domestic accents in the other study) created an increased cognitive load and therefore a low likelihood of elaboration, so that the persuasive message—the witness’s testimony—was processed through the peripheral route, without regard to the message content. This peripheral processing explained listeners’ reliance on stereotypes about the speaker’s nationality (i.e., superficial information) to form judgments about the speaker and message.

¹⁹ In research that studied the effect of the regional accent of the accused on perceptions of guilt in mock interviews between police officers and suspects, Seggie (1983) found a significant interaction between accent and crime type, in which British RP speakers were more likely to be found guilty of white-collar crimes, and the speakers with a broad Australian accent were more likely to be found guilty of blue-collar crimes. Dixon and colleagues (2002) replicated the Seggie study in England and found a main effect for speaker accent on determinations of guilt, regardless of the crime type. In contrast, Dixon and Mahoney (2004) found no significant effect for regional accent on attributions of guilt, although accent did significantly effect perceptions of the suspect’s criminality and likelihood of being re-accused for another crime in the future. The Dixon and Seggie studies did not address cognitive processing.

Although ELM might appear to explain the results of these studies, ELM's broader applicability is limited. First, ELM was conceived as a mode to explain attitude formation only in the context of persuasive communications. ELM does not purport to explain attitude formation beyond that specific context. Secondly, ELM is a single-attitude model, created before measures of implicit attitudes were developed and used. As such, ELM does not recognize a distinction between implicit and explicit attitudes, does not specifically associate attitudes or reactions with the processing routes (e.g., explicit attitudes or evaluative reactions with the central route), and does not recognize the possibility that an individual can possess more than one attitude toward the same attitude object simultaneously. Its dual structure allows for attitude formation to switch between processing routes, but does not allow that two different attitudes can be held at one time. Consequently, ELM cannot be used to explain dissociations between implicit and explicit measures of attitudes for the same individual toward the same attitude-object. In fact, ELM's characterization of peripheral processing as a reliance on shortcuts and superficial cues suggests that attitudes formed through the peripheral route are not immediate affective reactions, but less-labored evaluative reactions. It is not clear, therefore, that ELM can even accommodate the existence of implicit attitudes as they are understood at present.

Furthermore, ELM's conceptualization of attitude change is unique. Under ELM, attitude change in the central route is dependent upon the valence and quantity of thoughts directed toward the attitude-object, as well as the confidence the listener has in those thoughts. Attitudes formed through the central route are characterized as easily accessible, persistent and stable over time, resistant to change, and highly predictive of

related behavior (Petty et al., 2005). In contrast, attitudes formed through peripheral route are viewed as less accessible, less persistent, less resistant to change (i.e., more easily changed), and less predictive of relevant behavior. These characterizations are contrary to current thinking about the nature and robustness of implicit and explicit attitudes or affective and evaluative reactions (Gawronski & Bodenhausen, 2006; Greenwald et al., 1998; Strack & Deutsch, 2004). Because implicit attitudes and affective reactions are based on pre-existing associations and patterns, they are viewed as enduring, difficult to change, and predictive of behavior, while explicit attitudes, which are formed dynamically through cognitive processes, are viewed as less persistent, easily changeable, and less predictive of behavior.

Additionally, under ELM, affect induced by an attitude-object is generally considered an inducement to personal relevance, and, therefore, an impetus for central route processing. In such instances of high elaboration likelihood, relevant affective reactions serve as persuasive arguments and are assessed along with other such arguments in attitude formation. If elaboration likelihood is low, however, affect serves as a simple peripheral cue (Petty et al., 1988). In short, ELM allows for affective reactions to prompt either central route or peripheral route processing with no reliable means—other than through the highly variable concept of personal relevance—of predicting which is likely to govern in attitude formation.

In an effort to explain dissociations between implicit and explicit attitudes and still retain the tenets of ELM, Petty and colleagues conceptualized the Metacognitive Model (MCM; Petty & Briñol, 2006; Petty, Briñol & DeMarree, 2007). MCM is a single attitude model that includes the flexibility of allowing for attitude-objects to be linked to

both positive and negative evaluations. These evaluations are stored and activated by stimuli in different contexts. Because both positive and negative evaluations for the same object can be accessed, both implicit and explicit attitude ambivalence is possible under MCM. Under MCM, evaluative judgments can be based on either affect or cognition and stem from central or peripheral routes of processing. These judgments are stored in memory. The important factors for activation under MCM are not whether the underlying process stems from affective or cognitive reactions, but the strength of the evaluative associations and whether they are endorsed. Importantly, MCM assumes that implicit measures do not access only affective reactions, but can also reflect cognitive reactions (Petty et al., 2007).

Thus, although MCM addresses the issue of implicit and explicit measures of attitude, and the possibility of inconsistencies between them, its predictive value is still limited. There is no attempt in MCM to tie attitude measure (implicit or explicit) or reaction type (e.g., affective or cognitive) to a processing system. Instead, either attitude or reaction type can be processed through either route. Consequently, MCM does not recognize the attitude constructs as being the result of different modes of processing, and thus affords no more predictive power than ELM.

As discussed above, the existence of different implicit and explicit measures for the same individual towards the same attitude object indicates that these measures target two different constructs, that these constructs are distinct, and that these constructs are linked to different cognitive processes. To provide an explanation for the existence and divergence of these two types of attitudes, researchers have proposed several models for cognitive processing, most notably the Reflective-Impulsive Model (RIM; Strack &

Deutsch, 2004) and the Associative-Propositional Evaluation Model (APE Model; Gawronski & Bodenhausen, 2006).

1.4.2 The Reflective-Impulsive Model (RIM; Strack & Deutsch, 2004)

RIM is a dual-system and dual-attitude model that characterizes social cognition and behavior as a function of a reflective system (RS) and an impulsive system (IS). This model is more broadly applicable than the domain-specific, dual-route ELM, which purports to describe the processing of only persuasive communications. In contrast, RIM purports to conceptualize the cognitive functions underlying all social judgment and behavior (Deutsch & Strack, 2006).

RIM characterizes the RS and IS as two mutually-interactive but separate systems that operate in distinct ways. Concerned primarily with seeking pleasure and avoiding pain and the basic bodily needs of sleep, nutrition and hydration, the IS instigates behavior by linking stimuli with behavioral patterns established through previously learned associations (Deutsch & Strack, 2006). Operations of the IS are rapid and require little effort. They are, however, also rigid and difficult to change (Strack & Deutsch, 2007). Importantly, the IS is characterized as a conceptual and procedural long-term memory, where associative weights between contents change slowly and gradually (Deutsch & Strack, 2006). In the IS, associative links are formed based on contiguity and similarity (Strack & Deutsch, 2004). Associative clusters are formed when perceptual features, valence and behaviors frequently co-occur. When one association is activated within a cluster, that activation spreads to other parts of the cluster. The IS cannot,

however, generate explicit propositional judgments, nor can it apply abstract concepts such as time or truth (Deutsch & Strack, 2006).

Instead, such higher-level cognitive applications are the purview of the RS, which has complementary features to those of the IS. The RS generates a 'metarepresentation' of the IS, attempting to maintain consistency among the associations made. In the RS, a truth value is assigned to the various individual associations, or connections, which are reconciled with one another (Strack & Deutsch, 2004). Through this meta-process, the RS generates attitudes, judgments and behavior (Deutsch & Strack, 2006). Because the RS requires more cognitive effort than the IS, the processing capacity of the RS is more limited than that of the IS. The RS is subject to distraction at high or low levels of arousal, and is thus presumed to work best at intermediate levels of arousal (Strack & Deutsch, 2004). The RS instigates behavior through an analysis of the desirability and feasibility of a particular action. Behavior does not have to immediately follow a decision, however. Because the RS is capable of intention, behavioral schemas linked to the decision can be activated at a later time. Importantly, the RS must be involved in the creation of explicit judgments and decisions, and for 'correcting' judgments to make them more socially desirable (Deutsch & Strack, 2006).

RIM maintains that these systems operate in parallel and compete for control over a response. The IS is always engaged, while the RS may be disengaged. These systems can thus influence each other. The RS can influence the IS by activating associative clusters while creating propositional representations and by activating behavior once decisions are made. The IS can influence the RS by affecting the accessibility of associative clusters through such things as perception and motivation. The IS can also

affect the RS through emotions, which if high, can disrupt reflection (Deutsch & Strack, 2006; Strack & Deutsch, 2007). If both systems are activated, the RS can apply its knowledge of how the IS works to divert attention from the stimulus and take control from the IS. The IS will control if any of the operating conditions of the RS are not met. In terms of longer-term consequences, the RS can modify the potential for how associations are activated in memory storage (Strack & Deutsch, 2007). Because it is a dual-attitude model that distinguishes the processing systems for each attitude construct, RIM is well-suited to explain divergences between implicit and explicit attitudes toward the same attitude object. As such, RIM can be used to predict which system will be used to process a particular type of attitude or reaction, while ELM cannot. Furthermore, because it explains the processing of attitudes toward all types of messages (not just persuasive messages), RIM is also more consistently and widely applicable than ELM.

1.4.3 The Associative Propositional Evaluation (APE) Model (Gawronski & Bodenhausen, 2006)

Also comprehensive in scope, the APE Model explains cognitive functions and attitude formation through a dual-processing model. Although similar to RIM in terms of its dual structure, the APE Model's focus is on cognitive processing, not on systems or memory storage. According to this model, evaluation responses— affective reactions and evaluative judgments—are formed through either associative or propositional processes. Associative processes are characterized as the immediate affective reactions to a given object, independent of the assignment of truth values. Associative activations are made based on similarity of features proximity in space and time (Gawronski & Bodenhausen,

2007). Because they do not involve determinations of truth, immediate affective reactions can be measured by indirect measures like the IAT and affective priming tasks.

Propositional processes, in contrast, are those that seek to determine the validity of associations, evaluations and beliefs through an analysis of their overall consistency with each other and with other propositions (Gawronski & Bodenhausen, 2007). People tend to form evaluative judgments based on affective reactions. People can also translate an affective reaction into a propositional format, which is then subject to a logical test for validity (Gawronski & Bodenhausen, 2007). Such propositional processes are explicitly endorsed when they are consistent with other salient, relevant propositions. The key distinction between the two processes, then, is their dependence on subjective assessments of truth values.

Under the APE Model, the associative and propositional processes are not mutually independent, but influence one another. Propositional processes influence affective reactions when propositional reasoning activates new evaluative associations. Propositional processing might also activate particular associations in memory. Affective reactions influence propositional processes by typically forming the basis of evaluative judgments. These affective reactions are bypassed when the propositional evaluations they imply are rejected as a valid basis for an evaluative judgment (Gawronski & Bodenhausen, 2007).

Unlike RIM, the APE Model is not technically a dual-attitude model. The APE Model explains dissociations between explicit and implicit measures for the same person for the same attitude-object as resulting from the activation of different associative patterns, depending on the context and pre-existing associations in memory. The APE

Model also does not use social concerns, such as fear of unpopular attitudes, as a basis for determining consistency. Instead, only consistency with other relevant propositions held by the listener is a factor. Under the APE Model, then, implicit measures of attitudes tap into associative processing, and not stored evaluative judgments.

Because this is a dual processing model that specifically designates associative responses as affective, this model is particularly well-suited to language attitudes research (Gawronski, Bodenhausen & Banse, 2005). The APE Model also directly links implicit attitudes with associative processing, and explicit attitudes with propositional processing, providing a comprehensive and consistent structure for analyzing attitude formation, attitude change, and the connection between attitude and behavior (Gawronski & Bodenhausen, 2006). It is also consistent with the characterization of implicit and explicit attitudes in the context of attitude and behavior change, and specifically addresses the use of IAT for accessing associative processes (Gawronski & Bodenhausen, 2005; Gawronski & Bodenhausen, 2007). For all of the foregoing reasons, the present research uses the APE Model to conceptualize cognitive processing.

1.4.4 Implications of models for attitude and behavior change

As discussed above, ELM depicts the central route as the more stable, enduring route of processing. The central route is presented as the route that involves more thoughtful consideration of the merits and faults of the attitude object. As a result, ELM posits that attitudes formed through the central route are less prone to change than are attitudes formed through the peripheral route. The theory characterizes attitudes formed

based on superficial features through the peripheral route as easily changed with the slightest expenditure of cognitive effort.

In contrast, both the APE Model and RIM posit the opposite. Because they are based on existing associations like stereotypes and deeply-held beliefs, immediate, impulsive, associative reactions are stable and highly resistant to change. Thoughtful, propositional, reflective reactions are changed easily with additional information. This characterization of stereotypical associations as being more enduring than those created dynamically through thoughtful reflection is consistent with the characterization of implicit and explicit attitudes. Implicit attitudes are immediate reactions based on existing and easily-accessible mental associations. Explicit attitudes are formed through the application of thoughtful processes.

The choice of models thus has an impact not only on how attitudes are thought to be formed, but also on views of how they may be changed. ELM suggests that overcoming stereotypes related to foreign accent would be easily accomplished by raising the issue of foreign status to the level of consciousness in the listener, and encouraging the listener to disregard the accent and focus on the message. The APE Model and RIM, in contrast, posit that changing such deeply held stereotypes and beliefs cannot be accomplished merely by raising the issue of foreignness to the level of consciousness, but that a considerable amount of additional effort must be expended to accomplish that change.

1.5 Theoretical and methodological conclusions drawn from previous research

The present study tests the effect of unspecified foreign accented speech on language attitudes. Exploring reactions beyond those limited to specific nationalities, this study applies the fundamental concepts of intergroup communication from SIT, SCM, and ELIT to study immediate reactions to unspecified foreign accented speech with an audio IAT.

Based on the language attitudes research discussed above, the present research also tests explicit reactions to foreign accented speech using the trait dimension structure—and specifically the distinction between solidarity and status traits—for describing differences in reactions to foreign accented speech. Although both RIM and the APE Model could be used, the APE Model was selected as the cognitive basis of the present research primarily because of the significant amount of research that supports its use with the IAT methodology (Gawronski & Bodenhausen, 2006; Gawronski & Bodenhausen, 2007). Because they are single attitude models that do not suggest separate processing of implicit and explicit attitudes, ELM and MCM are deemed inappropriate for present purposes. This is a stark departure from the only other studies conducted on the affect of language attributes on witness assessments, which relied exclusively on ELM to explain their results (Frumkin, 2007; Sobral Fernández & Prieto Ederra, 1994).

1.6 Purpose and overview of the current study

This study measures participants' implicit and explicit attitudes toward the same speaker. Comprising three segments—an audio IAT, a self-report explicit measure, and a confirmation task—this study seeks to define quantitatively listeners' reactions to foreign

accented speech. The IAT measures reactions to short audio segments excerpted from the audio stimuli used in the explicit task. As in the 2008 Study, the explicit task in the present study is set in the context of a hypothetical medical malpractice trial. Participants were asked to imagine that they were jurors listening to the recorded audio testimony of two expert witnesses, one testifying on behalf of the defendant (the practicing physician), and the other on behalf of the plaintiff (the aggrieved party). The witnesses were portrayed by two male actors, one a native US-accented speaker, and the other a native Korean speaker. Unlike the 2008 Study, however, participants rated the speaker on the basis of 14 traits immediately after hearing each witness's testimony. In addition, after hearing both witnesses testify, participants rated the witnesses relative to each other. In the final task, participants rated their perceptions of fairness of a result in favor of each side in the dispute. The present research hopes to add to the existing body of research by applying the IAT methodology to language attitudes research. By measuring both implicit and explicit attitudes to foreign accented speech, and analyzing the results within the framework of language attitudes research's trait dimension structure and applying the APE Model to explain cognitive processing, this research seeks to provide the fields of sociolinguistics and psychology with a more complete understanding of how listeners react to foreign-accented speech.

1.7 Research questions and hypotheses

Given the foregoing, the current research seeks to answer the following research questions:

Q1: Whether implicit and explicit attitudes toward the same accented speech diverge, indicating that these are different attitude constructs.

Q2: Whether explicit attitudes toward the individual speaker traits fall within the trait dimension analysis suggested by earlier quantitative language attitudes research.

With regard to these research questions, it is hypothesized that:

H1: Implicit and explicit attitudes toward the same speech will be seen to diverge, based on accent, with a bias toward the US-accented speech for implicit attitudes, but no bias for explicit attitudes.

H2: Traits in the solidarity dimension will favor the US-accented speech and those in the status dimension will be ambivalent, confirming the validity of the two-dimension framework for analyzing and explaining explicit attitudes toward foreign-accented speech.

1.8 Conclusion

Understanding listener reactions to foreign-accented speech has never been more critical. The numbers of people impacted, as well as the seriousness of political consequences for foreigners worldwide, underscore the importance of this issue. Although a rich body of language attitudes research has established that reactions to foreign-accented speech are complex, attributing variation to both speaker trait (i.e., status versus solidarity) and reaction type (i.e., affective versus cognitive), a clear and consistent definition of these variables, and a quantitatively-tested explanation of attitude

processing remain elusive. Furthermore, more recent general attitudes research from the field of psychology has shown that the methodologies traditionally used by linguists and social psychologists to measure language attitudes—self-reports and interviews—access only thoughtful evaluative reactions and ignore immediate affective reactions.

By applying methodologies from psychology attitudes research to the field of linguistics, this study hopes to provide a clear understanding of the nature of listener attitudes toward foreign-accented speakers. Specifically, this study measures both the implicit (immediate) and explicit (thoughtful) attitudes of listeners toward the same foreign-accented speech, using an innovative audio IAT to measure the implicit attitudes and self-reports to measure the explicit attitudes. In addition, this study tests the trait-dimension analysis for explicit measures. It is hoped that the quantitative results of this study will provide a better understanding of the nature of listener attitudes toward foreign-accented speech, a stronger argument in favor of an appropriate cognitive processing model, and a clearer direction for instigating prejudicial attitude and behavior change in the future.

CHAPTER 2

METHODOLOGY

In order to assess participants' reactions to foreign-accented speech in terms of both implicit and explicit attitude constructs, this study was comprised of three tasks that measured participants' reactions to the audio stimuli using two distinct methods. An Implicit Association Test (IAT; Greenwald et al., 1998) was used to measure implicit attitudes, the affective reactions based on the immediately activated stereotypes and associates participants possess. Self-reports, which require introspection, were used to measure participants' explicit attitudes, the cognitive reactions formed through propositional processes determining the consistency of the participants' associative reactions with respect to other propositions held. As reflected in Figure 1, the IAT comprised Task 1. Self-reports comprised Tasks 2 and 3. The specifics of the individual tasks are discussed in Section 2.4.

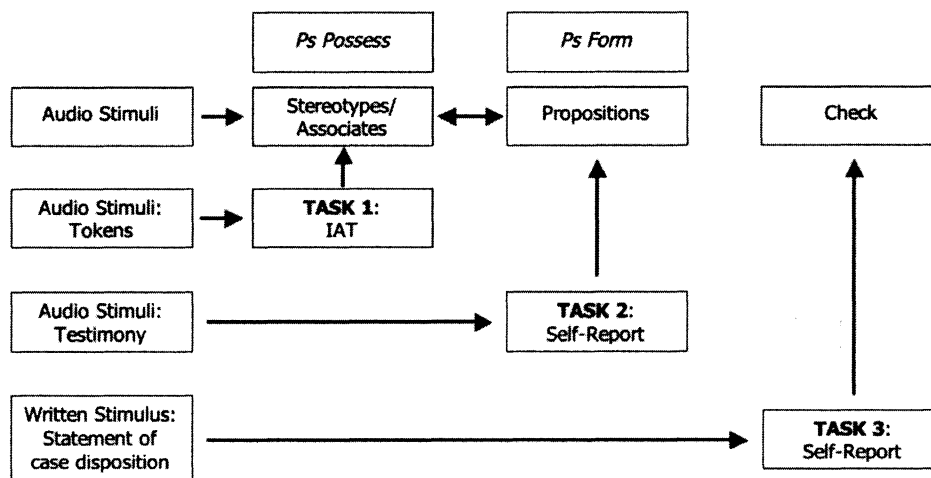


Figure 1: Overview of the experimental procedure

2.1 The Participants

A power analysis indicated that a total of 48 subjects would be needed. A total of 165 subjects participated in this study. Participants were solicited from the undergraduate student population of Rice University, primarily in introductory linguistics classes.

Participation was voluntary. Students received either extra credit or \$10 in compensation.

Participants' ages ranged from 17 to 22 years old, with a mean age of 20 years old. Over twice as many women (114) as men (51) participated. The age, sex, race, and nationality demographics of the participants are set out in Table 1.

