The effect of sociolinguistic accent on the believability of trivia statements

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Abstract

This study sought to investigate the effect of British Received Pronunciation and Southern U.S. accents on the perceived credibility of speakers. I used a within-subjects, matched-guise design, with two male and two female speakers who read trivia statements in British and Southern accents. Participants listened to 48 statements and rated them on perceived veracity. I hypothesized that listeners would rate statements read in British as more true than statements read in a Southern accent, based on accent stereotypes. Surprisingly, there were no significant differences between the perceived veracity ratings of British- and Southern-accented speech. Experiment 2 used a between-subjects design. Again, I found no significant results, which suggests that stereotypes may not affect the perceived credibility of British- and Southern-accented speakers, in a sample of General American English listeners. The results are consistent with the hypothesis that processing fluency does play a role in the perceived credibility of speakers because British and Southern speakers were rated similarly by General American speakers.

Keywords: accent perception, stereotypes, processing fluency, native vs. foreign accents, language attitudes

Language is a tool humans use to communicate ideas, thoughts, and information to one another. Since every person who uses spoken language has an accent, it follows that information uttered by an individual will be colored by his or her accent. Decades of research in sociolinguistics and social psychology have shown that a speaker's accent affects how he or she is perceived by a listener. The widely accepted explanation for this phenomenon remains that accents elicit a stereotype that listeners then project onto the speaker. However, more recent research has demonstrated that stereotypes may not be at play; Rather, some researchers argue that processing fluency, the ease with which accented speech is processed in a listener's brain, influences how a speaker is perceived.

Stereotypes

Early sociolinguistic research has shown that a listener takes into account several social variables relating to a speaker's accent, including age, sex, social class, and geographic location (Giles, 1970). This research demonstrates that speech relays more than just phonetic information to a listener. Rather, it also conveys information that reflects a person's identity. Because accents are more or less markers of social status, they, consequently, vary in levels of prestige. Individuals high on the social hierarchy will have accents of high prestige, and, conversely, individuals with low social status will have accents with low prestige. Because of the correlation between accent and social class status, accents indirectly convey social information to the listener. A consequence of this is that listeners may stereotype, prejudge, or make assumptions about an individual based on accent alone. For example, a listener may hear a person speaking with an accent low in prestige and subsequently make judgments about that speaker based on the association between his or her accent and the social information encoded in the accent.

Other sociolinguistic research has shown that group membership stereotypes affect how a speaker's language is perceived (Thakerar & Giles, 1981). In one study, research on perception[1] and social information found that social information does influence listeners' perceptions of speakers (Niedzielski, 1999). Participants from the Detroit area listened to recordings of vowels and were asked to indicate which ones best matched those of Detroit area residents. For half of the vowels, participants were misled to believe that they were recorded by a Canadian speaker, when in fact all had been recorded by a native Detroiter. When told the speaker was Canadian, participants chose vowels indicative of the Canadian Raising. But when told the speaker was from the Detroit area, participants did not choose those vowels. Since the speaker for all vowels was from the Detroit area, the piece of social information provided to the listeners—the geographic label of the speaker—affected their judgments.

Geographic region is often times associated with type of accent. In other words, there is a strong connection between an individual's accent and where he or she is from, because this information is encoded in the accent that listeners can reliably identify (Clopper & Pisoni, 2004). Standard varieties of a language are often perceived as more prestigious than nonstandard varieties. Speakers of standard varieties of English, for example, are perceived as more intelligent, educated, and credible than speakers of nonstandard varieties of English. Regional-accented speakers are evaluated as more criminal than speakers of standard-accented speech (Dixon & Mahoney, 2004). When asked to rate suspects in terms of guiltiness, participants in one study rated the suspect with a nonstandard Birmingham accent as guiltier than the suspect with a standard British Received Pronunciation accent (Dixon, Mahoney, & Cocks, 2002). Several nonstandard varieties of English in the United States are particularly stigmatized, especially those that comprise the category of Southern English. People with Southern accents

are generally perceived as funny and unintelligent, and characters in the media perpetuate this stereotype (Heaton & Nygaard, 2011). As a result, speakers with these accents are perceived negatively in a social light (Luhman, 1990).

Processing fluency

Processing fluency has been shown to affect judgments people make in various contexts (Oppenheimer, 2008). For example, if a set of exercise routine instructions is more difficult to read, participants perceive the exercise as taking longer and being more difficult to complete (Song & Schwarz, 2008). In that study, processing fluency also affected how willing a participant was to take part in the exercise. Those who received the instructions in an easier-to-read font reported being more likely to engage in the exercise than those who received the same instructions in a difficult-to-read font. In another study, researchers found that if a statement is easier to read and, therefore, easier to process, participants rate that statement as more true (Reber & Schwarz, 1999). Furthermore, one robust finding in the literature is called the *truth effect*, whereby participants rate statements they have previously read as more true than statements they have not previously seen, because the repetition of the stimulus allows for more processing fluency (Dechêne, Stahl, Hansen, & Wänke, 2010).

Research in psychology has shown the impact of processing fluency on the perceived credibility of speakers. In one study, researchers tested whether a speaker's non-native accent affects how credible he or she is perceived by listeners (Lev-Ari & Keysar, 2010). For example, would trivia statements read by a speaker with a Turkish accent be rated as less true than if read by a native English speaker? Foreign-accented speech was rated as less true than native-accented speech, which the authors attributed not to stereotypes, but to processing fluency. They reasoned that because native English speakers have trouble understanding foreign-accented speech, these

speakers would misinterpret this difficulty in comprehension as incredibility. Furthermore, other research on native and foreign accents has shown that non-native speech is processed in less detail than native speech (Lev-Ari & Keysar, 2012), which may be one reason why people with non-native accents are perceived as less credible than those with native accents. Additionally, when participants focus on aspects of non-native speech that render said speech difficult to understand, subsequent ratings on judgments of truth are negatively affected (Souza, 2012).