Summary of Participant Demographics		
Age (in years)	Range	17–22
	Mean	20
Sex	Women	114
	Men	51
Race (self-identified)	Caucasian/White/European	63
	Asian/Chinese/Taiwanese	40
	Hispanic/Mexican/Latino	20
	African/AA/Black	17
	Mixed	16
	Indian (Asian)/Pakistani	4
	Other	5
Nationality (self-identified)	US/American	131
	Chinese	16
	Korean	4
	Mexican	4
	El Salvadoran	2
	English	2
	Other	6
Total Number of Participants	N =	165

Table 1: Participant age, sex, race, and nationality demographics

2.1.1 Participant background demographics

Because this study involved reactions to accent, and specifically to foreign accent as an indication of outgroup status, information about the participants' parents and language experience was collected. Of the 165 participants, 78 had fathers who were not born in the US. Of those foreign-born fathers, 30 were identified by the participants as being from China, Hong Kong, or Taiwan. Six were identified as being from Korea or South Korea. Fourteen of those 78 fathers have never been to the US. Just over half of the participants' mothers (83 of 165) were born outside the US. Of those 83 foreign-born mothers, 34 were reported to have been born in China, Hong Kong, or Taiwan. Seven were born in Korea. Twelve of the participants' mothers have never been to the US. A summary of the nationalities of the participants' parents is set out in Table 2.

Nationality of Participants' Parents					
	National Origin	No.	Years in US	No.	
Fathers	China / Hong Kong / Taiwan	30	> 30	12	
	Mexico / Other Latin America	14	> 20 and ≤ 30	32	
	Australia / Canada / Great Britain / New Zealand	8	>10 and ≤ 20	11	
	Singapore / Phillipines / Vietnam	7	> 0 and ≤ 10	9	
	Korea / South Korea	6	0	14	
	India / Pakistan	6	Total =		78
	Nigeria / Zimbabwe	4			
	Bulgaria / Romania	2			
	Turkey	1			
	Total =	78			

	National Origin	No.	Years in US	No.
Mothers	China / Hong Kong / Taiwan	34	> 30	8
	Mexico / Other Latin America	16	> 20 and ≤ 30	33
	Korea / South Korea	7	>10 and ≤ 20	18
	India / Pakistan	6	> 0 and ≤ 10	11
	Denmark / Germany / Spain / Ukraine / Romania	6	0	13
	Canada / New Zealand / Great Britain	5	Total =	83
	Malaysia / Vietnam / Philippines	4		
	Zimbabwe / Nigeria	2		
	Turkey / Morocco	2		
	Unspecified	1		
	Total =	83		

Table 2: National origin and years in the US for participants' parents

Forty of the participants stated that their native language was something other than US English. The largest non-US English native language minority (14 of the 40) first spoke Mandarin (5), Cantonese (1) or unspecified Chinese (8). The next largest non-US English group reported that they spoke Spanish (8) as their first language. That group was followed in number by Korean (6). Of the 165 participants, 49 reported that the language they speak at home is something other than US English. Of those 49 participants, 24 speak a Chinese dialect: Mandarin (12), Mandarin mixed with English (2), unspecified Chinese (8), or Cantonese (2). Eight speak Spanish or a mixture of Spanish and English, and 7 identified the language they speak at home to be some other

variety of English (British English [2], Irish/British English [1], British and Canadian English [1], Canadian English [1], English [1], and Indian English and Hindi [1]). The distinction between US and the other Englishes was specifically requested in the demographics questions. The answer menu for those questions allowed participants to select between US English, ‘other English, such as British English’, or other. If either selection other than US English was chosen, then participants were required to fill in the specific language. A summary of native and home languages is set out in Table 3.

2.2 Anonymity and consent

Participants checked in by name at the registration desk in the waiting area of the testing site upon arrival. A number between 1000 and 1200 was randomly assigned to each participant. That number was used as the unique identifier for responses collected. To maintain anonymity of individual response sets, the participant number was never associated with the participant’s name or consent form. Participants were both assured both orally and in writing (on the consent form) that their participation was confidential and their responses were anonymous. Participants were also informed that the tasks would take an average time of 25 minutes in total to complete, but that they could withdraw consent and voluntarily end their participation at any time.

Participants' Language Background					
Native Language	No. of Ps	Years of English	No. of Ps	Language Spoken at Home	No. of Ps
Chinese / Mandarin / Cantonese	14	> 20	5	Chinese / Mandarin / Cantonese	20
Spanish	8	> 15 and ≤ 20	12	Spanish	7
Korean	6	> 10 and ≤ 15	9	Korean	5
English / British English / Canadian / Indian English	6	> 5 and ≤ 10	11	English / British English / Canadian / Indian English	4
Bengali / Ndebele / Punjabi / Romanian / Russian / Turkish	6	> 1 and ≤ 5	2	Bengali / Urdu / Turkish / Yoruba	4
		≤ 1	1	Mix of English plus other	5
				Mix of Cantonese and Vietnamese	1
Total =	40	Total =	40	Total =	49

Table 3: Participants' self-identified native language, years of English, and language spoken at home

2.3 Equipment and facilities

All testing was computer-based and took place on campus between October 20, 2009 and November 13, 2009 in the behavioral laboratory in the Jones School of Business at Rice University. The behavioral laboratory consists of a waiting/reception area and four sound-controlled testing rooms, as well as a hallway and several observation rooms. In order to minimize distractions and encourage concentration, each participant in this study was isolated in one of the four sound-controlled rooms during testing. Each room was equipped with a Windows™-based laptop computer with a built-in standard keyboard, a track pad, an external mouse, and a set of headphones (Sennheiser HD 201) connected to the computer's headphone port. All tasks were created using Inquisit™ software (Draine, 1998).

Participants were given general instructions about use and adjustment of the equipment for their comfort, including the chair, headphones, and mouse. The researcher started the testing software program before leaving the participant alone in the testing room with the door closed for the duration of the test. Participants were asked to return to the registration area when they were finished.

2.4 The Tasks

Because the order of administration of explicit and implicit tasks within the same testing session has been shown to have no effect on IAT results (Lane et al., 2007; Nosek et al., 2005), the three tasks were administered in the same order to each participant.

Between Tasks 1 and 2, a Rational Evaluation Inventory (Pacini & Epstein, 1999) (Pacini, R. & Epstein, S. 1999), which asked participants to self-assess the degree to which they emotionally or thoughtfully answer questions, was included as a distraction task. The REI is fully described in Section 2.4.3. A complete list of the REI questions is set out in Appendix B.

Upon completion of the tasks, participants were asked to supply demographic information about themselves. Details of the demographics questions are discussed in Section 2.4.4. A full list of demographics questions is set out in Appendix C. On average, it took participants approximately 25 minutes to complete the study (roughly 18 minutes for Tasks 1 and 2, two minutes for Task 3, and five minutes for the distraction task and demographics questions).

2.4.1 Task 1: Implicit Associations Test (IAT)

This study tested reactions to audio stimuli consisting of the recorded speech of two speakers reading a script in English, one with a native US-accent and the other with a native Korean accent. (A detailed discussion of these accent choices is set out in Section 2.4.2.1.1.) Task 1 consisted of an IAT that measured the participants' immediate associations in order to determine whether participants' implicit attitudes indicated a bias in favor of either speaker. According to the APE Model, individuals possess stereotypes and associates derived from their life experiences and beliefs. A given stimulus triggers an immediate associative response in the individual—devoid of propositional processing—based on spatiotemporal contiguity with, or feature similarity to, those pre-existing stereotypes or associates. These immediate responses, which can be measured by

implicit means (Gawronski & Bodenhausen, 2006), are the individual's affective reactions to the stimulus. By measuring reaction time in performance of a series of sorting tasks, the IAT determines which associations are easier for the participant to make based on the speed with which participants sort stimuli into target *concept categories* and *attribute categories*. Those associations that are easier for the participant to make are considered indicative of the participant's associative, affective response, revealing the stereotypes and associates the participant possesses, and, ultimately the participant's implicit attitude toward the attitude object. In this way, the IAT measures attitudes without requiring introspection on the part of the participant.

2.4.1.1 General IAT structure

Each IAT consists of a series of five computer-based testing steps or blocks, two of which (Blocks 1 and 2) are used to train the participant in the appropriate responses to a given set of stimuli. Visual stimuli, which can be either lexical or graphic, are presented on a computer screen. Auditory stimuli are cued through headphones.

Block 1: Learning the concept categories. The first training task requires the participant to correctly distinguish stimuli belonging to the two target concept categories. The participants respond to the stimuli by categorizing them as belonging to one of two concept sets by pressing one of two pre-determined response keys (e.g., 'E' or 'I') on the keyboard.

Block 2: Learning the attribute categories. The second training task requires the participant to correctly distinguish stimuli belonging to the two attribute categories (e.g., words representing positive versus negative valence) using the same keys as in Block 1.

In both Blocks 1 and 2, each stimulus is randomly presented twice (Perkins, Forehand, Greenwald & Maison, 2008).

The remaining three discrimination tasks are used to measure the speed with which the participant can categorize concepts and attributes that share a response key.

Block 3: Concept-attribute pairing #1. In this initial combined task, a target concept category and an attribute category are assigned to the same response key. Stimuli are selected alternately from each of the two-target concept and attribute categories. Selections of individual stimuli from the appropriate category are made randomly.

Block 4: Learning to switch the location of the concepts. The second and third combined tasks reverse the appropriate response (i.e., the response keys) for the target concepts. This allows participants to unlearn the previous category-response key associations, and it sets up the last discrimination task (Block 5), the reversed combined task.

Block 5: Concept-attribute pairing #2. This reversed combined task is the same as the initial combined task (Block 3), but with the target concept categories reversed. The response latency data from Blocks 3 and 5 is used to calculate the IAT score. The IAT measure is a function of the difference in average response speed between the initial combined task and the reversed combined task (Perkins et al., 2008).

2.4.1.2 Stimuli and target attribute and concept categories

The present study's IAT required participants to sort both audio stimuli (recorded audio clips) or visual lexical stimuli (attributes) into categories. The use of audio tokens was deemed essential to this linguistic study of reactions to accent. Audio stimuli have

been used in only one previous IAT study (Vande Kamp, 2002). That study measured immediate responses to insect versus bird noises, synthesized male versus female voices, and African American versus European American voices. The voice tokens for gender difference analysis were generated by a synthesized vocal simulator. The voice tokens for the race analysis were taken from voice archives of human voices. These tested reactions to the production of the phrase ‘Hi, how ya doin’?’.

The audio stimuli in the present study’s IAT consisted of eight short segments (lexical items and phrases) excerpted from the full-length audio recordings used in Task 2, specifically: *at 2:25; two options; assistance first; training and experience; it is my opinion; I have frequently encountered; perform charting; probability*. These stimuli were pre-tested for neutrality of semantic valence to ensure that the average participant would not react strongly to the substance of the stimulus. The pre-test was conducted in an on-line survey in which participants rated the semantic valence of 20 possible stimuli on three dimensions (bad-good, unpleasant-pleasant, and negative-positive) on a seven-point scale, with a score of 7.00 indicating the extreme of positive semantic valence, a score of 1.00 indicating the extreme of negative semantic valence, and 4.00 indicating neutral semantic valence. As reflected in Table 4, below, the stimuli scripts indicated neutral semantic valence within a variance of 0.5.

The excerpts were equalized for loudness using SoundForge™ and trimmed of silent lead time at the start of each clip. In each audio clip, the lexical items or phrases were repeated three times with one second of silence between each instance. It was expected, however, that reactions to the audio clip would occur immediately, and that categorization would, therefore, occur before completion of the first iteration of the

stimulus token. The order of presentation of the audio clips was randomized over the participant pool.

Semantic Valence of Audio Stimuli				
Audio excerpt	Valence (4.00 = Neutral; 1.00 [-] to 7.00 [+])			
	Bad/ Good	Un- pleasant/ Pleasant	Negative / Positive	Average
<i>at 2:25</i>	4.08	4.00	4.00	4.03
<i>two options</i>	3.92	4.17	4.00	4.03
<i>training and experience</i>	5.17	4.17	4.92	4.75
<i>assistance first</i>	4.42	4.00	4.42	4.28
<i>I have frequently encountered</i>	4.00	3.83	4.25	4.03
<i>perform charting</i>	3.58	3.42	3.75	3.58
<i>probability</i>	4.17	4.08	4.08	4.11
<i>it is my opinion</i>	3.92	3.83	4.17	3.97

Table 4: Results of pre-test for semantic valence of audio stimuli

In addition to the audio stimuli, the IAT requires participants to sort visual stimuli, in this case lexical tokens. In this study, the visual lexical stimuli consisted of attributes that were chosen as emblematic of either obviously positive or obviously negative concepts. The positive attributes selected were: *marvelous, superb, pleasure, beautiful, joyful, glorious, lovely, and wonderful*. The negative attributes selected were: *tragic, horrible, agony, painful, terrible, awful, humiliate, and nasty*. These specific attributes are a combination 2 to 4 syllable nouns, verbs, and adjectives that are identifiable as representing only one of the four categories presented. Because latency is

the basis for the IAT score, stimuli that take longer to identify or that could be identified as belonging to either the attribute or concept category might introduce an unwanted confound into the study (Nosek et al., 2007; Ottaway, Hayden & Oakes, 2001; Schnabel, Asendorpf & Greenwald, 2008; Steffens, Kirschbaum & Glados, 2008). In the present study, for example, use of a foreign word like *Nazi* would undermine the validity of the IAT because it could be categorized as either *Foreign* or *Bad*. The presentation of attributes was randomized across participants.

In the course of the IAT, participants were asked to sort these audio stimuli and visual stimuli into categories. Specifically, participants were asked to sort the visual lexical stimuli into two target *attribute categories*, designated as *Good* and *Bad*. Participants sorted the audio stimuli into target *concept categories*, designated as *Foreign* and *American*.

The attribute category labels, *Good* and *Bad*, are well established in the IAT literature as generally indicating the opposite poles of semantic valence (e.g., Greenwald, McGhee & Schwartz, 1998). The concept category labels, which had not been used in previous research, were selected as the least problematic of several options. While America technically encompasses all of North, Central and South America, *American* in common parlance can also be the adjective form for *of or from the United States of America*, or the noun for *a person who is from the United States of America*. Of course, *Foreign* has a relative, and therefore ambiguous meaning. In this context, however, when juxtaposed with *American*, it clearly indicates *non-American*. Furthermore, although negatively-formed compounds (i.e., a noun or an adjective prefixed by *un-*, *not*, or *non-*) have been used as a category label in other studies, such as *Me* and *Not Me* (Gemar,

Segal, Sagrati & Kennedy, 2001), it was determined that *non-American* and *Not American* were not good choices for the present study.²⁰ To maintain internal validity, it is vital that category labels be quickly distinguishable. Because *American* is a relatively long, four-syllable word, it was determined that the addition of a negation before the word would not be as distinguishable as an entirely different word. Furthermore, the juxtaposed category labels *American* and *Foreign* had been tested in previous research (Nosek et al., 2005), where they were proven successful. As a result, *Foreign* was the selected as the most appropriate choice.

To facilitate the distinction between attributes and concepts, attributes and attribute category labels appeared on the computer screen in a green font, and concept category labels appeared in white.

2.4.1.3 IAT Procedure

Participants were instructed to place their index or middle fingers on the ‘E’ and ‘I’ keys of the computer keyboard. For each testing block of the IAT, target categories appeared in fixed position in the upper right and upper left corners of the computer screen. As stimuli were presented, participants sorted the stimuli as belonging to the target category on the left of the screen by pressing ‘E’ and as belonging to the target category on the right of the screen by pressing ‘I’. Participants were instructed to work as quickly as possible in categorizing stimuli without making a mistake. Incorrect categorizations were indicated by the appearance of a red ‘X’ in the center of the screen

²⁰ Of course, *un-American* is inappropriate because it can connote hostility towards America or Americans, as does *anti-American*.

for 400 milliseconds. Participants were required to correct the categorization of the stimulus by pressing the correct key before proceeding with the test. Image 1 is a capture of the first screen presented to participants in the concept category sorting task.

Consistent with general IAT procedure, blocks 1, 2 and 4 were training blocks. The purpose of these blocks was to prepare participants for the measurement blocks. Consequently, participants' performance in these blocks was measured, but was not included in the IAT results calculations. In Block 1, the 16 attribute stimuli appeared individually in the center of the screen. Participants categorized each attribute as either *Good* or *Bad*. In Block 2, the eight audio stimuli were presented twice individually to participants (for a total of 16 stimuli), who categorized each stimulus as either *Foreign* or *American*. Block 4 repeated Block 2, but with the reverse location of the target concept category labels on the computer screen and a different randomized order of presentation of the audio stimuli. (That is, if *Foreign* appeared in the upper left corner and *American* appeared in the upper right corner of the computer screen in Block 2, *Foreign* appeared in the upper right corner and *American* appeared in the upper left corner of the computer screen in Block 4.) The assignment of initial screen position to target category labels (*Good/Bad* and *Foreign/American*) was counterbalanced for the participant pool, so that half the participants saw positive words on the left and negative on the right, and half saw them reversed. A sample screen capture of the first testing screen presented to participants in Block 1 is set out in Image 2, below.

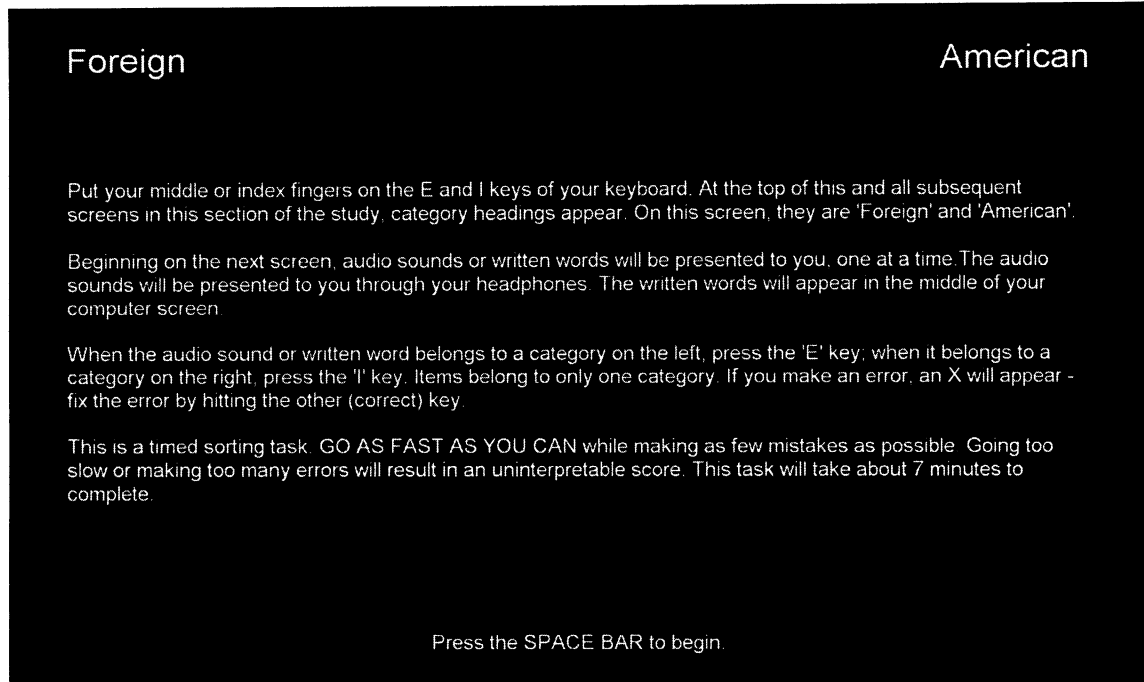


Image 1: A screen capture of the instructions for the concept category sorting task

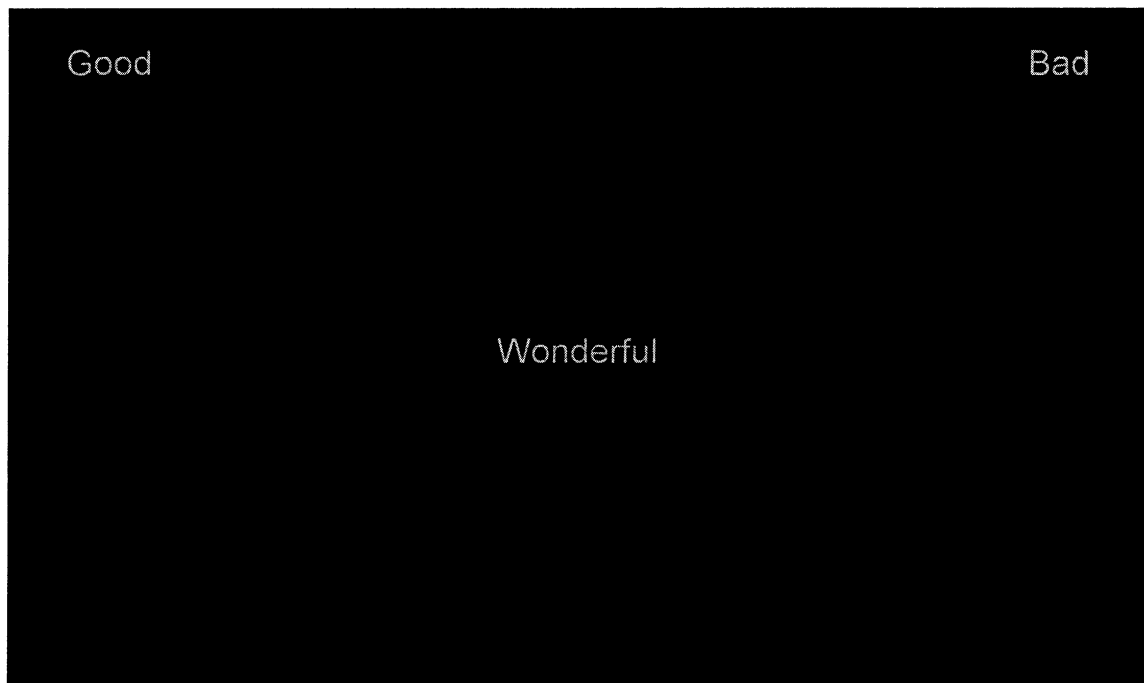


Image 2: A screen capture of the first testing screen in Block 1

Blocks 3 and 5 were measurement blocks. These blocks differed in appearance from the training blocks by presenting participants with paired attribute and concept categories in the upper left and right corners of each screen. An example of the instructions screen for the measurement blocks is shown in Image 3, and the first screen in the measurement blocks is shown in Image 4, below. Accordingly, in one block, *Foreign* and *Good* were paired on one side of the screen and *American* and *Bad* on the other, and in the other block, *Foreign* and *Bad* and *American* and *Good* were paired. The assignment in Block 3 of initial screen position to target category labels was counterbalanced for the participant pool. In these blocks, each of the eight audio stimuli was presented twice and each of the 16 lexical stimuli was presented once, for a total of 32 stimuli. In Blocks 3 and 5, then, the IAT measured whether it is easier for participants to conceptualize categories that connect *Foreign* and *Good* on the one hand, and *American* and *Bad* on the other, or vice versa.

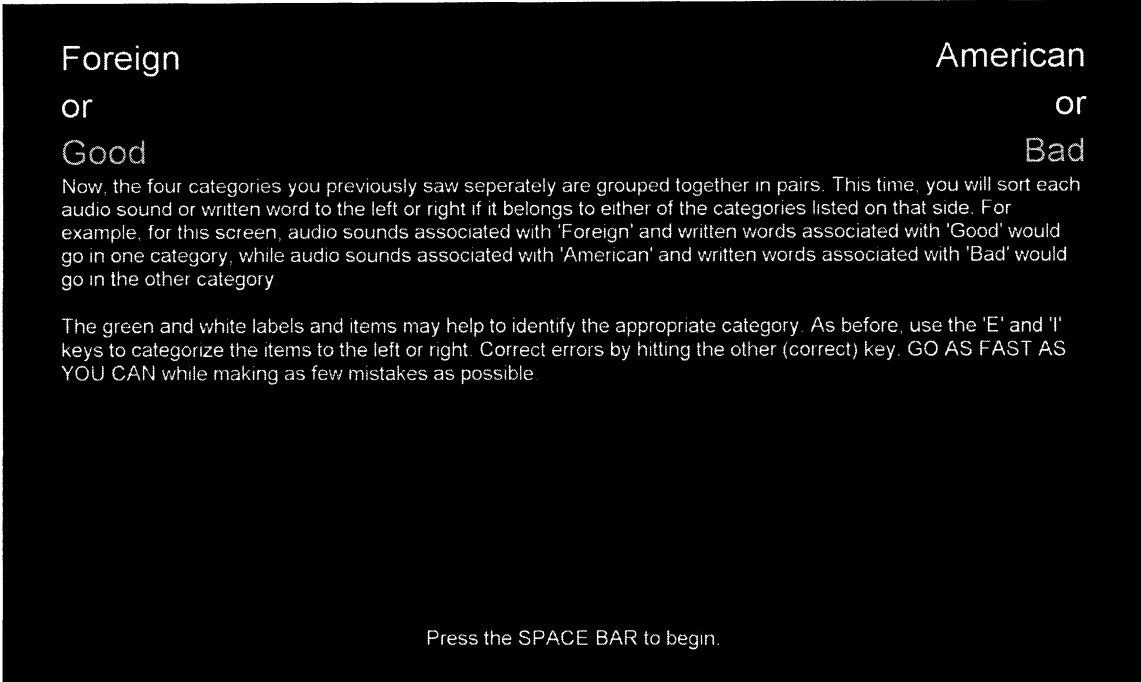


Image 3: A screen capture of the instructions screen in the measurement block

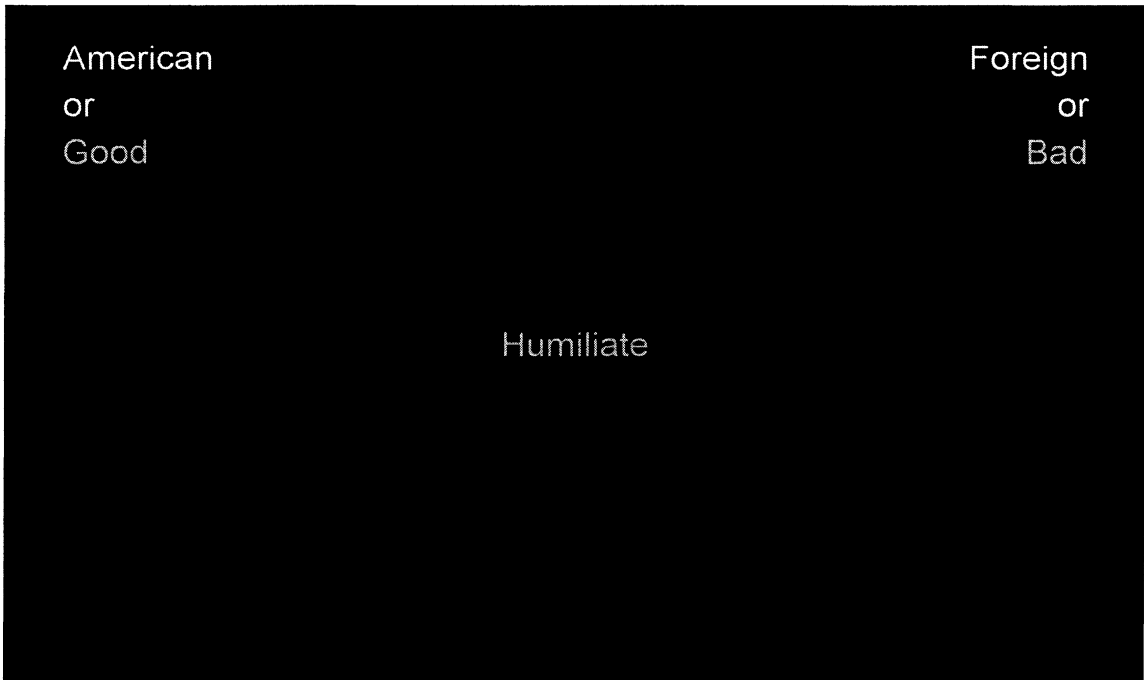


Image 4: A screen capture of a testing screen in the measurement block

Table 5 sets forth the IAT structure by testing block. The stimuli, attribute category labels, and concept category labels are listed for each block. Within each testing block, audio stimuli were presented twice to participants, while visual stimuli were presented once. The initial screen position of the category labels was counterbalanced across participants. Stimulus presentation order was randomized across participants.

Summary of IAT Testing Blocks			
	Upper Left	Stimulus	Upper Right
Block 1 Training	Good	marvelous, superb, pleasure, beautiful, joyful, glorious, lovely, wonderful tragic, horrible, agony, painful, terrible, awful, humiliate, nasty	Bad
Block 2 Training	Foreign	<i>at 2:25; 2 options; assistance first; training and experience; it is my opinion; I have frequently encountered; perform charting; probability</i>	American
Block 3 Measurement	Foreign Good	<i>at 2:25; 2 options; assistance first; training and experience; it is my opinion; I have frequently encountered; perform charting; probability</i> marvelous, superb, pleasure, beautiful, joyful, glorious, lovely, wonderful tragic, horrible, agony, painful, terrible, awful, humiliate, nasty	American Bad
Block 4 Training	American	<i>at 2:25; 2 options; assistance first; training and experience; it is my opinion; I have frequently encountered; perform charting; probability</i>	Foreign
Block 5 Measurement	American Good	<i>at 2:25; 2 options; assistance first; training and experience; it is my opinion; I have frequently encountered; perform charting; probability</i> marvelous, superb, pleasure, beautiful, joyful, glorious, lovely, wonderful, tragic, horrible, agony, painful, terrible, awful, humiliate, nasty	Foreign Bad

Table 5: The IAT blocks. Audio stimuli are in italics; visual stimuli are in plain text.

2.4.1.4 Measurement

The latency for each participant in sorting stimuli is measured in milliseconds and recorded as the response data. That data is used to calculate the IAT score. The IAT score is calculated generally as the difference between central tendency measures obtained from the two measurement blocks (Blocks 3 and 5) across participants. The specific method of scoring is somewhat similar to Cohen's *d*-measure of effect size, in that the mean latency scores for Blocks 3 and 5 are calculated, and the difference between the two means is divided by the standard deviation of all the latencies in the two test blocks. This method of IAT scoring is referred to as the *D*-measure (Greenwald, Nosek & Banaji, 2003). The *D*-measure differs from the standard Cohen's *d*-measure in the calculation of the denominator's standard deviation. Instead of using the *d*-measure's pooled within-treatment standard deviation, the *D*-measure uses a standard deviation calculated only from the scores in Blocks 3 and 5. In previous studies, the *D*-measure proved superior to the *d*-measure based 'on five performance criteria: (a) magnitude of implicit-explicit correlation, (b) resistance to contamination by response speed differences, (c) resistance to IAT-score-reducing effect of prior experience with the IAT, (d) sensitivity to known effects on IAT measures, and (e) latent implicit-explicit path in CFAs [confirmatory factor analyses]' (Greenwald et al., 2003).

2.4.2. Distraction task

Between Task 1 and Task 2, participants completed a Rational Experiential Inventory (REI; Pacini & Epstein, 1999). The REI consisted of the following 40

questions asking participants to evaluate the manner in which they believe they make decisions. Evaluations were made of statements like ‘I try to avoid situations that require thinking in depth about something’ on a scale of one to five (1 = Definitely NOT true of myself, 5 = Definitely true of myself). Image 5 is a screen capture of the first screen in the REI section. A complete list of the REI questions is set out in Appendix B. The purpose of the REI was twofold: first, it served as a distraction task between the implicit and explicit measures; and, second, it provided a means of identifying any participants whose testing results would be anomalous and should be disregarded.

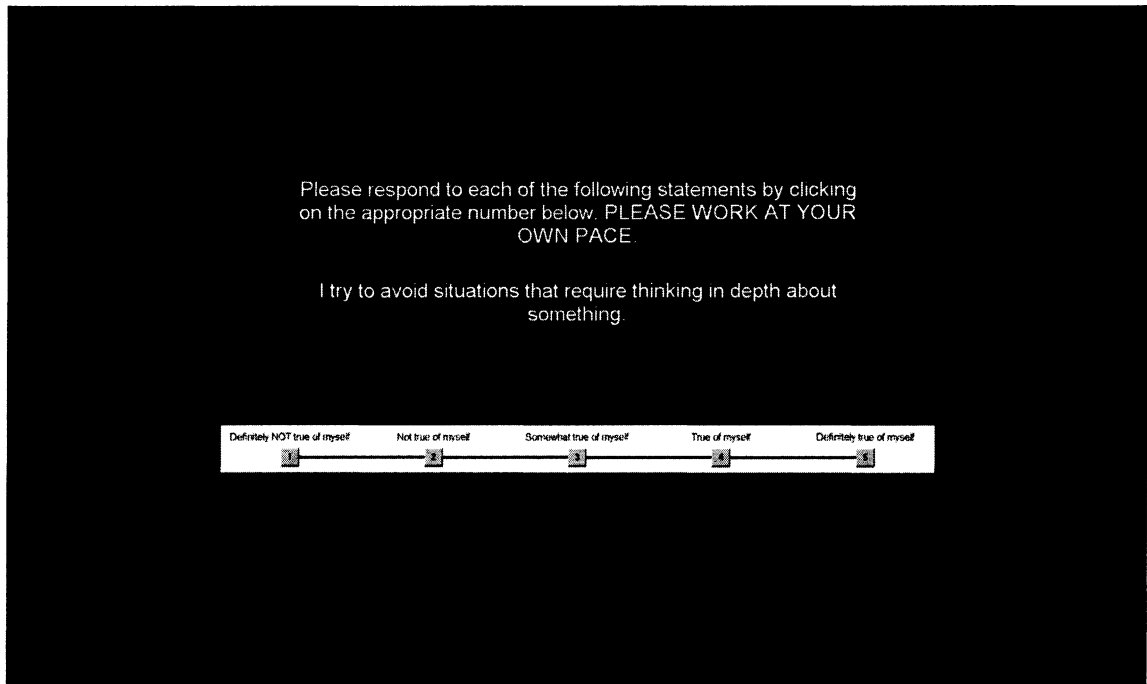


Image 5: A screen capture of the first screen in the REI distraction task

2.4.3 Tasks 2 and 3: Self Reports

In contrast to Task 1, which measured participants’ implicit attitudes, Tasks 2 and 3 were designed to measure participants’ explicit attitudes toward foreign accented

speech. Under the APE Model (Gawronski & Bodenhausen, 2006), explicit attitudes are formed through propositional processing. In the course of propositional processing, which is concerned with maintaining consistency among propositions, individuals determine the truth value of propositions considered, including the validity of implicit attitudes formed through associative processing. In propositional processing, implicit attitudes are converted into questions of consistency with respect to other propositions held by the individual. If, for example, an individual possesses a negative implicit attitude towards people of a certain race, that implicit attitude is reviewed in the course of propositional processing in light of other propositions the individual holds, like the knowledge that racism is considered a social evil. In propositional review, the individual would weigh the views of society against the initial personal negative reaction, and potentially revise his or her explicit attitude towards the attitude object. It is important to note, however, that, despite this propositional process that creates an explicit attitude, under the APE Model, the initial negative implicit attitude is not necessarily revised. Instead, the implicit attitude remains intact and accessible at any time. While implicit attitudes can be revised, they are resistant to change because they are based on connections made to entrenched existing associates and stereotypes. Furthermore, even if they are revised, implicit attitudes remain a separate attitude construct. Consequently, individuals simultaneously possess both implicit and explicit attitudes towards the same attitude object, and those attitudes can diverge.

Given this potential for divergent implicit and explicit attitudes, the purpose of Tasks 2 and 3 was to measure participants' explicit attitudes toward the same speech that was the subject of the implicit measures in Task 1. In this study, explicit attitudes were

measured in Tasks 2 and 3 by self-report, a methodology that necessarily requires introspection on the part of the participant. Specifically, participants listened to audio recordings of US-accented and foreign-accented speech, and responded to questions about the speakers and speech they heard. The audio recordings presented the fictional audio testimony of two male actors portraying physicians in a medical malpractice trial. One actor portrayed the treating physician, and the other portrayed a hired expert witness who disputes the manner in which the treating physician acted in the course delivering a baby. Both testimonies were presented in English. One of the actors is a native Korean speaker and the other a native US-English speaker. The task was counterbalanced for accent and presentation order across participants.

In Task 2, participants evaluated the speakers and speech in two ways: on the basis of individual speaker traits, and by the more general selection of their preferred speaker. In Task 3, participants evaluated the fairness of hypothetical trial outcomes. The specifics of each of the tasks is discussed, respectively, in Section 2.4.2.2.

2.4.3.1 Materials

Because this study is focused on language attitudes and perception, and a number of previous studies have established that a variety of language-unrelated personal features such as physical appearance and presentation characteristics affect jurors' perceptions (Catano, 1980; DeSantis & Kayson, 1997; Lavrakas & Bickman, 1975; Wells & Bradfield, 1998; Yarmey & Kent, 1980),²¹ this study presented audio-only stimuli.²²

²¹ Additionally, Frumkin engaged actors to mimic both appearance and accents of their non-native language. This performance may have appeared inauthentic and due to the lack of disclosure of actor-status – deceptive.

Two actors were selected on the basis of their similar age and differing native accents. Studies examining the effect of accent (e.g., Frumkin, 2007; Sobral Fernández & Prieto Ederra, 1994) traditionally have employed a matched-guise approach (Lambert, 1967). That approach requires one actor to switch accents to read both parts. Because the present study tested a number of dependent variables that included believability and credibility, the risk that the perception of an affected accent would introduce an unwanted confound into the study and influence credulity judgments was deemed too high to use the matched-guise approach (Reich, 1981). Consequently, two actors using their natural, native accents were used instead. To assure minimal differences between the recordings, the verbal performances of the actors were analyzed acoustically for pitch variation and fundamental frequency differences. Both of these factors have been shown to affect perceptions of pleasantness (Eadie & Doyle, 2005; Fridland & Bartlett, 2006) and, at least potentially, other variables in the solidarity dimension, such as likeability. In the recording of the first script, the US-accented actor's pitch range fluctuated between a minimum of 88 Hz to a maximum of 482 Hz, and the Korean-accented actor's pitch range fluctuated between 90 Hz and 457 Hz. In the recording of the second script, the US-accented actor's pitch range fluctuated between a minimum of 87 Hz and 479 Hz, and the Korean-accented actor fluctuated between a minimum of 88 Hz and 397 Hz. The differences between the fundamental frequencies of the two speakers was found to be insignificant ($p < .01$).

²² While it is true that jurors in a real trial observing live or videotaped witnesses react to many factors, including visual factors, when assessing a witness, the present study does not purport to recreate a courtroom setting. Instead, this study was designed to determine the effect of one independent variable—foreign accent—on the various dependent variables tested.

2.4.3.1.1 Accent selection. The present study focuses on listener perceptions of US- and foreign-accented English, and not on the status of any specified or identifiable foreign or regional accent. Numerous previous studies have established that information about the nationality of a speaker with a foreign accent impacts perceptions of the speaker; the prestige accorded a foreign accent is indicative of the prestige accorded to the country of the accent's origin (e.g., Brennan & Brennan, 1981a; Brennan & Brennan, 1981b; Cargile & Giles, 1997; Gudykunst & Ting-Toomey, 1990; Lippi-Green, 1994; Lippi-Green, 1997; Ryan, 1982). Accordingly, participants were not provided with any information about the origin of the expert witnesses.

Furthermore, the accents were selected because they defy ready identification. Several studies have shown that unidentified foreign accents do not create the same negative preconceptions about competence, intelligence, education and likeability as low prestige, easily recognized accents (Frumkin, 2007; Lindemann, 2003). Because it is seldom (approximately eight percent of the time) correctly identified in the US (Lindemann, 2003), Korean was selected as an appropriate foreign accent for the present study²³.

The US-accented speaker selected was from the Philadelphia area. The mid-Atlantic accent was selected because of it is seldom recognized outside the mid-Atlantic region, and even when it is, it enjoys neutral prestige (Frumkin, 2000; Frumkin, 2007).

²³ Participants were not asked to rate the Korean speaker's degree of accentedness in the present study. Previous research has shown that, when comparing US-accented speech to foreign-accented speech, the negative affective consequences attendant to the foreign accent do not necessarily vary with the degree of accentedness or level of intelligibility of the speech (Cargile & Giles, 1997).

Specifically avoided were widely recognizable and often stereotyped accents typical of speakers from New York, Southern California, and the upper plains states, as well as speakers who participate in the Northern Cities or Southern Shifts.

2.4.3.1.2 Legal context. As discussed above, previous courtroom-based studies have considered eyewitness testimony in fictional criminal trial contexts (Frumkin, 2007; Sobral Fernández & Prieto Ederra, 1994). Here, the trial context is a civil medical malpractice trial, and the testimony is expert testimony. Malpractice trials hinge on the testimony of expert witnesses, who testify as to the standard of care exercised in the treatment of the patient: the treating physician maintains he or she acted as any reasonable doctor of similar training and experience would; the plaintiff's expert testifies that the treating physician did not reasonably. The pretext for contradictory testimony is thus naturally plausible. Additionally, because both experts are doctors, a potential confound for authority could be eliminated by portraying them as equally qualified and accredited.²⁴ Furthermore, malpractice trials are based almost entirely on the expert witnesses' testimonies. Judges instruct jurors to restrict their determination of the proper standard of care to the expert witnesses' testimonies, and to disregard anything they think they know or may have heard outside the courtroom. Because the average juror is not a

²⁴ Although previous research indicated that authority was not determinative of eyewitness believability in criminal trials, the context in the present research is significantly different. The credibility of an eyewitness is not logically associated with social position. However, the believability of an expert witness who is contradicting the professional judgment of another witness logically could be connected to the relative authority (including schooling, experience, professional affiliations, and the like) of the witnesses. To eliminate this potential confound, the present study's witnesses are both physicians with similar qualifications.

physician, jurors must rely on the physician expert witnesses to explain the standard of care that is reasonable under the fact situation presented and whether the treating physician met that standard of care.²⁵ Finally, although other technical fields might also lend themselves to expert testimony, the subject matter of a medical malpractice trial is at least potentially more interesting than most.

2.4.3.1.3 The scripts. The same testimony scripts that were used in the 2008 Study were used in the present study. The scripts were controlled to neutralize potential differences. The language in the scripts was equalized for number of technical terms and approximately matched in length²⁶. In addition, the texts were analyzed using the Linguistic Inquiry Word Count software (Newman, Pennebaker, Berry & Richards, 2003), which has been successfully used in credibility assessments. No significant differences were found between the texts concerning language vividness, displacement or other factors potentially relevant to perceptions of believability.

²⁵ It is important to note also that the present study does not involve a criminal trial dependent upon the testimony of eyewitnesses. Criminal attorneys cannot select who witnesses a crime. In contrast, trial attorneys in medical malpractice lawsuits select and hire their expert witnesses. Consequently, information about factors that contribute to witness believability is of more practical benefit to civil trial attorneys who rely on expert testimony. Civil trial attorneys might consider the effects of foreign-accented speech not only in hiring decisions, but also—and perhaps more importantly—in deciding what issues to address with potential jurors during the jury selection process. By making potential jurors consciously aware of a potential bias against foreign accented speech, it is hoped that its effects on the receptiveness to the expert’s testimony can be minimized.

²⁶ The treating physicians testimony was 337 words and the expert witness testimony was 318 words long.

A practicing medical malpractice attorney wrote both scripts; they are based on deposition testimony taken from an actual medical malpractice lawsuit.²⁷ The scripts deliberately represent two equally plausible opinions regarding the treatment of the patient in the fact situation presented.²⁸ In their testimony, the physicians provide contradictory opinions regarding the reasonableness of the care taken in the treatment of a woman during the delivery of her child. The treating physician details his course of treatment and explains the rationale for his approach. The expert witness criticizes the treating physician's assessment of the patient's condition and the ensuing treatment, which the expert characterizes as negligent. To minimize the potential for a sympathetic reaction based on the facts of the case, neither the extent of the child's injuries nor the condition of the child at the time of trial was revealed to participants. The complete texts of the physicians' scripts are set out in Appendix A.

2.4.3.1.4 The recordings. Each actor was individually recorded with an Edirol™ flash recorder (model R-09) using unidirectional lapel microphones in a sound-controlled booth. The sound files were saved in .wav format and were normalized to relative loudness using audio editing software (Audacity™) before being finalized. One final .mp3 sound file was created for each actor for each script.

²⁷ The names and certain identifiable facts were altered to maintain the anonymity of the parties.

²⁸ The fictional testimony is based on statements made by physicians in depositions taken during the pretrial discovery phase of an actual medical malpractice case. The facts and name of the doctor mentioned (only one doctor's name is stated in the fictional testimony) were changed to obscure any connection to the actual case.

2.4.3.2 Explicit Measures Procedure

Participants listened to the recorded, fictional audio testimony of two male actors portraying physicians in the context of a hypothetical medical malpractice lawsuit. One of the actors speaks English with a Korean accent and the other with a native US accent. The physicians are presented as equally well-qualified practicing physicians. No other information about the physicians was conveyed to the participants.

Presentation of accent was counterbalanced to allow for analysis of both accent and presentation order, to test for a bias for order irrespective of accent. In all versions, the treating physician testifies first, followed by the expert witness.

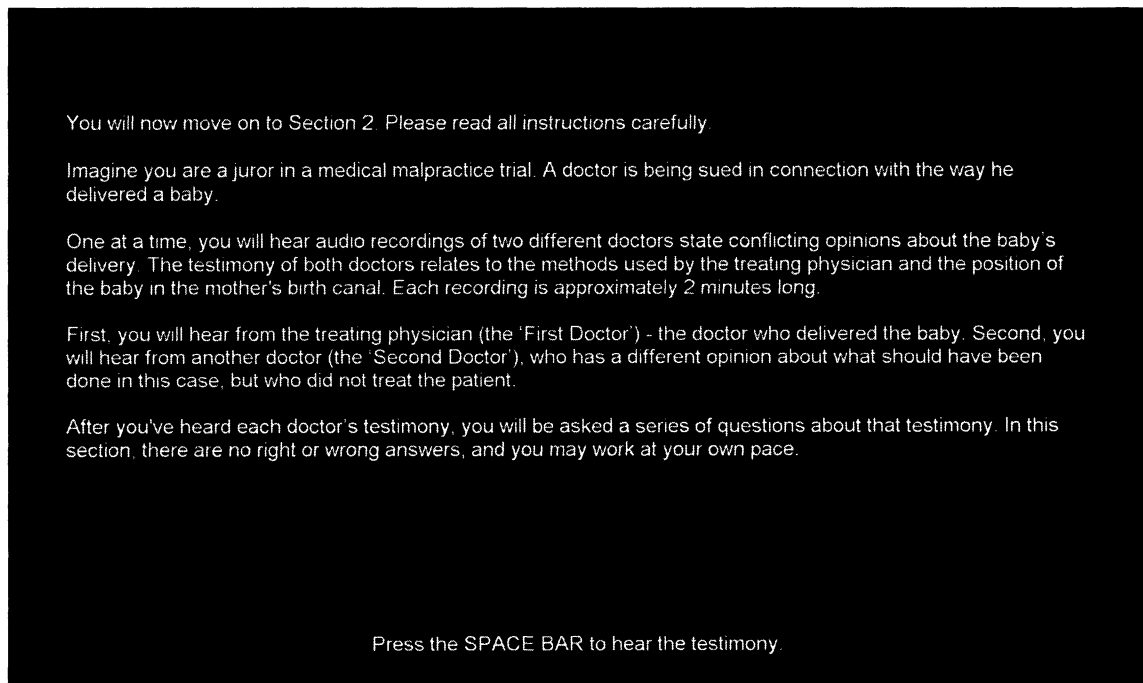


Image 6: A screen capture of the instructions at the start of the explicit measures section (Task 2)

The instructions to the participants (as illustrated in Image 6) included a description of the study format, and specifically that they would be asked to listen to each testimony. After each physician's testimony, they would be asked to answer a series of questions about the testimony they just heard. Participants were informed about the general topic of the case. Participants were also told that there were no right or wrong answers in this section and that they could work at their own pace.

After hearing the first doctor's testimony, participants were asked to rate the physician and his testimony for the 14 variables listed below. These traits were selected as representative of traits tested in the language attitudes literature that represent both the solidarity and status dimensions (e.g., Yzerbyt, 2005).

- (a) believability
- (b) credibility
- (c) trustworthiness
- (d) knowledge
- (e) expertise
- (f) intelligence
- (g) competence
- (h) likeability
- (i) friendliness
- (j) warmth
- (k) judgment
- (l) persuasiveness
- (m) presentation style
- (n) clarity

The order of the presentation of these variables was randomized across participants. An example of one of the screens asking participants to rate one of the traits is set out in Image 7. The variables were rated on a scale from 1 to 11 (Very Low to Very High). This scalar analysis allowed for a complete, fine-grained analysis of the variable effects.

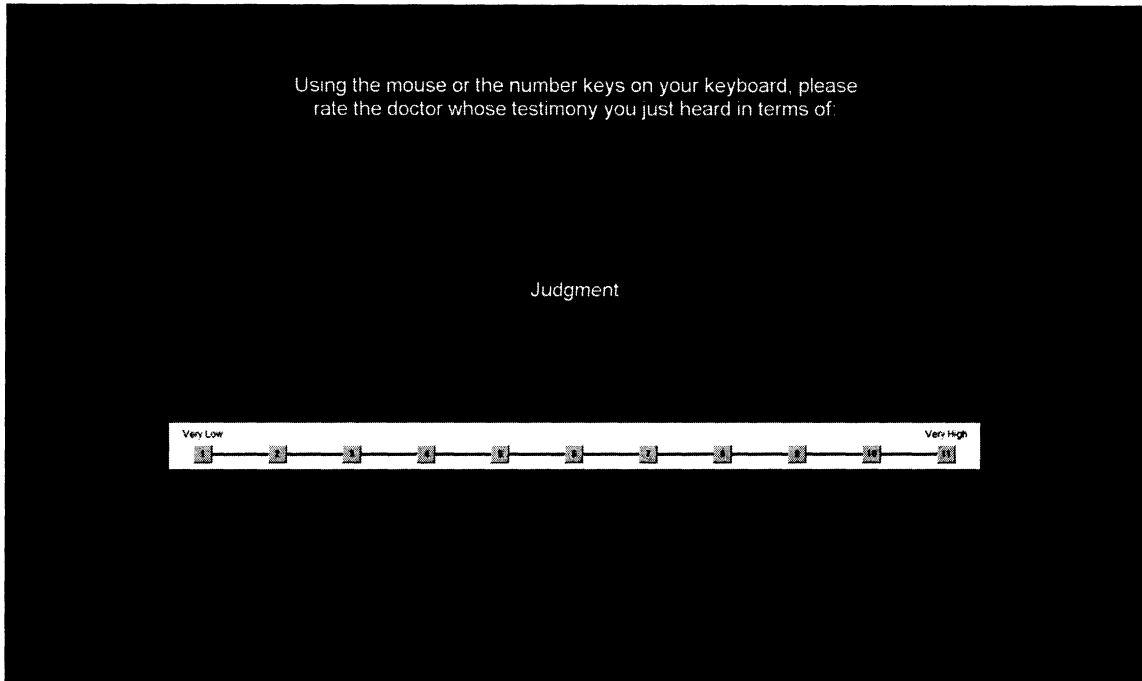


Image 7: A screen capture of an explicit measure of one of the trait measures

As illustrated in Image 8, after hearing the first doctor's testimony and rating the doctor in terms of the 14 dependent variables, participants were told they would hear from the doctor testifying for the other side in the dispute.

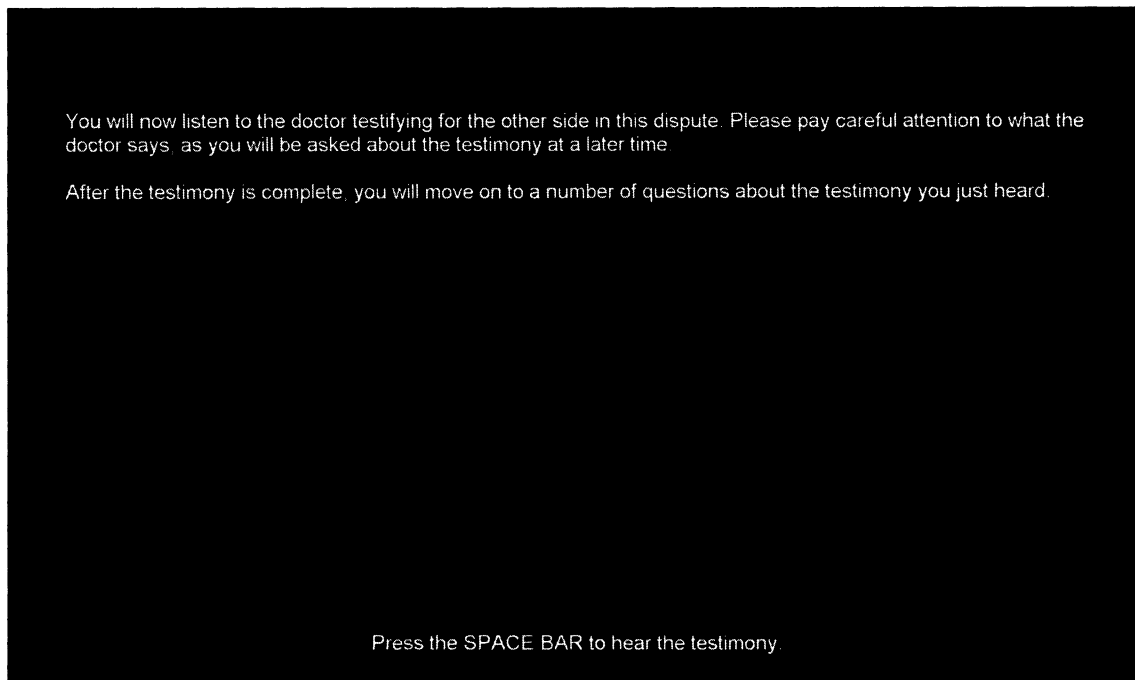


Image 8: A screen capture of the instructions between doctors' testimonies

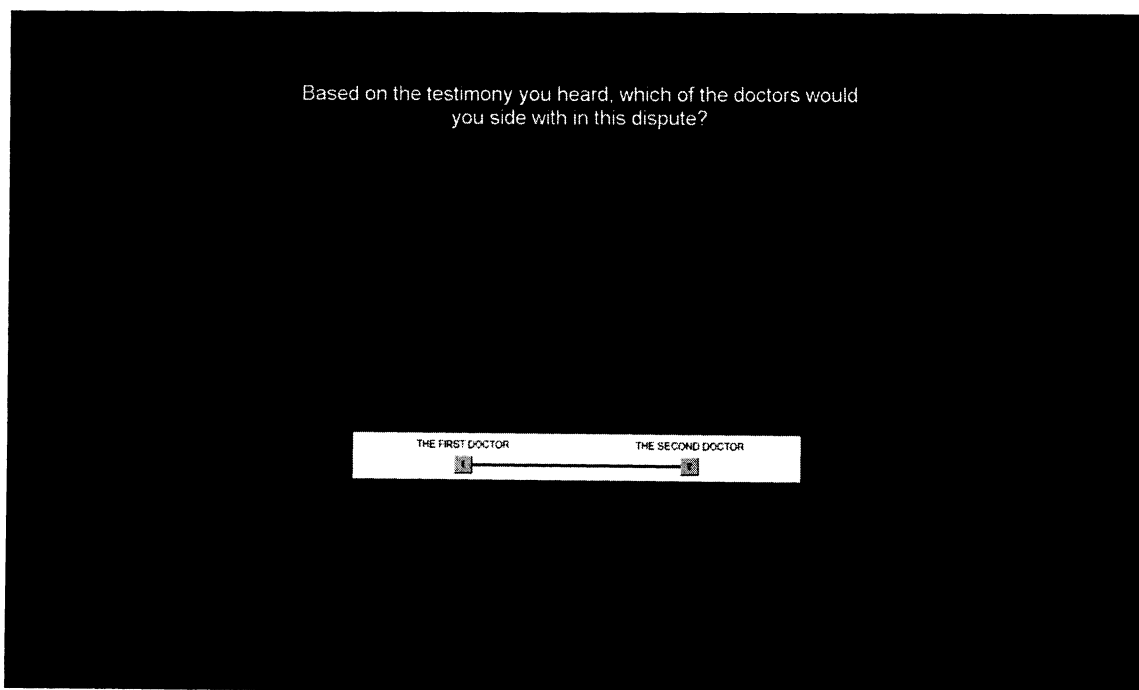


Image 9: A screen capture of the binary doctor preference question

In addition to the questions presented after hearing each physician testify, after hearing both physicians' testimonies participants were asked to rate the testimonies relative to each other in two different ways. First, participants were asked to make a binary choice between the physicians by indicating which of the two they would side with in the dispute (see Image 9).

Next, participants were asked to state the extent to which they sided with one physician over the other (see Image 10).

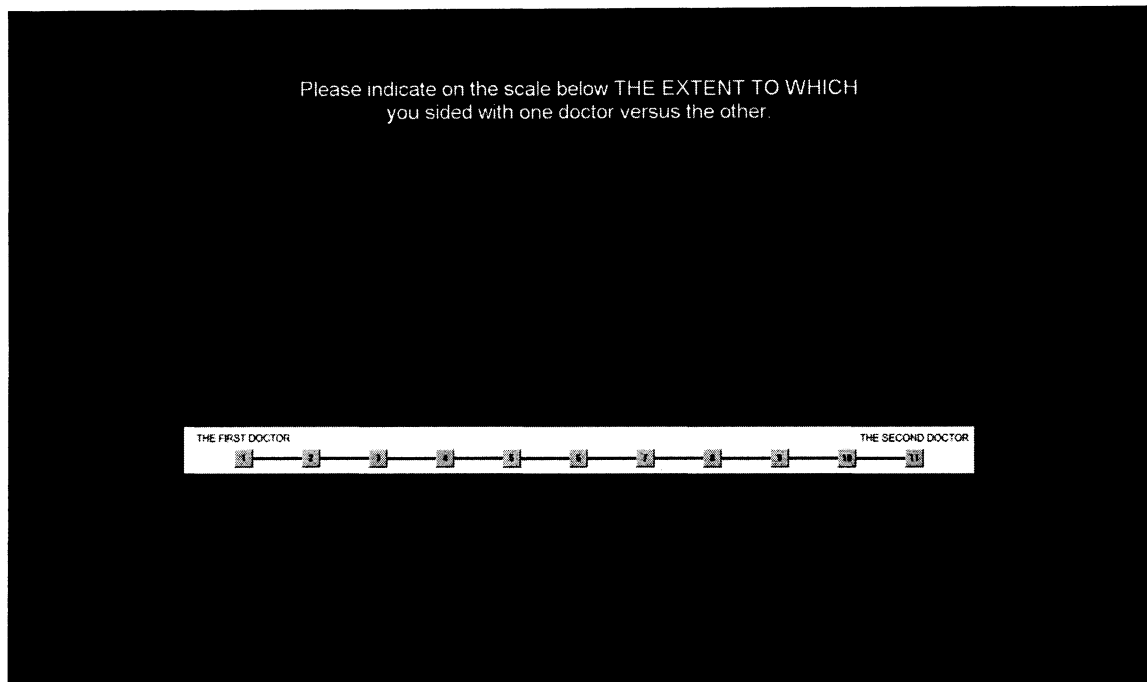


Image 10: A screen capture of the slider doctor preference question

2.4.3.3 Speaker nationality

In addition to the foregoing questions, after hearing each recorded testimony participants were asked to state the nationality of the speaker they just heard. The purpose of the question was to gauge the accuracy of listener perceptions of nationality.

2.4.4 Task 3: Self-Report for Fairness

Task 3 consists of a second self-report that measures participants' reactions to a written statement regarding the outcome of the case, with the purpose of checking participants' reactions in Tasks 1 and 2. Captures of the screens constituting this task are set out in Images 11 and 12.

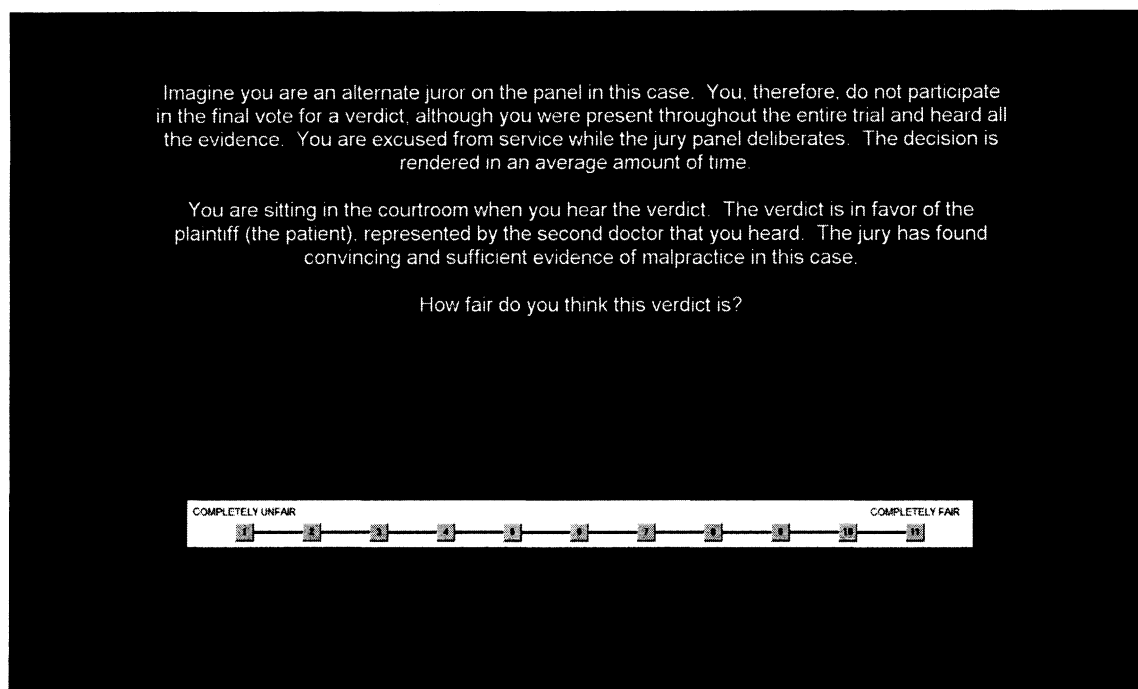


Image 11: A screen capture of one of the confirmation questions (verdict for the defendant) (Task 3)

Because the APE Model assumes that the associative and propositional processes can inform each other constantly, it is helpful to confirm earlier findings. For this task, If a participant is told that the US-accented witness is the defendant (i.e., the treating physician), then it is expected that a statement that the defendant won would be rated as ‘fair’, and a statement that the plaintiff won, as ‘unfair’, if affective reactions find a pro-US accent bias. Likewise, the complement should also be found.

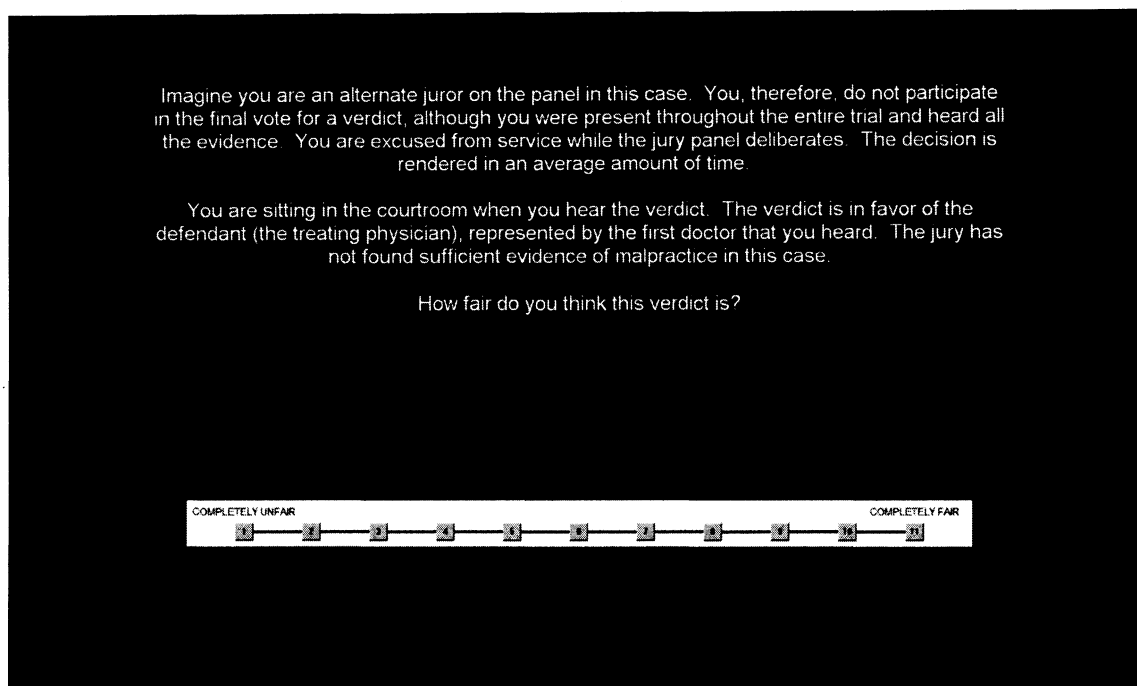


Image 12: A screen capture of one of the confirmation questions (verdict for the plaintiff) (Task 3)

2.4.5 Demographics questions

The final task required participants to answer 14 questions about their personal background, including questions about the participants' sex, age, race, ethnic identity, and nationality, as well as their mother's race and their father's race. The demographics survey also included questions about the participant's native language and the language spoken by the participant at home, as well as questions about the participant's educational background and postal code. Sample screens are set out in Images 2.13 through 2.16. A complete list of demographics questions, along with representative screen captures, is included as Appendix B.

Finite-answer questions, like gender, age range, and educational background were structured as simple pull-down menu selections. Race, ethnicity and language questions were structured in two parts. The first part offered drop-down menu selections for various races (White [Non-Hispanic], African-American, Asian, Hispanic, Native American, Mixed Race, Other). If a category besides 'other' was selected, the participant proceeded to the next question. If the participant selected 'other', he or she was taken to another screen that asked them to supply the specific information. Zip code questions were free-answer boxes. Questions about how strongly the participant self-identified as their stated race and nationality were structured as pull-down menu selections, where the choices ranged from 1=not strongly to 11=very strongly.

2.5 Post-test debriefing

Participants returned to the waiting area after completing the test. In the waiting area, participants were asked individually and privately whether they had encountered any problems with the software or equipment. They were then asked whether they had any questions about the study. They were told verbally about the purpose of the study, and were asked to keep that information confidential, at least until after all participants had been tested and the study was closed.

2.6 Summary

In order to test whether implicit and explicit language attitudes are two different attitude constructs, the present study employed different methodologies to measure each attitude construct separately. An Implicit Association Test was used to measure the implicit, or immediate, reactions to the audio stimuli. The use of short audio stimuli for their phonetic qualities in accent recognition represents an innovation and an extension in IAT application. Self-reports were used to measure the explicit, or thoughtful, reactions to the same stimuli. One 25-minute computer-based experiment was created, comprised of three tasks involving these two methodologies: Task 1 was the IAT, and Tasks 2 and 3 were self-reports. By measuring the attitude constructs separately, this study hopes to gain deeper insight into the nature and formation of language attitudes.

CHAPTER 3

RESULTS

In this chapter, results are reported in the order of the tasks presented to participants. The IAT (Task 1) results are reported first, followed by the results of the explicit measure self-reports (Tasks 2 and 3). The latter include the results for the trait ratings, the binary and slider choice doctor preference questions, and the fairness of outcome questions. Results for the free-answer questions about speaker nationality are included in Section 3.5 at the end of the chapter.

The results of the REI distraction task, which are of no relevance to the present study, are not included. No participant's responses to the REI indicated extremes that warranted excluding from the study the participant's answers in the other tasks. The REI was included to require the participants to think about something other than foreign accent for a period of time before starting the explicit attitude tasks. Because all participants completed the REI, that goal is assumed to have been achieved.

3.1 IAT Results

The IAT results consist of latency data, measured in milliseconds. Latency was measured from the point that participants were exposed to the stimulus. For visual stimuli, that meant the moment the visual stimulus appeared on the computer screen. For audio stimuli, that meant the moment the audio recording began to play. Target concept and attribute categories, which appeared in the upper-right and upper-left corners of the

computer screen at the beginning of each section, remained in fixed position throughout each testing block.

3.1.1 Data preparation.

In the interest of maximizing internal consistency and minimizing the influence of extraneous factors, previous research (e.g., Greenwald et al., 2003), recommends the data be reviewed for extremes in response latencies. At one extreme, Greenwald, Nosek, et al. (2002) recommended eliminating data from respondents whose answer latencies were shorter than 300 ms for more than ten per cent of trials in combined task blocks. Such short response times in that quantity reflect an insincere participant whose responses are deemed flippant and not reflective of any true attitudes held. None of the respondents' data in this study were eliminated on the basis of this threshold. Each participant supplied 180 responses in combined task blocks. The participant with the highest number of responses measuring shorter than 300 ms in combined task blocks had seven, which is less than four percent (3.89%) of those trials.

At the other extreme, answers with response latencies of greater than 10,000 ms are also to be eliminated, in order to maintain the integrity of the scoring procedure. At this extreme, however, individual responses with response latencies beyond that threshold are discarded, not the entirety of the participant's data. Such responses are viewed as reflective of a lapse in concentration, and not as an indication of an insincere participant. In this study, responses with latencies of greater than 10,000 ms accounted for only three one-hundredths of one percent (.03% [8 of 29,700]) of the total responses.

In addition, responses that represent data that contain extreme numbers of sorting errors or are extreme outliers should also be eliminated. In the present study, six participants' data were eliminated on these grounds.

3.1.2 Special concerns for the audio IAT

Because audio stimuli have been used only once before in an IAT (Vande Kamp, 2002), the viability of their use for this methodology was verified by comparing the error rates and response latencies across stimulus type in the single-category testing blocks (Block 1 and Block 2). A finding of significantly more errors in the audio categorization tasks than in the visual tasks would indicate that participants had difficulty in categorizing audio stimuli, and would call into question the viability of the IAT for use with audio stimuli. In fact, however, the average error rate for all audio stimuli was 4.52% (95.48% correct answer rate), which was only .04% greater than the average error rate for all visual stimuli of 4.48% (95.52% correct answer rate). A two-tailed paired t-Test with an $\alpha = .05$ revealed that the difference between these two means is statistically insignificant [$t(3299) = -.061, p=.9518$].

The differences in response latencies across stimulus type in the single-category blocks were greater than those in error rates. Audio response latencies averaged 1,233 ms, while visual response latencies averaged 690 ms. The difference between these average latencies is significant [$t(3299) = 25.947, p < .0000 (=3.0895E-135), r^2 = 0.17$]. This is not, however, viewed as casting doubt on the legitimacy of using audio stimuli in an IAT. While it would have been reassuring to find similar response latencies between the two stimulus types, it is unrealistic. Because latency is measured from the moment the

participant is exposed to the stimulus, a discrepancy between latency measures for audio and visual stimuli should be expected. Participants see the entire visual stimulus immediately, but they have to wait for enough of the recorded audio stimulus to play to make the categorization task possible. Considering that the average length of the first iteration of each stimulus item is 1,229 ms, the average response time indicates that categorization was possible after hearing only about half the iteration, given that the participants took 690 ms to categorize visual stimuli ‘immediately’. It was concluded, therefore, that the linear nature of audio stimuli results in a longer latency, but does not render audio stimuli inappropriate for the IAT methods. Furthermore, because IAT scores are measured on a relative basis (i.e., latencies for foreign-accented speech are compared to latencies for US-accented speech), the IAT measures are valid and meaningful.

Based on the foregoing, it was concluded that the audio stimuli created the same kinds of measurable automatic reactions as the visual lexical stimuli. Importantly, this also reinforces the idea that listener’s identify speech as non-native very quickly.

3.1.3 The IAT score: The *D*-measure.

An IAT score is determined based on the differences in means between the two measurement test blocks. Specifically, the *D*-measure is calculated by dividing the difference between test block means by the standard deviation of all the latencies in both measurement blocks. This formula is similar to the Cohen’s *d*-measure of effect size (Cohen, 1977), but varies in the calculation of the denominator standard deviation. In the Cohen’s *d*-measure, the denominator is a pooled within-treatment standard deviation. The IAT *D*-measure denominator is the standard deviation computed from the scores in both

measurement blocks, without regard to the test block membership of the individual scores. The *D*-measure has also been shown to be superior to other IAT score algorithms because it reduces the potential for confounds related to variations in cognitive skills (Cai, Sriram, Greenwald & McFarland, 2004). The *D*-measure revealed an implicit bias ($D = .33$) in favor of US-accented speech, indicating a moderate IAT score. These results reveal, therefore, that the participants' implicit attitudes toward the US-accented speaker are positive relative to their implicit attitudes toward the foreign-accented speaker. This result held both for participants who self-reported their nationality as American as well as those participants who self-reported their nationality as something else.

3.2 Self-reports.

All statistical measures for explicit tasks were calculated, based on $\alpha = .05$. The four test conditions had 42, 34, 49, and 40 participants, respectively, as set out in Table 6. The results reported here are for data collected in the different-accent conditions, Conditions 1 and 2. The results for the data collected in the same-accent conditions, Conditions 3 and 4, which were included as control conditions to test the effect of the scripts on the dependent variables, are discussed separately in Section 3.4.

Number of Participants by Condition	
Condition	No. of Participants
Condition 1 (KOR-US)	42
Condition 2 (US-KOR)	34
Condition 3 (KOR-KOR)	49
Condition 4 (US-US)	40
Total	165

Table 6: Number of participants by test condition (KOR=Korean accent; US=US accent). The order of the speakers is indicated in parentheses after each condition number.

3.2.1. Measurement of effect of individual speaker traits

After listening to each recorded testimony, participants rated each doctor on the basis of 14 traits: *believability, credibility, trustworthiness, competence, knowledge, expertise, friendliness, persuasiveness, intelligence, likeability, warmth, judgment, presentation style, and clarity of presentation*. As reflected in Table 7, below, one-way ANOVAs of the individual traits indicated no consistent pattern. While the results were all directional toward the US-accented doctor for all 14 traits, the pro-US bias was shown to be significant only for *expertise* [$F(1,44)=4.535, p=.039, \eta^2=.093$].

The pro-US tendency was shown to be nearly significant for *competence* [$F(1,44)=3.276, p=.077, \eta^2=.069$], followed by *knowledge* [$F(1,44)=2.903, p=.095, \eta^2=.062$], *friendliness* [$F(1,44)=2.519, p=.120, \eta^2=.053$], and *persuasiveness* [$F(1,44)=2.442, p=.125, \eta^2=.051$]. No significant bias was indicated by the analyses of any of the other nine dependent variables (i.e., not for *believability, credibility, trustworthiness, intelligence, likeability, warmth, judgment, presentation style, or clarity of presentation*).

Statistical Significance of Speaker Traits		
Traits (Dependent Variables)	Significance and effect size measured by one-way ANOVA	Statistical significance?
expertise	$F(1,44)=4.535, p=.039, \eta^2=.093$	YES
competence	$F(1,44)=3.276, p=.077, \eta^2=.069$	NO
knowledge	$F(1,44)=2.903, p=.095, \eta^2=.062$	NO
friendliness	$F(1,44)=2.519, p=.120, \eta^2=.053$	NO
persuasiveness	$F(1,44)=2.442, p=.125, \eta^2=.051$	NO
believability	$F(1,44)=.028, p=.868$	NO
credibility	$F(1,44)=.581, p=.450$	NO
trustworthiness	$F(1,44)=.192, p=.664$	NO
intelligence	$F(1,44)=1.172, p=.285$	NO
likeability	$F(1,44)=1.134, p=.293$	NO
warmth	$F(1,44)=.040, p=.843$	NO
judgment	$F(1,44)=.109, p=.743$	NO
presentation style	$F(1,44)=1.302, p=.260$	NO
clarity of presentation	$F(1,44)=1.098, p=.300$	NO

Table 7: One-way ANOVA measures and significance of the effects of individual dependent variables

3.2.2. Doctor preference

After hearing both doctors testify, participants were asked to identify which doctor they would side with in the dispute. This question was asked twice. The first time, the question was presented as a binary choice. The second time, the question was presented as a slider choice (Likert scale of 1 to 11, with The First Doctor at 1 and The

Second Doctor at 11), in which participants were asked to state the extent to which they would side with one doctor over the other in the dispute.

3.2.2.1 Binary choice

Because the task was a binary choice, the use of an ANOVA is inappropriate; instead, a chi-square analysis was used to analyze the data. In the binary choice, the tendency to side with the Korean speaker was not found to be statistically significant in either the treatment [$\chi^2(1, N=70) = 1.429, p = .232$] or the control [$\chi^2(1, N=89) = 2.528, p = .11$]. This result is consistent with the 2008 Study findings, which also found no significant bias between the speakers for the dependent variable of case outcome [$\chi^2(1, N=67) = 3.43, p > .05$], even though it revealed a bias in favor of the US-accented doctor for believability [$\chi^2(1, N=68) = 6.87, p = 0.0088$], likeability [$\chi^2(1, N=66) = 13.67, p = 0.0002$], clarity [$\chi^2(1, N=67) = 38.97, p < 0.0001$], and speech style [$\chi^2(1, N=67) = 33.20, p < 0.0001$]. In stark contrast to the present study's findings, however, the trend in responses to selections for all dependent variables the 2008 Study was in favor of the US-accented speaker.

3.2.2.2 Slider measure

In order to assess any preference for either the Korean or the US-accented speaker, the slider scale was recoded such that a more positive response indicated a pro-US bias, regardless of whether the US-accented speaker was portraying The First Doctor or The Second Doctor. Subjects reported a pro-Korean bias [$t(69)=-2.64, p=.01$]. The responses to both questions indicated a tendency toward a bias in favor of the Korean

speaker, regardless of the doctor he portrayed. That is, when the Korean actor portrayed Doctor 1, participants tended to side with Doctor 1; when he portrayed Doctor 2, participants tended to side with Doctor 2. This effect did not obtain in the control condition [$t(88)=-1.64, p=.16$]. The difference in significance findings between the slider and binary choice measures underscores the difference between the two types of measures. While participants may exhibit ambivalence on individual slider choice questions, the measure is sensitive to an aggregation of slightly above neutral or slightly below neutral responses. Binary choice measures, however, require that participants be committed to one choice or the other. Unless most respondents strongly favor one of the choices, this methodology can translate to results of overall ambivalence or chance, even though the individual answers are forced-choice. The difference in findings between the binary and slider choice measures in this study is likely due to this difference in the nature of the methodologies.

3.3 Task 3: Fairness of outcome ratings

After hearing both doctors testify, and after selecting the doctor with whom they would side in this dispute, participants were asked two confirmatory questions. Participants were presented with the hypothetical role of alternate juror who heard all the testimony but did not get participate in rendering the verdict. The questions presented them with both possible verdicts, and asked them to rate how fair they thought the verdict was.

A significant bias toward ratings of fairness was found to exist when the reported finding was for the defendant physician and the defendant physician was Korean-accented rather than US-accented [$F(2,121)=3.708$, $p=.027$, $\eta^2=.058$]. The same bias was not found to exist when the defendant physician was US-accented.

A significant bias toward ratings of fairness was found to exist when the reported finding was for the plaintiff's expert and the plaintiff's expert was Korean-accented rather than US-accented [$F(2,121)=3.563$, $p=.031$, $\eta^2=.056$]. The same bias was not found to exist when the plaintiff's expert was US-accented.

These results confirm the slider choice finding of a bias in favor of the Korean-accented speaker.

3.4 Speaker nationality identification

After hearing each doctor testify, participants were asked to identify the native nationality of the speaker. After hearing the US-accented speaker, all responses (156/156) correctly identified his nationality.²⁹ As reflected in Table 8, however, only 7% (12/174) of the responses correctly identified the nationality of the Korean-accented speaker. This

²⁹ A total of 165 participants took part in the study. Each participant was assigned one of four test conditions. Because participation was not equally spread over the conditions, the total number of participants who heard the two accents differed. Condition 1 (Korean Dr. 1 and US Dr. 2) had 42 participants. Condition 2 (US Dr. 1 and Korean Dr. 2) had 34 participants. Condition 3 (Korean Dr. 1 and Korean Dr. 2) had 49 participants. Condition 4 (US Dr. 1 and US Dr. 2) had 40 participants. Participants in conditions 3 and 4 had two opportunities to identify the same accent. Several participants commented on the fact that the name 'Lee' in the script of Dr. 2 made them think Dr. 2 was Korean.

result confirms previous findings of an approximately 8% accuracy rate for US listeners in correctly identifying Korean accents (Lindemann, 2003).

Participant responses to nationality question after hearing Korean speaker				
Region	Country	No. Responses	Total Responses by Region	Percentage of Total Responses
Asia			84	48.3%
	China	49		
	Korea	12		
	Japan	8		
	Vietnam	4		
	Thailand	2		
	Unspecified Asian	9		
Latin Am/Spain			32	18.4%
	Hispanic	16		
	Spain	7		
	Argentina	4		
	Brazil	2		
	Nicaragua	1		
	Unspecified Latin American	2		
India/Pakistan			28	16.1%
Various Europe			15	8.6%
	France	7		
	Russia	3		
	Germany	1		
	Italy	1		
	Romania	1		
	Unspecified Eastern Europe	2		
Other Asia/Pacific			8	4.6%
	Philippines	5		
	Indonesia	2		
	Singapore	1		
Middle East			7	4.0%
	Iran	3		
	Afghanistan	1		
	Iraq	1		
	Palestinian	1		
	Saudi Arabia	1		
TOTAL			174	100.0%

Table 8: Participant nationality identification of Korean-accented speaker

Almost half of the participants (48.3%) identified the Korean speaker as being Asian. The remaining half of the participants, however, responded with a variety of nationalities from almost every part of the world.

3.6 Summary

The IAT results showed that participants' implicit attitudes towards the US-accented speaker are more favorable than towards the Korean-accented speaker. In contrast, the self-report results showed a consistent trend toward favoring the Korean-accented speaker. This trend was significant for the slider choice doctor preference measure and the confirmation tasks. It was not significant for the binary choice measure. This lack of significance for the binary choice measure is consistent with the 2008 Study findings, and may be due to the nature of forced-choice questions. The participants' implicit attitudes thus diverge from their explicit attitudes toward the same attitude objects.

The explicit measures of the individual speaker traits showed no significant results, except for expertise. The speaker trait results thus exhibited no pattern. This contrasts with the findings of the 2008 Study, which found speaker traits to vary by dimension: there was a bias toward the US-accented speaker for solidarity traits (likeability, believability, clarity of presentation, and presentation style), but no significant bias for either speaker for status traits (knowledge and competence) or for case outcome.

No correlations between the speakers and the traits were found to exist, except for a correlation between the defendant doctor, regardless of accent, and warmth. Additionally, none of the findings for the control conditions was found to be significant, indicating that the biases found were not due to script differences or order of presentation of the accents. Responses to the question asking participants to state the nationality of the foreign-accented speaker varied widely. Only 6.7% correctly stated that the speaker was Korean, although 48.3% stated the speaker was from an Asian country (specified or not). The remaining responses spanned the globe, listing countries from Latin America to the Middle East to Europe. The significance of this study's results is discussed in the next chapter.

CHAPTER 4

DISCUSSION

Two important findings emerged from this research. First, the IAT revealed an implicit bias in favor of the US-accented speaker over the foreign-accented speaker. Second, the explicit slider scale measures and confirmation tasks showed an explicit bias in favor of the foreign-accented speaker. This divergence between the participants' implicit and explicit attitudes toward the same attitude object supports the assertion in H1 that implicit and explicit language attitudes are distinct attitude constructs which should be measured separately and with unique methodologies. The results for the explicit attitude measures based on individual speaker traits showed no discernable pattern, and did not support H2.

4.1 Implicit attitudes: Task 1

Task 1's IAT results reveal an implicit bias in favor of the US-accented speaker over the foreign-accented speaker ($D = .33$). Specifically, the present study's results show that participants immediately associated the US accent more easily with *American + Good* and *Foreign + Bad* than with *American + Bad* and *Foreign + Good*. Because the IAT is a measure of the relative strength of association between stimuli and concept-attribute pairs (Nosek et al., 2005), however, the present study's IAT cannot be regarded as revelatory of attitudes towards US-accented or foreign-accented speakers in isolation (e.g., Lane et al., 2007).

4.1.1 The nature of implicit attitudes

The IAT purports to measure implicit attitudes, or the immediate affective associations (Gawronski & Bodenhausen, 2007) an individual makes based on stereotypes he or she possesses. Depending on the cognitive processing model invoked, these associations are characterized either as conceptual connections stored in memory (in system models, such as RIM) or as established activation patterns that are easily recalled and repeated (in processing models, such as the APE Model). Because the present research argues for the use of the APE Model, as discussed in Section 1.4, the latter characterization is used here. Although implicit attitudes are immediate reactions, and are not the result of thoughtful evaluation, they are nonetheless cognitively generated. While some researchers use the term *automatic* to describe implicit attitudes, others avoid the term, favoring *immediate* instead. In order to distinguish implicit attitudes from automatic reactions based on muscular or nervous reflexes, *immediate* is used in this discussion (Wittenbrink & Schwarz, 2007).

To illustrate the immediate but cognitive nature of implicit attitudes and the applicability of the IAT for measuring them, Gawronski and Bodenhausen (Gawronski & Bodenhausen, 2005) analogized the logic of the IAT to that of the Stroop test (Stroop, 1935). The Stroop test asks participants to name the font color of a stimulus word as quickly as possible. The stimuli are words are color terms. For some of the stimuli, the color of the font matches the color term represented (blue font for the word 'blue'). For other stimuli, the color of the font does not match the color term represented (red font for the word 'blue'). Because it is easier to process congruous information, participants

should perform better—be faster and more accurate—in naming the color when the font color and the color term correspond, than when they do not. The same notion underpins the IAT. Participants should perform better when the category label and attribute correspond in their minds (i.e., when they are already associated), than when the category label and attribute do not correspond. Whether the tasks involve congruous or incongruous associations, the participants are making cognitive connections. The present IAT results, therefore, can be characterized as revelatory of the immediate, cognitive associations that participants make in completing the sorting tasks.

In addition to their cognitive nature, the personal aspect of implicit attitudes bears emphasizing. IAT results reflect personal attitudes and associations that exist in the minds of the participants. Some researchers (Gehring, Karpinski & Hilton, 2003) have questioned whether the attitudes revealed through the IAT might reflect the general social ethos, and not the personal attitudes of the participants. Without thoughtful reflection, these researchers argue, participants simply repeat cultural beliefs gleaned from their environment in completing the IAT sorting tasks. If, however, IAT scores simply echoed society's associations, the implicit measures would correlate with explicit measures of broad cultural preferences more often than with individuals' personal preferences; however, they do not (Lane et al., 2007; Nosek & Hansen, 2004). The divergence between the explicit and implicit attitude measures in the present study support the conclusion that IAT results are not solely a measure of social values. Instead, attitudes measured by the IAT are distinct constructs, distinguishable both from the individual's own explicit attitudes and from environmental associations. For the present study's purposes, then, the implicit bias in favor of the US-accented speaker should not be

understood as merely the reflection of the standard language ideology or cultural biases, but instead as the reflection of the individual associations activated in the minds of the participants based on their personal experiences, beliefs, and stereotypes. These beliefs and stereotypes may be influenced directly or indirectly by social and cultural factors, but it is the individual's associations, and not the social factors that the IAT measures.

Although implicit attitudes are cognitively formed and are based on stereotypes and associations that exist in the mind of the individual, the extent to which the individual is aware of these associations is disputed. Many researchers believe the IAT can reveal biases of which individuals are unaware, are sometimes surprised by, and even deny having (Lane et al., 2007). Gawronski and Bodenhausen (2006) however, believe that individuals are aware to some extent of their attitudes, both implicit and explicit. As support for their belief, they rely on research (LeBel & Gawronski, 2006 as cited in Gawronski & Bodenhausen, 2006) that suggests that when participants are told to focus on their feelings during explicit measurement tasks, participants' explicit scores tend to converge with their IAT scores. Reasoning that the instruction would have no effect if participants were completely unaware of their implicit attitudes, these results were interpreted to mean that, when asked to do so, participants can accurately access their implicit attitudes. Other researchers continue to contend that by definition individuals cannot access their implicit attitudes (Nosek, 2007).

Whether they exist beneath the level of consciousness or not, however, it is generally agreed that implicit attitudes are beyond the individual's cognitive control (Botvinick, Braver, Barch, Carter & Cohen, 2001). This aspect of implicit attitudes exempts the IAT from concerns about strategic responding. Strategic responding occurs

when participants try to create a fictional, socially-desirable persona by answering questions in a way they think will achieve that goal (Wittenbrink & Schwarz, 2007). In fact, in debriefing sessions after the tasks were completed, several of the participants in this study commented to the examiner that they knew they were ‘not supposed’ to associate the US accent with good and the foreign accent with bad, and that they had tried not to, but that they found it difficult to do otherwise.

In summary, then, the results of the IAT task reveal that participants possess stereotypes and associations that favor US-accented speech over foreign-accented speech. Furthermore, these attitudes, which are not within the participant’s cognitive control, are formed through cognitive processes devoid of thoughtful reflection or evaluation. In fact, it is possible that the participants are not aware that they possess these stereotypes and beliefs, or are mistaken about their attitudes toward the attitude object. Finally, the IAT results are not merely an indication of society’s views, but reveal the participants’ personally-held, implicit attitudes.

4.1.2 The IAT results and previous language attitudes research

The immediate nature of these implicit attitudes and the means to measure them provide a new perspective for language attitudes research. Traditionally, quantitative language attitudes research on foreign accent has proceeded from the belief that listeners form their reactions to an accent based on their perception of the nationality of the speaker (Brennan & Brennan, 1981a; Bresnahan et al., 2002; Cargile & Giles, 1997; Nesdale & Rooney, 1996; Ryan, 1983). That body of research, largely grounded in SIT, maintains that the identity of the social group to which the speaker’s accent is believed to

belong determines the degree of prestige or stigmatization accorded the accent and, ultimately, the speaker. These studies generally equate the identity of the social group with nationality, and consider the listener's opinions about the accent to be a reflection of the stereotypes the listener possesses of the speaker's nationality.

While that definition of social group might apply to explicit attitudes, it does not explain implicit attitudes. The results of the current study show that participants responded to the audio stimuli in 1.23 seconds on average. The average length of each iteration of the audio stimuli (each audio stimuli consisted of three iterations of the same token with a one-second gap between iterations) was 1.28 seconds. Participants thus formed and registered their implicit attitudes upon or slightly before the completion of the first iteration of each audio stimulus. For two reasons it is unlikely that, in just under one and a quarter seconds, participants in this study identified the accent as belonging to any particular nationality. First, the accuracy rate for responses to the question in Task 2 asking participants to identify the nationality of the foreign-accented speaker after listening to two minutes of his speech was less than seven percent, indicating a very low level of familiarity with a Korean accent. If participants were so unfamiliar with the Korean's accent that they unable to identify it after two minutes of exposure to his speech, they were certainly not able to identify it after 1.23 seconds. The participants' immediate reactions, therefore, must be to something other than beliefs about the speaker's nationality. Second, participant responses of the nationality question ranged globally from nationalities of European, Middle Eastern, Asian, and Latin American origin. According to the nationality-based quantitative language attitudes studies, this

broad variety of nationalities should have evoked a broad spectrum of prestige and stigmatization reactions yielding no significant IAT bias in favor of either speaker.

This study's IAT results do show, however, that participants were easily able to identify the Korean accent as foreign. Participants were able to sort and categorize the accents into the *American* and *Foreign* categories quickly and with error rates of approximately those of the visual stimuli. This result is consistent with the findings of phonological studies of foreign accent that have shown listeners to be highly sensitive to variance from what is expected phonologically in their native language, and specifically to variance that suggests a foreign accent (Flege, 1984). Native-speakers of a language attend and respond quickly to phonological distinctions in the accent of others—often without conscious awareness—including distinctions on a segmental level, like voice onset time (Flege, 1984; Magen, 1998) as well as those on a suprasegmental level, like syllable stress (Clarke, 2003; Clarke & Garrett, 2004; Munro & Derwing, 1995). In fact, in the most extreme case, native English speakers, responding to fragments of syllables that included /tu/, were able to distinguish French-accented versions of English as non-native within 30 ms (Flege, 1984). Even naïve listeners have been shown to be readily able to perceive a foreign accent holistically (Flege, 1984; Magen, 1998; Munro & Derwing, 1995). The distinction that participants seem to be making, and seem to be able to make, then, in such a short amount of time is that the accent does not match their perceptions of what any US accent sounds like. In other words, the listeners perceive that the accent is different from what they expect to hear from a native US-English speaker: it is foreign. It is immediately upon the identification of the accent as foreign that implicit attitudes are formed. The ability to further define the accent specifically as Korean is thus

irrelevant for purposes of the IAT. Consequently, it is argued here that the immediate reactions measured by the IAT are not indicative of attitudes toward any specific nationality, but are reactions to the fact that the accent is foreign.

This interpretation of the IAT results is consistent with a fundamental application of SIT, SCM and ELIT, as long as social identity is defined more broadly than strictly in terms of nationality. At the core of all these theories related to intergroup behavior is the concept that individuals define others in terms of the groups to which they are believed to belong, and that they form attitudes accordingly. People prefer their own social groups to others', and thus prefer ingroup members to outgroup members. As such, it is sufficient for implicit attitude purposes to recognize that immediate reactions are based on the fundamental distinction of another person's social group membership as ingroup or outgroup (foreign). The present study has shown that foreign accent, a key indicator of social group membership, makes the foreign identity of the speaker highly salient and triggers the formation of an implicit attitude within a second and quarter of an utterance. Thus, further categorization of the speaker's social group by nationality is not necessary, and most likely not possible, in the amount of time it takes to form those implicit attitudes. Instead of equating social identity and group membership with nationality, then, the present study's IAT results suggest that for implicit attitudes outgroup should be defined simply as foreign.

It must be remembered, however, that the IAT is a comparative measure. The argument that foreign equates with outgroup for implicit attitudes should be viewed as untested outside of comparisons between foreign and native accents. In other words, the present research does not purport to address comparisons between two foreign accents

(e.g., Arabic-accented English versus Tamil-accented English). Because those accents both represent outgroups, such a comparison falls outside the purview of this research. Also untested are comparisons between accents of other versions of English (South African English versus Australian English), and those between accents of another version of English (e.g., British RP accent) and of a nonnative English speaker (e.g., Parisian French-accented English). There is research that suggests that British accents, in particular, are not necessarily viewed by North American English speakers as foreign (Creese & Kambere, 2003). It is not clear, therefore, that reactions to the accents of native speakers of other versions of English from around the world would be the same as those for nonnative English speakers. For that reason, the definition of ingroup and outgroup, and thus foreign, should not be assumed to be solely an external matter of defining the speaker's nation of origin.

In addition to foreign accents, the IAT could be applied to domestic regional and ethnic accents and sociolects. Applying the same ingroup/outgroup analysis as outlined for foreign accents, it would be expected that an IAT comparing reactions to accent variation within the same language would generate the same kinds of results as seen in this study. That is, those accents that are the same or similar to one's own accent would be expected to be viewed as ingroup, and those that are different as outgroup. As such, a similar implicit bias in favor of the ingroup accent would be expected. This study's results do not, however, indicate what the results would be for an IAT comparing a regional or ethnic accent or sociolect to a mainstream US English accent. In other words, if a speaker is asked to compare two groups to which he or she belongs (e.g., a local region and the nation), which group would the speaker favor implicitly? In such cases,

the salience of any particular identity trait may vary by group. That is, certain regional, ethnic or social groups might feel more strongly about their specific group membership than others. Additionally, standard language ideology—the hegemony of a language standard set by the most powerful social groups—might also play a role. Standard language ideology has been shown to impact explicit attitudes such that speakers of some regional and ethnic accents downgrade assessments of overt prestige of their own speech (Preston, 1989). Whether standard language ideology also affects speakers' implicit attitudes remains an open question.

The present study's interpretation of the IAT findings as indicative of an ingroup/outgroup distinction based on the identification of the accent as foreign is consistent with previous language attitudes research in two respects. First, the basic ingroup/outgroup distinction echoes Lindemann's (Lindemann, 2003) view that *foreign* is a highly salient category critically important to language attitudes. Although she did not make a distinction between reactions based on attitude construct, her recognition of a basic reaction based solely on foreignness is consistent with the implicit pro-US-accent bias found in the present study's IAT. Second, this basic distinction supports the language attitudes research that asserts that foreign accents are generally dispreferred (Bresnahan et al., 2002; Gudykunst & Ting-Toomey, 1990; Lippi-Green, 1994; Mulac et al., 1974). The present study's results clarify that the general downgrading of foreign-accented speech occurs immediately upon identifying the speech as non-native at approximately one and a quarter seconds after exposure. The present study's IAT results thus provide a new perspective on explaining those findings and applying the SIT, SCM and ELIT.

4.2 Explicit attitudes: Tasks 2 and 3

Tasks 2 and 3 measured participants' explicit attitudes toward the same accented speech used as the source for the stimuli in Task 1. In contrast to the IAT used in Task 1, Tasks 2 and 3 asked participants to self-report their reactions to the stimuli by answering a series of survey questions. Because they require introspection, these questions necessarily elicited the participants' explicit attitudes, which are those attitudes formed through thoughtful, evaluative processes (Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004). Because participants are aware of their own explicit attitudes, and because participants are able to cognitively control and filter both the formation and the reporting of these attitudes, self-reports are vulnerable to strategic responding (Wittenbrink & Schwarz, 2007).

In Tasks 2 and 3, participants were asked to imagine that they were jurors in a fictional medical malpractice trial. Participants were then asked to listen to the audio recordings of two actors portraying expert witnesses and answer questions about the testimony they had just heard. After hearing each witness's testimony, participants rated the speaker they had just heard on the basis of 14 criteria (believability, credibility, trustworthiness, competence, knowledge, expertise, friendliness, persuasiveness, intelligence, likeability, warmth, judgment, presentation style, and clarity of presentation) on a Likert scale of 1 (very low) to 11 (very high). In addition, after hearing both witnesses testify, participants were asked to rate the speakers relative to each other by indicating which doctor they would side with in the dispute. This question was asked in

two different formats: once as a binary choice ('Based on the testimony, which of the doctors would you side with in this dispute?' 'The First Doctor' or 'The Second Doctor'), and again as a slider scale from 1 (The First Doctor) to 11 (The Second Doctor). The binary choice simply asked participants to indicate which doctor they would side with in the dispute; the slider scale question asked participants to indicate on the scale 'the extent to which' they would select one doctor over the other. In Task 3, participants were told to imagine that they were alternate jurors who heard all the evidence, but could not participate in rendering a verdict. They were then asked to respond to two questions, each presenting a different outcome scenario, and asking them to state how fair they thought the verdict was.

Participants were randomly assigned to one of four test conditions. Participants in Condition 1 heard a foreign-accented defendant doctor (The First Doctor) and a US-accented plaintiff's expert (The Second Doctor). Participants in Condition 2 heard a US-accented defendant doctor (The First Doctor) and a foreign-accented plaintiff's expert (The Second Doctor). In Condition 3, both doctors were foreign-accented, and in Condition 4, both doctors were US-accented. Conditions 3 and 4 were included as control conditions to test for script effects.

4.2.1 Doctor preference (Part of Task 2 and Task 3)

In stark contrast to the implicit attitudes findings, all the explicit measures showed a trend toward favoring the foreign-accented speaker. The bias toward the foreign-accented speaker in the slider scale responses in the choice of doctors question in Task 2 in both mixed-accent conditions was significant, $F(2,121)=3.969$, $p=.021$, $\eta^2=.06$.

Likewise, the confirmation questions in Task 3 revealed a significant bias in favor of the foreign-accented speaker, both when the foreign-accented speaker was the defendant (The First Doctor), $F(2,121)=3.708$, $p=.027$, $\eta^2=.058$, and when the foreign-accented speaker was the plaintiff's expert (The Second Doctor), $F(2,121)=3.563$, $p=.031$, $\eta^2=.056$. Only the trend toward favoring the foreign-accented speaker in the binary measure failed to show statistical significance, $\chi^2(1, N=70) = 1.429$, $p = .232$. Because Conditions 3 and 4 generated no statistically significant results in the binary measure [$\chi^2(1, N=89) = 2.528$, $p = .11$] or the slider measure [$t(88)=-1.64$, $p=.16$] for doctor preference, it was concluded that there were no significant script effects.

4.2.1.1 The discrepancy between binary and scalar measures of doctor preference.

The binary measure asked participants to indicate which doctor they would side with in the dispute ('The First Doctor' or 'The Second Doctor'). Immediately following the binary measure question, participants were asked to 'please indicate on the scale below the extent to which [they] sided with one doctor versus the other'; the 11-point scale was divided into integer increments from 1 ('The First Doctor') to 11 ('The Second Doctor'). While both measures showed a trend toward favoring the foreign-accented speaker regardless of role (i.e., regardless of whether the foreign-accented speaker was the defendant or plaintiff's expert), the binary measure's results were not statistically significant; the slider measure's results were. The difference in the significance of results for the two measures of doctor preference is perhaps due to the reluctance of participants

to select extremes, perhaps indicates the higher sensitivity of the slider measure, and perhaps underscores the absence of script effects.³⁰

4.2.2 The confirmation task (Task 3)

Confirmation of the participants' explicit bias in favor of the foreign-accented speaker is found in the results of the outcome opinion questions in Task 3. In this Task, where participants were asked to imagine themselves as alternate jurors who heard the evidence but did not participate in determining the verdict, two case outcomes were presented. In the first, participants were told that the jury found in favor of the defendant (The First) doctor, the treating physician. In the second, participants were told that the jury found in favor of the plaintiff. Participants reacted to the two outcomes by indicating how fair they thought the verdict was on a Likert scale of 1 (very unfair) to 11 (very fair).

When the foreign-accented speaker was the defendant (The First) doctor, participants exhibited a significant preference for a verdict in favor of the defendant, [$F(2,121)=3.708, p=.027, \eta^2=.058$]. The same bias was not found to exist when the defendant physician was US-accented. When the foreign-accented speaker was the plaintiff's expert, participants exhibited a significant preference for a verdict in favor of the plaintiff, [$F(2,121)=3.563, p=.031, \eta^2=.056$]. The same bias was not found to exist when the plaintiff's expert was US-accented.

³⁰ Interestingly, responses to the binary doctor preference question in the 2008 Study also failed to meet the threshold of statistical significance.

4.2.3 Summary of the doctor preference explicit findings

Together, then, the doctor-choice explicit measures in Tasks 2 and 3 indicate a bias in favor of the foreign-accented speaker, which was significant for Task 3 and the slider measure in Task 2. These results show that, in contrast to their implicit attitudes toward the speakers, the participants' thoughtful reaction was to favor the foreign-accented speaker.

These explicit results may at first appear anomalous. The participants' explicit bias in favor of the foreign-accented speaker, however, may be explainable in the context of the participant pool. As previously stated, participants were recruited from introductory linguistics classes, including an introduction to sociolinguistics class. Almost half of the study's participants came from the sociolinguistics class, which coincidentally was studying attitudes toward foreign accent at that point in the semester. Also mentioned earlier, a number of students expressed their frustration at not being able to control their answers to the IAT. Their stated desire was to fight their inclination to favor the US-accented speaker. While they could not control their performance on the IAT, their explicit answers could be controlled.

That is not to say that these explicit attitudes are not real. Because this was an anonymous survey, it must be assumed that the study results accurately reflect the participants' explicit attitudes. External influences, such as the knowledge gained in class or an awareness of social standards, might contribute to formation of their explicit attitudes, but the attitudes expressed must be assumed to be authentic unless there is evidence that a participant holds one attitude, but reports another. That might have happened, for example, had this not been an anonymous study, or had participants feared

their answers would be reported back to the professor. Unlike the IAT, which does not involve introspection, self reports are vulnerable to strategic responding. There is, however, no evidence to suspect that this is the case in the present study.

4.3 The divergence between implicit and explicit attitudes.

The different results for implicit and explicit attitudes in this study support the notion that implicit and explicit attitudes are, in fact, two separate attitude constructs. Explicit attitudes are introspectively identifiable and cognitively controllable (Botvinick et al., 2001; Nosek et al., 2007), and therefore subject to social pressures to conform. In the present study, such external pressures may have promoted the explicit bias toward the foreign-accented speaker. In contrast, implicit attitudes are introspectively unidentifiable. Individuals might not be aware that they make certain associations, that they view the attitude object in a certain way, or that they even have an opinion or attitude toward the attitude object at all. As a result, some implicit attitudes are not consciously accessible, even if people are motivated to retrieve them (Nosek, 2007). The participants in this study were thus able to cognitively control their explicit attitudes, but were unable to do so with their implicit attitudes. As mentioned previously, some participants even expressed their frustration at not being able to control their performance on the IAT. For those participants, the IAT caused them to become aware of both their implicit bias toward the US-accented speaker and their inability to mask that bias in the task. Previous research on phobic responses has found that participants who explicitly report not being afraid of spiders scored similarly on IATs to those who explicitly reported being very

afraid of spiders (de Jong, van den Hout, Rietbroek & Huijding, 2003). Similar to the present findings, then, that research indicates that individuals can overcome an immediate affective reaction and profess, and ostensibly believe, a quite different explicit attitude toward the same object. Along similar lines, a study conducted on children aged six to ten years old showed that, while IATs revealed the same racial attitudes for children of all ages tested, explicit reports indicated a trend toward more egalitarian attitudes in the older age groups (Baron & Banaji, 2006). As the children became more aware of social standards, they changed their explicit racial attitudes. Exposure to these social standards did not affect their implicit attitudes, however, which remained stable across the age groups. That conclusion is consistent with the present study's findings of how maturity, social pressure and learning can influence participants' explicit attitudes toward foreign-accented speech but leave the implicit attitudes unaffected.

Importantly, this difference in findings for the two attitude constructs shows that the same individual can process different attitudes toward the same attitude object, each of which is accessible using unique measurement methods. Measuring both the implicit and explicit attitudes an individual has toward the same attitude object thus provides a more complete picture of the individual's attitudes, judgment, social perception, and potential behavior than does measuring only one of these attitude constructs to the exclusion of the other (Rohner & Björklund, 2006).

In addition to supporting the conclusion that implicit and explicit attitudes are separate constructs, the findings of divergence of attitudes in the present study emphasize the need to measure both attitude constructs in order to obtain a comprehensive picture of the participants' attitudes. A self-report task alone would not have revealed the implicit

bias toward the US-accented speaker. An IAT alone would not have revealed the explicit bias in favor of the foreign-accented speaker. Together, these methodologies give a much more complete picture of the participants' attitudes, than either could alone.

Three additional aspects of this divergence in attitudes require mention. First, neither attitude construct can be viewed as being more 'real' than the other (e.g., Lane et al., 2007). It is not accurate to think of the IAT as a lie detector test that exposes an individual's 'true' attitudes toward an attitude object. Both implicit and explicit attitudes are cognitively formed: implicit attitudes on the basis of immediate affective associations and stereotypes, and explicit attitudes on the basis of thoughtful evaluative processes. They are both reflective of the individual's reactions to the stimulus. The fact that the formation of explicit attitudes may be influenced by social or other external factors does not make them any less real. If they are reported honestly, they are as real as the individual's implicit attitudes. Only in cases where explicit attitudes are consciously misrepresented can those attitudes be said to be less authentic. Second, the difference between the implicit bias in favor of the US-accented speaker and the explicit bias in favor of the foreign-accented speaker does not indicate a change in attitude. It is not the case that the divergent attitudes mean that the pro-US implicit attitudes changed to the pro-foreign explicit attitudes between tasks. Implicit attitudes remain separate from, and continue to co-exist alongside, the individual's explicit attitudes. Implicit and explicit attitudes thus remain distinct, but related, attitude constructs (Rohner & Björklund, 2006). Finally, it is unclear how much of an effect the experimental design itself had on the attitude results. The IAT presented decontextualized tokens to participants, while the

explicit tasks presented participants with contextual information both with the stimuli and as background. The effect of this difference in context, if any, is unknown.

4.3.1 Divergent attitudes and behavior

Despite indications from the present study's results, implicit and explicit attitudes are related and tend to co-vary: positive implicit attitudes are usually echoed in positive explicit attitudes and vice versa.³¹ Co-variance suggests that individuals tend to be consistent in their attitudes toward the same attitude object. The extent to which they co-vary, however, is a subject of dispute among researchers (e.g., Asendorpf, Banse & Mücke, 2002; Karpinski & Hilton, 2001). The degree of covariance appears to depend upon such factors as the strength of the attitude (the more strongly-held the attitude, the more correspondence between the constructs) and self-presentation concerns (the more egregious the individual believes his or her attitude to be, the less correspondence) (e.g., Lane et al., 2007). When the attitude constructs co-vary, behavior prediction is straightforward. When the attitudes diverge, as in the present study, the question is raised as to which attitude construct will control behavior.

Both implicit and explicit attitudes have been found to predict behavior (Perkins et al., 2008). Specifically with respect to social stereotyping and prejudice, however, the IAT has been found to be highly predictive of negative behavior toward outgroup members. Negative implicit attitudes towards African Americans, for example, has been shown to predict more negative non-verbal behaviors toward an African American

³¹ Irrespective of this general co-variance, implicit and explicit attitudes are nonetheless separate attitude constructs (e.g., Lane et al., 2007), a position supported by repeated quantitative studies (e.g., Nosek et al., 2005).

interviewer (McConnell & Leibold, 2001), more negative interpretations of ambiguous actions by African Americans (Rudman & Lee, 2002), and even lower likelihood of prescribing certain critical medications for African American patients (Lane et al., 2007).

There is also evidence that IAT results can predict ‘lower level perceptual and cognitive events’ (Lane et al., 2007). For example, negative implicit attitudes towards African Americans were found to result in a lower threshold for perceiving hostility in African American faces than in European American faces (Hugenberg & Bodenhausen, 2003). Additionally, negative attitudes toward an outgroup appear to deplete cognitive resources in interactions with members of that group (Richeson & Shelton, 2003). In the Richeson & Shelton study, an IAT revealed negative attitudes towards African Americans. European American participants performed worse on cognitive skills tests following interaction with African American examiners than following interaction with European American examiners. The researchers concluded that the cognitive effort expended overcoming the implicit bias against the outgroup members caused diminished performance on the subsequent test of cognition.³² The present study’s results suggest, then, that the negative bias revealed to exist against foreign-accented speakers can have real behavioral consequences.

³² This conclusion was challenged based on doubts about the meaning of the IAT results (Gehring et al., 2003). The challenge posited alternative explanations for the IAT effects, but did not question the assertion that after interaction with the African American examiners, the participants experienced diminished cognitive performance on the Stroop test.

4.3.2 Hypothesis 1 partly confirmed

This study's findings of divergent implicit and explicit attitudes toward the same accented speech confirms Hypothesis 1, in part. Specifically, these findings confirm the hypothesis that implicit attitudes would be biased in favor of the US-accented speaker. Based on the findings from the 2008 Study, however, Hypothesis 1 posited that it was thought that explicit attitudes measures would show no bias. Instead, the self-report results revealed explicit attitudes to be biased in favor of the foreign-accented speaker. Most importantly, these divergent results support the conclusion that implicit and explicit attitudes are two distinct attitude constructs.

4.3.3 Implications of the attitude divergence for language attitudes research

The multidimensional nature of attitude is recognized in the language attitudes literature. Listener reactions have been described as being comprised of at least affective and cognitive (or evaluative) components (Cargile & Giles, 1997), and, at times, also behavioral predispositions (Bradac, Cargile & Hallett, 2001; Cargile et al., 1994). Cargile and Giles (1997) explored the role of *affect* (defined as feelings or emotion, and sometimes as mood) in the formation of language attitudes, asserting that listeners react both emotionally and evaluatively to the speaker and the message.³³ This assertion appears to be generally consistent with the implicit/explicit attitude framework presented

³³ That study also considered the role of social identities and message content in the formation of language attitudes, finding that social identity influenced only attractiveness ratings and those only when the message was aggressive. Furthermore, social identities were found to have an indirect effect on evaluations by increasing the salience of the listener's social identity. The conclusion drawn was that social identities have a selective effect on speaker evaluations.

in the IAT and related attitudes literature. Because the language attitudes literature provides no clear definition of what is meant by affect, however, its consistency with present attitude research remains unclear.

Importantly, while there is theoretical discussion of the existence of affective (emotional) reactions toward language variants in the language attitudes literature, the field's research provides no quantitative proof that they exist. To the exclusion of all implicit measures, the language attitudes studies positing affective reactions have employed explicit measures of attitude. That is, these studies, many of which predated the development of implicit attitude measures, uniformly relied on methodology requiring introspection—including interviews and surveys like those related to the 'matched guise' (Lambert, 1967) approach—even when purporting to measure affective reactions. These introspective methodologies necessarily invoke evaluative cognitive processes, and therefore cannot capture implicit attitudes or immediate affective (emotional) reactions.

The results of the present study clearly illustrate that introspective methodologies, which capture only explicit attitudes, by themselves do not provide a complete picture of the individual's attitudes. It is argued here, therefore, that language attitudes research should define attitude in terms of implicit and explicit constructs, and employ different methodologies to measure each type of attitude: implicit measures for implicit attitudes, and self-reports for explicit attitudes. This approach would be consistent with attitude and identity studies conducted in the field of psychology (Kim, Sarason & Sarason, 2006). Furthermore, if other distinctions in attitude are discussed, those distinctions should be explained in terms of the implicit/explicit framework, so that language attitudes and

reactions to foreign accent can be discussed consistently within and across the academic fields of linguistics and psychology, the two fields this research has always spanned.

4.4 Implications for cognitive models

This study's divergent implicit and explicit attitude findings also impact the selection of cognitive models used to explain attitude processing. Divergence suggests dual processes that might work separately, jointly, competitively, or cooperatively in forming attitude and affecting social perception, judgment and behavior (Nosek, 2007). In fact, the invention of the IAT and other implicit measurement methodologies has caused a re-analysis of the conceptualization of the cognitive processes underlying attitude formation and change, in general.

‘[These implicit measurement innovations] have spawned dual-process theories that, among other things, distinguish between the mind as we experience it (explicit), and the mind as it operates automatically, unintentionally, or unconsciously (implicit). These dual-process accounts emphasize the familiar psychological constructs such as self-concept, attitudes, and stereotypes might exist in multiple forms in a single individual and that understanding the psychology of individuals involves what people believe about themselves, and what happens in minds without explicit permission.’ (Nosek, 2007, p. 184).

Early language attitudes research did not directly address the cognitive processing of attitudes (e.g., Ryan, 1982)). Consistent with general attitudes studies of the time (Chaiken & Stangor, 1987; Mackie, Worth & Asuncion, 1990), however, quantitative language attitudes research (e.g., Frumkin, 2007; Giles, Williams, Mackie & Rosselli, 1995; Mackie et al., 1990; Sobral Fernández & Prieto Ederra, 1994) since the early 1990s

generally has relied on ELM's peripheral route (superficially) and central route (thoughtfully) dichotomy to explain attitude formation. Those studies posited that attitude variance within individuals toward the same attitude object was explainable as being a function of the individual's elaboration likelihood, or proclivity to thoughtfully, instead of superficially, process the speaker's message. Superficial processing would allow extraneous factors, like stereotypes about nationality, to dominate attitude formation, while thoughtful processing would focus attitude formation on the merits of the message.

ELM, however, does not easily explain the present study's findings. First, it is not at all clear whether ELM can be applied to anything other than persuasive messages. The present study's IAT stimuli that consist of decontextualized lexical items cannot be said to be persuasive messages. Second, ELM does not allow for an individual to hold more than one attitude toward an attitude object at a time. The present study's results that show participants simultaneously held divergent attitudes towards the same attitude objects (i.e., US- and foreign-accented speech) are not contemplated by ELM, which explains attitude formation as a single event. In the process of attitude formation, an individual processes the message either centrally or peripherally, and forms his or her attitude toward the object accordingly. Processing can alternate between the routes, but the routes remain separate and do not inform each other; consequently, only one attitude is held by the individual at any one time. Finally, it should be emphasized that ELM does not specifically link peripheral processing with implicit attitudes, or central processing with explicit attitudes. In fact, ELM's description of peripheral processing as being based on cognitive shortcuts implies that the attitudes formed in this way are not immediate affective reactions, but are rapidly-formed evaluative reactions. Because the IAT

completely bypasses thoughtful evaluation, the present study's IAT results would remain unexplained under ELM.

Apart from ELM, Cargile and colleagues (Cargile et al., 1994) posited a theoretical model of social processes involved in the formation of language attitudes.³⁴ Emphasizing the role of perceived identified cultural factors in attitude formation, their social process model of language attitudes (p. 214) presents a theoretical explanation of attitude processing by defining the roles that affective and cognitive reactions, as well as behavioral predispositions, play in the formation of attitudes. While it recognizes affective and cognitive reactions as components of attitude formation, the model does not clearly delineate the roles of each component, and does not characterize them as separate attitude constructs, or as contributing to the formation of separate attitudes.

Bradac and colleagues (Bradac et al., 2001) presented a more detailed version of this same model that included a distinction between automatic and controlled information processing, citing Greenwald and Banaji (Greenwald & Banaji, 1995), who had discussed this distinction in terms of implicit and explicit attitudes. Ultimately, however, the Bradac study proposed the use of ELM to explain how attitudes are formed. In the Cargile-Bradac model, it is not clear whether an individual may hold more than one attitude towards the same attitude object simultaneously, or whether the components of attitude formation contribute to one overall attitude or reaction.

³⁴ Kristiansen's (Kristiansen, 2001) model, explains how language attributes are connected to social stereotypes on a phonological level through Prototype Theory, and how those social stereotypes are then attributed to the speaker metonymically. It does not purport to address the formation of attitudes, in general.

A more comprehensive and consistent explanation for this study's findings is found in the APE Model, a dual-processing model that focuses on dynamic cognitive processing.³⁵ According to the APE Model, evaluation responses (attitudes) are formed through either associative or propositional processes. The former are characterized as immediate reactions to a given attitude object based on cognitive connections made because of similarity of features or proximity in time or space (Gawronski & Bodenhausen, 2007) and can be measured by implicit measures like the IAT. Propositional processes, in contrast, are those in which the consistency of a proposition is determined in light of other relevant propositions held. Any time an individual consciously assesses their own opinion or attitude, then, propositional processes are used. Consequently, tasks requiring introspection necessarily involve propositional processes.

For present purposes, then, the difference between the IAT results (measuring immediate reactions), and the self-report results (measuring conscious, introspective reactions), are explainable in terms of the means of cognitive processing. Unlike ELM, the APE Model does not posit cognitive processing to be dependent upon the individual's proclivity to process information in one way or another. Under the APE Model, individuals always have an immediate, associatively-processed reaction, and, if they are asked to evaluate and report their reactions, they also have a thoughtful, propositionally-processed reaction.

³⁵ RIM could also be applied to explain this study's results. RIM focuses more on what is stored in an individual's memory, and less on processing. For that reason, and because the APE Model literature (Gawronski & Bodenhausen, 2007) specifically addresses the applicability of the IAT in measuring associative responses, the APE Model is argued for here.

4.4.1 Cognitive models and attitude change

An important aspect of conceptualizing the cognitive processing of attitudes is its implications for attitude change. According to the APE Model, the immediate affective associations the individual makes are those that are closely related in the individual's mind. Those associations are ingrained and difficult to overcome. On the contrary, attitudes derived from thoughtful reflection can be affected simply by adding contradictory propositions to the thought process.

In the present study, then, the participants' implicit bias toward the US-accented speaker is revelatory of processing activation patterns based on stereotypes and associations the participants possess. Those patterns are entrenched, so the bias is difficult to change. The explicit bias in favor of the foreign-accented speaker, however, is based on thoughtful, propositional processing in which the truth value of the various relevant propositions—including those related to implicit attitudes—is assessed. The attitudes formed through this processing can be affected by the introduction of contradictory propositions.

ELM suggests the opposite view of attitude change. Because the formation of thoughtful reactions requires more cognitive effort than superficial reactions, ELM maintains that attitudes formed through the central route of processing are difficult to change. Opinions formed through the peripheral route, which is characterized as superficial processing, are thought to be easily changed. This has led previous language attitudes researchers who have relied on ELM (e.g., Frumkin, 2007) to conclude that the biases related to stereotypes, like those based on foreign accent, are changeable simply by raising the issue of foreign identity to the level of consciousness. This is thought to force

the listener to thoughtfully address the issue of foreign identity, resulting in central route processing and a focus on the content of the message.

In stark contrast, the APE Model, suggests that merely raising the issue of foreign identity to the level of consciousness will do nothing to change negative implicit attitudes about the foreign-accented speaker. Implicit attitudes are a reflection of associative, immediate processes, which cannot be affected adding information that will be propositionally processed. Instead, changing implicit attitudes requires that the immediate cognitive associations somehow be changed. This requires significant effort, according to the APE Model (e.g., Gawronski & Bodenhausen, 2006), including the formation of new associations. Previous research has found that negating current associations is not as effective as creating strong, new, positive associations (Gawronski, Deutsch, Mbirikou, Seibt & Strack, 2008; Kawakami, Dovidio, Moll, Hermsen & Russin, 2000; Rydell, McConnell, Strain, Claypool & Hugenberg, 2007).

4.5 The trait dimension ratings

Previous quantitative language attitudes research has consistently theorized that listeners react to speakers in different ways, in part based on the trait of the speaker being evaluated (Cargile & Giles, 1997; Yzerbyt et al., 2005). In that body of research, speaker traits are generally divided into two dimensions, the solidarity dimension and the status dimension (sometimes referred to as the warmth and competence dimensions). Traits like friendliness, warmth, and likeability are thought to fall within the solidarity dimensions,

while traits like intelligence, competence, and knowledge are thought to fall within the status dimension.

The theoretical basis for this distinction is thought to lie in SIT. SIT suggests that self esteem and group membership—the essence of intergroup behavior—require that outgroup members be negatively compared to ingroup members. This downgraded rating of outgroup members occurs on a trait-dimension basis, so that positive judgments in one dimensions result in negative judgments in the other. SCM further suggests that this negative comparison requires compensatory and complementary judgments, so that rating an outgroup member positively in one dimension requires a negative rating in the other in order to guarantee an overall negative rating for the outgroup member as compared to the ingroup.

Accordingly, in addition to the doctor preference questions, participants were asked in the explicit tasks (Tasks 2 and 3) to rate each speaker on a Likert scale from 1 (very low) to 11 (very high) in terms of fourteen speaker traits immediately after hearing the speaker's recorded testimony. Those speaker traits, representing both the status and solidarity dimensions, were designated in this study as: believability, credibility, trustworthiness, competence, knowledge, expertise, friendliness, persuasiveness, intelligence, likeability, warmth, judgment, presentation style, and clarity of presentation.

The 2008 Study results supported this dual-dimensional structure. The 2008 Study, which only tested six speaker traits (believability, likeability, knowledge, competence, presentation style, and clarity of presentation), found a significant bias in favor of the US-accented doctor for believability, likeability, presentation style and

clarity of presentation.³⁶ No significant bias was found to exist for knowledge or competence. The 2008 Study results, then, support the alignment of believability with likeability, style, and clarity preference as solidarity traits, and competence and knowledge as status traits. It was expected that a similar pattern would be found in the present study's results.

4.6 H2 not supported by the results

H2 expected that traits in the solidarity dimension would favor the US-accented speech and those in the status dimension would be ambivalent, confirming the validity of the two-dimension framework for analyzing and explaining explicit attitudes toward foreign-accented speech. That hypothesis was based partly on the existing language attitudes research and on the results of the 2008 Study. Contrary to expectations, however, the present study, which tested fourteen separate speaker traits as dependent variables, found no consistent pattern in the results. In fact, only expertise was found to have a significant result in favor of the US-accented speaker. None of the results for the remaining traits were found to be significant.

³⁶ No significant result was found for case outcome, which was also tested in the 2008 Study.

The reasons for the differences in significance findings between the present study and the 2008 Study might be due to differences in methodological choices. First, the 2008 Study presented participants with both doctors' testimonies, and then asked participants to make a binary choice between the two doctors for each trait. That binary-choice methodology, selected because of its ecological validity for the courtroom where jurors are required to make such choices, forced participants to make a choice, even when they might have felt ambivalent. Scalar evaluations are statistically more sensitive to slight biases than are binary choices. Second, participants in the current study rated each doctor on all fourteen traits immediately after hearing that doctor testify. As such, the doctors were not being rated in comparison with one another, but were being rated independently. This indicates a different type of analysis. Third, the number of dependent variables was more than double the number in the 2008 Study, which might have mitigated the statistical effect of fewer variables. Additionally, the 2008 Study was Web-based, with an average participant age of 46.6 years old. The difference in age groups between the two studies might indicate an effect of age on perceptions of foreign-accented speech.

4.7 Summary

This study yielded two important results. First, participants' implicit reactions showed a bias toward the US-accented speaker over the foreign-accented speaker. This indicates a listener's immediate reaction to speech, registered upon identification of a speaker's accent as native or foreign, favors a native accent and downgrades a foreign accent. At the same time, explicit results showed that participants formed thoughtful

reactions that favored the foreign-accented speech over the US-accented speech. The divergence between the implicit and explicit results is the second important finding in this research. The divergence supports the conclusion that implicit and explicit attitudes are separate attitude constructs, which are both real attitudes that have potential behavioral consequence. Accordingly, the present research argues that both attitude constructs should be measured and discussed is assessing attitudes toward foreign accent. This requires the use of separate and appropriate measures for each construct.

The divergence also has consequences for the selection of a cognitive model to describe attitude formation processes and for procedures to change or mitigate negative implicit or explicit attitudes. The present study advocates the use of the APE Model, a dual-processing model that can explain the simultaneous co-existence of implicit and explicit attitudes, that recognizes the IAT as an appropriate method to measure implicit attitudes.

CHAPTER 5

CONCLUSION AND FUTURE RESEARCH

This study provides quantitative support for conceptualizing language attitudes toward foreign accented speech as comprised of two separate attitude constructs: implicit and explicit attitudes. Implicit attitudes are formed immediately upon recognition that the accent is foreign. Explicit attitudes are formed evaluatively after thoughtful reflection. An individual holds both implicit and explicit attitudes toward an attitude object simultaneously.

The results of the present study show that there is an implicit bias that favors US-accented speech over foreign-accented speech. Applying SIT and related theories to explain this result, the negative immediate reaction to foreign-accented speech is the result of identifying the speaker as an outgroup member based on accent. This is consistent with the language attitudes literature that has shown that listeners generally tend to downgrade foreign-accented speech and speakers simply because the speaker and accent are foreign. These implicit attitudes, or immediate reactions, do not require the further definition of the speaker's social identity beyond foreign or outgroup. On the contrary, the present results suggest that nationality does not define implicit attitudes, which are formed before the national identity of the speaker can be determined.

Explicit attitudes, which are formed after some amount of thoughtful reflection, comprise a distinct attitude construct from implicit attitudes. As such, the same individual can hold divergent implicit and explicit attitudes toward the same attitude object. The present study's results reflect such a situation. The participants' pro-US-accent implicit

bias co-occurred with pro-foreign-accent explicit bias. This result underscores the distinct nature of the attitude constructs: implicit attitudes which are immediately cognitively formed, but over which individuals have no cognitive control, and explicit attitudes which are thoughtfully cognitively formed, and over which individuals retain cognitive control. The participants, many of whom were learning about standard language ideology in their sociolinguistics class at the time of their participation in this experiment, could answer the explicit attitudes questions in accordance with what they had learned in class. They could not, however, control their responses to the IAT tasks. Comments made by participants indicating their frustration at not being able to control their answers to the IAT confirm this conclusion.

This distinction between implicit and explicit attitudes, which this study has shown to apply to language attitudes, might serve as a means to explain the findings in previous language attitudes studies that have eluded clear and consistent explanation. The framework for understanding attitudes toward language variation can thus be understood in terms of attitude construct, consistent with general attitudes research, instead of by various definitions of reaction type (e.g., affective, evaluative, behavioral). Additionally, while explicit attitudes might be affected by national identity and trait dimension, implicit attitudes can remain exempt from concern related to such parameters. Thus, previous research suggesting a general negative reaction to foreign accent can be explained as implicit attitudes, while reactions based on nationality or trait dimension, which are possible only upon identification of the accent and additional cognitive effort, can be explained in terms of explicit attitudes.

Importantly, however, the present study also emphasizes the need to apply appropriate methodologies to access the different attitude constructs. Because implicit attitudes cannot be captured by measures that require introspection, the self-reports and interviews traditionally used in language attitudes research—including those involved in ‘matched-guise’ studies—measure only explicit attitudes and ignore implicit attitudes. In order to capture implicit attitudes, implicit measures, such as the IAT must be used. Likewise, in order to capture explicit attitudes, explicit measures, such as self-reports or interviews, must be used. By measuring both types of attitudes, a more comprehensive picture of attitude is obtained.

Moreover, the distinction between attitude constructs implies that single-attitude models of cognitive processing—including the persuasive-message processing model, ELM—are insufficient. Dual processing models, such as the APE Model, that can comprehensively explain attitude processing for all types of messages and stimuli in terms of implicit and explicit attitudes are more appropriate.

Implications for the fields of sociolinguistics and psychology, therefore, are mainly threefold. First, understanding that an individual may hold two separate attitudes toward the same attitude object simultaneously, one implicit and the other explicit. Distinctions in reaction should first be attributed to this dual nature of attitude, instead of some external or hypothetical construct. Second, clarifying the attitude construct distinction requires the use of separate methodologies for measuring each attitude construct. Third, recognizing the distinction between attitude constructs and the ability of an individual to hold two attitudes toward the same object simultaneously narrows the selection of an appropriate cognitive processing model to those that can explain

processing comprehensively and consistently. The APE Model was selected as an appropriate choice, both because it is a dual-processing model and because the APE Model literature specifically discusses its compatibility with the IAT and other implicit measures.

A methodological implication of the present study for future IAT research includes the use of audio stimuli. Although audio stimuli have been used in a previous study, the present study establishes their use for linguistic cues on a phonetic level. Reactions to various accents or other linguistic cues can be measured using the methodology outlined in this research.

Finally, of course, the present study represents a small start in a new direction of language attitudes research. Further research is planned to test a number of foreign accents, including accents of other versions of English, to more clearly define the ingroup/outgroup distinction posited in this research. Likewise, various regional and ethnic accents and sociolects of the same language will be tested to see if the ingroup/outgroup distinction applies in a within-language context. Finally, further research is necessary to determine whether standard language ideology affects implicit attitudes. To that end, regional and ethnic accents, as well as sociolects, will be tested against mainstream US English accents. Finally, additional research is necessary to determine whether and to what extent implicit or explicit language attitudes govern behavior.

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APPENDIX A
PHYSICIANS' TESTIMONIES

The First Doctor's Testimony

At 2:10 a.m. I examined Ms. Brooks. She was in labor following a premature rupture of membranes at 34 weeks gestation. Fetal heart tones demonstrated multiple late decelerations without adequate recovery, evidencing fetal distress and the potential for imminent fetal demise. Emergent delivery was indicated. I performed a pelvic exam and determined fetal station to be minus one, meaning that the baby was still in the uterus and had not descended far into the birth canal. The mother's pushing had been inadequate to accomplish delivery, so I instructed the mother to stop pushing and called for a C-section. We wheeled the patient to the O.R.

At 2:25 the circulating nurse attempted to insert the Foley catheter. When she separated the patient's legs, she called out that the baby was crowning at plus two station. That means that the head was out of the uterus, past the pelvic opening, and was protruding slightly. I put the mother's legs up in the stirrups and instructed her to push, hoping that she could deliver within a couple of minutes. We went through two contractions, two minutes apart, but the mother wasn't able to make any progress. Fetal heart tones continued to drop and we were all anxious.

At this point, I was faced with two options that both include significant risk. I could try to push the baby back through the pelvic outlet and into the uterus to perform a C-section, or I could use forceps to assist the mother to deliver vaginally. Both techniques are acceptable, but forceps delivery is more common in my training and experience. So, I elected to attempt vaginal delivery with forceps assistance, first. If the

mother still couldn't push the baby out with the assistance of minimal pulling on my part, then I would try to push the baby back up into the uterus. I applied the forceps and during the next contraction, Ms. Brooks pushed while I pulled, and Stephen was delivered.

Second Doctor's Testimony

Like Dr. Lee, I am a Board Certified obstetrician/gynecologist. I have frequently encountered medical situations similar to those presented by the labor of Ms. Brooks and the delivery of her son, Stephen.

Dr. Lee testified he examined Ms. Brooks at 2:10 a.m. following her admission to the emergency room. His records reflect adequate examination, and I concur with his determination of fetal distress requiring emergent delivery.

At that time, Ms. Brooks was determined by Dr. Lee and nursing personnel to be at minus one station. C-section is the appropriate route for delivery of a patient in Ms. Brook's condition. The last contemporaneous note indicates that Ms. Brooks was taken to the O.R. for emergent delivery via C-section. No records were kept of the events that occurred in the O.R. I understand that no extra labor and delivery personnel were available to perform charting while Dr. Lee, the circulating nurse, and scrub nurse prepped for the C-section.

I heard Dr. Lee's testimony and, specifically, his assertion that at the time of Foley insertion the nurse noted crowning and that his examination revealed the baby at plus two station. If this is true, his use of forceps to assist delivery would be appropriate. However, physician opinions must be based on reasonable medical probability. While anything is possible in medicine, it is my opinion, in reasonable medical probability, that this baby was not crowning. I believe the baby was still at minus one station, and, therefore, it was negligent of Dr. Lee to use forceps.

This was Ms. Brooks's first delivery. She had labored for two hours without making any substantial progress. She is noted by the nurses to have been tired. When the decision was made to perform a C-section, the patient was instructed to stop pushing. It is improbable, then, that in the next 15 minutes, without pushing, the baby descended into the birth canal to plus two station.

APPENDIX B**REI (RATIONAL EXPERIENTIAL INVENTORY) DISTRACTION TASK**

Please respond to each of the following statements using the 1-5 scale described below.

- 1 = Definitely NOT true of myself
- 2 = Not true of myself
- 3 = Somewhat true of myself
- 4 = True of myself
- 5 = Definitely true of myself

1. I try to avoid situations that require thinking in depth about something.
2. I like to rely on my intuitive impressions.
3. I'm not that good at figuring out complicated problems.
4. I don't have a very good sense of intuition.
5. I enjoy intellectual challenges.
6. Using my gut feelings usually works well for me in figuring out problems in my life.
7. I am not very good at solving problems that require careful logical analysis.
8. I believe in trusting my hunches.
9. I don't like to have to do a lot of thinking.
10. Intuition can be a useful way to solve problems.
11. I enjoy solving problems that require hard thinking.
12. I often go by my instincts when deciding on a course of action.
13. Thinking is not my idea of an enjoyable activity.
14. I trust my initial feelings about people.
15. I am not a very analytical thinker.

16. When it comes to trusting people, I can usually rely on my gut feelings.
17. Reasoning things out carefully is not one of my strong points.
18. If I were to rely on my gut feelings, I would often make mistakes.
19. I prefer complex problems to simple problems.
20. I don't like situations in which I have to rely on intuition.
21. Thinking hard and for a long time about something gives me little satisfaction.
22. I think there are times when one should rely on one's intuition.
23. I don't reason well under pressure.
24. I think it is foolish to make important decisions based on feelings.
25. I am much better at figuring things out logically than most people.
26. I don't think it is a good idea to rely on one's intuition for important decisions.
27. I have a logical mind.
28. I generally don't depend on my feelings to help me make decisions.
29. I enjoy thinking in abstract terms.
30. I hardly ever go wrong when I listen to my deepest gut feelings to find an answer.
31. I have no problem thinking things through carefully.
32. I would not want to depend on anyone who described himself or herself as intuitive.
33. Using logic usually works well for me in figuring out problems in my life.
34. My snap judgments are probably not as good as most people's.
35. Knowing the answer without having to figure out the reasoning behind it is good
enough for me.
36. I tend to use my heart as a guide for my actions.
37. I usually have clear, explainable reasons for my decisions.

38. I can usually feel when a person is right or wrong, even if I can't explain how I know.
39. Learning new ways to think would be very appealing to me.
40. I suspect my hunches are inaccurate as often as they are accurate.

APPENDIX C
DEMOGRAPHICS QUESTIONS

What is your country of birth? [Answer choices: US or other]

If you said 'other', what is your country of birth?

What is your mother's country of birth? [Answer choices: US or other]

If you said 'other', what is your mother's country of birth?

If you said 'other', how long has your mother been in the US?

What is your father's country of birth? [Answer choices: US or other]

If you said 'other', what is your father's country of birth?

If you said 'other', how long has your father been in the US?

What is your first, or native, language? [Answer choices: US English, other English, other]

If you said 'other English' or 'other', what is your first, or native, language?

If you said 'other English' or 'other', how many years have you spoken English?

What language do you speak at home?

If you said 'other English' or 'other', what language do you speak at home?

Age

Gender [Answer choices: M or F]

What is the highest level of schooling you have completed? [Answer choices: 1

(some elementary school), 2 (completed elementary school), 3 (some high school), 4 (high school degree), 5 (undergraduate degree), 6 (post-graduate degree)]

Current postal code

If you had to describe your racial background, how would you describe yourself?

Please indicate how strongly you identify with the racial background you just described.

[Answer choices: 1-Not strongly through 11-Very Strongly]

If you had to describe your nationality, how would you describe yourself?

Please indicate how strongly you identify with the nationality you just described.

[Answer choices: 1-Not strongly through 11-Very Strongly]

APPENDIX D**REPRESENTATIVE IAT SCREEN CAPTURES**

Thank you for participating today. If you use any corrective eyewear (for example, glasses or contact lenses) please put them on.

On the next few screens, you will read a series of statements that describe this project, and will have the opportunity to consent to participate further.

Press the SPACE BAR to begin.

RICE UNIVERSITY CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Principal Investigator: Dr. Andrew Perkins, Assistant Professor of Marketing, Jones School of Business, Rice University.

Description: The purpose of this study is to increase scholarly understanding of human perception and attention. By participating in this study, you will receive either class credit or a monetary payment.

Participating in this study should take less than 25 minutes.

Press the SPACE BAR to begin.

This study consists of two sections, plus some questions related to how you think about information and a demographics survey.

In Section 1, you will do a simple matching task. In this section, you will need to work as fast as you can while making as few mistakes as possible.

In Section 2, you will hear the testimony of physicians on opposite sides of a medical malpractice lawsuit. After listening to each doctor testify, you will answer a series of questions about the testimony you just heard.

Additionally, after hearing both doctors testify, you will answer one last series of question about your relative impressions of both doctors' testimony.

For Section 2, there are no right or wrong answers, and you will be able to work at your own pace. The relevant instructions will be restated at the beginning of each section.

Press the SPACE BAR to begin

Foreign

American

Put your middle or index fingers on the E and I keys of your keyboard. At the top of this and all subsequent screens in this section of the study, category headings appear. On this screen, they are 'Foreign' and 'American'.

Beginning on the next screen, audio sounds or written words will be presented to you, one at a time. The audio sounds will be presented to you through your headphones. The written words will appear in the middle of your computer screen.

When the audio sound or written word belongs to a category on the left, press the 'E' key, when it belongs to a category on the right, press the 'I' key. Items belong to only one category. If you make an error, an X will appear - fix the error by hitting the other (correct) key.

This is a timed sorting task. GO AS FAST AS YOU CAN while making as few mistakes as possible. Going too slow or making too many errors will result in an uninterpretable score. This task will take about 7 minutes to complete.

Press the SPACE BAR to begin.

Good

Bad

Now, the categories at the top of the screen have changed. The items for sorting have changed as well. The rules, however, are the same.

When the item belongs to a category on the left, press the 'E' key; when the item belongs to a category on the right, press the 'I' key. Items belong to only one category. An X appears after an error - fix the error by hitting the other key. GO AS FAST AS YOU CAN.

Press the SPACE BAR to begin

Good

Bad

Wonderful

Foreign

American

or

or

Good

Bad

Now, the four categories you previously saw separately are grouped together in pairs. This time, you will sort each audio sound or written word to the left or right if it belongs to either of the categories listed on that side. For example, for this screen, audio sounds associated with 'Foreign' and written words associated with 'Good' would go in one category, while audio sounds associated with 'American' and written words associated with 'Bad' would go in the other category.

The green and white labels and items may help to identify the appropriate category. As before, use the 'E' and 'I' keys to categorize the items to the left or right. Correct errors by hitting the other (correct) key GO AS FAST AS YOU CAN while making as few mistakes as possible.

Press the SPACE BAR to begin.

American

Foreign

Notice above, there are only two categories and they have switched positions. The concept that was previously on the left is now on the right, and the concept that was on the right is now on the left. Practice this new configuration.

Use the 'E' and 'I' keys to categorize items left and right, and correct errors by hitting the other key.

Press the SPACE BAR to begin.

American

or

Good

See above, the four categories now appear together in a new configuration. Remember, each item belongs to only one group.

The green and white labels and items may help to identify the appropriate category. Use the 'E' and 'I' keys to categorize items into the four groups left and right, and correct errors by hitting the other key.

Foreign

or

Bad

Press the SPACE BAR to begin.

American

or

Good

Foreign

or

Bad

Humiliate

Please respond to each of the following statements by clicking on the appropriate number below. PLEASE WORK AT YOUR OWN PACE.

I try to avoid situations that require thinking in depth about something.

Definitely NOT true of myself	Not true of myself	Somewhat true of myself	True of myself	Definitely true of myself
-------------------------------	--------------------	-------------------------	----------------	---------------------------

At times I think I am no good at all.

Not feeling this way at all	Feeling this way somewhat	Feeling this way very strongly
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You will now move on to Section 2. Please read all instructions carefully.

Imagine you are a juror in a medical malpractice trial. A doctor is being sued in connection with the way he delivered a baby.

One at a time, you will hear audio recordings of two different doctors state conflicting opinions about the baby's delivery. The testimony of both doctors relates to the methods used by the treating physician and the position of the baby in the mother's birth canal. Each recording is approximately 2 minutes long.

First, you will hear from the treating physician (the 'First Doctor') - the doctor who delivered the baby. Second, you will hear from another doctor (the 'Second Doctor'), who has a different opinion about what should have been done in this case, but who did not treat the patient.

After you've heard each doctor's testimony, you will be asked a series of questions about that testimony. In this section, there are no right or wrong answers, and you may work at your own pace.

Press the SPACE BAR to hear the testimony

Using the mouse or the number keys on your keyboard, please rate the doctor whose testimony you just heard in terms of:

Expertise



You will now listen to the doctor testifying for the other side in this dispute. Please pay careful attention to what the doctor says, as you will be asked about the testimony at a later time.

After the testimony is complete, you will move on to a number of questions about the testimony you just heard.

Press the SPACE BAR to hear the testimony.

Using the mouse or the number keys on your keyboard, please rate the doctor whose testimony you just heard in terms of:

Judgment



Based on the testimony you heard, which of the doctors would you side with in this dispute?



Please indicate on the scale below THE EXTENT TO WHICH you sided with one doctor versus the other.



Imagine you are an alternate juror on the panel in this case. You, therefore, do not participate in the final vote for a verdict, although you were present throughout the entire trial and heard all the evidence. You are excused from service while the jury panel deliberates. The decision is rendered in an average amount of time.

You are sitting in the courtroom when you hear the verdict. The verdict is in favor of the plaintiff (the patient), represented by the second doctor that you heard. The jury has found convincing and sufficient evidence of malpractice in this case.

How fair do you think this verdict is?



Imagine you are an alternate juror on the panel in this case. You, therefore, do not participate in the final vote for a verdict, although you were present throughout the entire trial and heard all the evidence. You are excused from service while the jury panel deliberates. The decision is rendered in an average amount of time.

You are sitting in the courtroom when you hear the verdict. The verdict is in favor of the defendant (the treating physician), represented by the first doctor that you heard. The jury has not found sufficient evidence of malpractice in this case.

How fair do you think this verdict is?



Please answer the following questions.

3). What is your country of birth?

Next

Please answer the following questions.

4). What is your first, or native, language?

Next

Please answer the following questions.

5). If you said 'other', what is your first, or native, language?

6). If you said 'other', how many years have you spoken English?

Please answer the following questions.

8). Age

9). Gender

10). What is the highest level of schooling that you have COMPLETED?

11). Current Post/af Code

Please answer the following questions.

12). If you had to describe your racial background, how would you describe yourself?

American

13). Please indicate how strongly you identify with the racial background you just described:

3

14). If you had to describe your nationality, how would you describe it?

Canadian

15). Please indicate how strongly you identify with your nationality:

1 = Not Strongly
2
3
4
5
6
7
8
9
10 = Very Strongly

Finish