The current study

If non-native accents affect the credibility of a speaker, does this effect generalize to native accents? The aim of the current study was to investigate whether a native English speaker's accent would affect his or her credibility when judged by fellow native English speakers. To test this question, I used a paradigm similar to that of Lev-Ari and Keysar (2010), but with modifications. In my paradigm, participants listened to several trivia statements read in the three different English accents and subsequently rated the statements on perceived veracity. Since this current study was looking at native accents of English, I decided to use the following three accents: British Received Pronunciation, Southern U.S. English, and General American English. This paradigm was used because other studies have found success with such method (e.g., Lev-Ari & Keysar, 2010; Unkelbach, 2007). Additionally, in one study in cognitive neuroscience that used event-related potentials, participants used social stereotypes about a speaker's identity to predict what that speaker would say (Van Berkum et al., 2008). For example, if a person with a lower-class accent utters, *In my garage I have a Jaguar with leather upholstery*, listeners show activation in the N400 region, which is the region indicative of semantic anomalies. This study suggests that listeners use information from a speaker's voice to make judgments about the speaker very rapidly, sometimes within 200-300 milliseconds of

hearing the speaker's voice. Not only does this study show that listeners take into account attributes of a speaker's voice to make social judgments about the speaker, but it also shows that this occurs before an entire sentence's meaning is processed by the listener. Therefore, I believed trivia statements would be sufficient to investigate the effect I was looking for.

For this study, I had two separate hypotheses, analogous to the two lines of theoretical research discussed above. The first hypothesis was that stereotypes elicited by the accent of speakers would influence the way in which trivia statements read in these accents were rated with regard to veracity. Since British is perceived as higher class and enjoying higher social status (evidence for this will be provided in the *Norming Study* section), I hypothesized that trivia statements read in this accent would be rated as more true than the statements in both the Southern and General American accents. Because General American is considered more prestigious than Southern, but less so than British (evidence for this will be provided in the *Norming Study* section), I hypothesized that trivia statements read in the General American accent would be rated as more true than Southern, but less so than the British accent. Half of the trivia statements were considered easy (*An apple is a fruit*), and the other half were considered difficult (*The Canadian side of Niagara Falls is higher than the American side*). (For a full list of trivia statements, please see Appendix A.) I implemented this paradigm under the following hypotheses: (1) For the easy questions, the speaker's accent will not influence the veracity ratings of the trivia statements because participants will use their previous knowledge to answer the questions. (2) For the difficult questions, participants cannot use their knowledge to answer the questions because of the level of difficulty; Therefore, they will unconsciously use the accent of the speaker to aid in their ratings of perceived veracity.

The second hypothesis was that processing fluency would mediate the perceived credibility of a speaker. That is, accents that were more difficult to understand would be perceived as less credible, and accents that were processed more easily by the listeners would be rated as more credible. Since I was testing native accents, and listeners were native speakers of General American English, I hypothesized that listeners would rate trivia statements read in the General American accent as more true than either the British accent or Southern accent. This is because speakers of General American English are more familiar with the General American accent and, thus, process more fluently speech read in this accent. Conversely, since native General American English speakers are less familiar with the British and Southern accents, they would have more difficulty processing speech in both of these accents.

I divided this project into several sections. First, I conducted a norming study to (1) gather data on attitudes toward the accents in this study, (2) test whether these accents elicit stereotypes in participants, (3) verify that the voice actors produced reliable and accurate accents. Second, Experiment 1 tested whether or not native English accents influence the perceived credibility of speakers. Third, Experiment 2 was a stepwise follow-up study that used a different design to validate the results from Experiment 1.

Norming study

Method

Participants. Thirty-one University of Michigan undergraduate psychology students participated in this study for course credit. One participant was dropped for non-participation, decreasing the total number of participants to 30. Twenty participants were female (66.67%), and participants ranged in age from 17 to 24 (M = 18.63, SD = 1.19). The participants, with the exception of two, were native speakers of American English.

Materials and design. Four voice actors (two male and two female) from the University of Michigan School of Music, Theatre, & Dance each recorded 48 trivia statements in three different accents (General American, British, and Southern). Each actor was monetarily compensated for his or her work. The trivia statements were categorized into statements that were *Easy-True* (e.g., *There are fifty states in the United States)*, *Easy-False* (e.g., *Texas shares a border with Canada*), *Difficult-True* (e.g., *Uzbekistan is doubly landlocked*), and *Difficult-False* (e.g., *Bees have seven eyes*). (Please see Appendix A for a full list of the trivia statements.) The statements were either borrowed from Unkelbach (2007) or created by me using an encyclopedia.

I used a within-subjects matched-guise design, whereby each participant listened to four recordings from every guise and subsequently filled out various rating scales relating to the guise they had just heard. Participants were asked to rate the speaker from each guise in terms of friendliness, authoritativeness, competency, etc. on a scale with poles from (1) *not at all* [attribute] to (7) *very* [attribute]. Additionally, participants were asked what role they envisioned the speaker playing in a film, which geographic location they thought the speaker was from, and how difficult they thought the speaker's accent was to understand.

Procedure. The study was administered to participants through Qualtrics via the online subject pool system (SONA) at the University of Michigan. Participants were told that the purpose of the study was to gather information about language attitudes and were asked to sit in a quiet area with no distractions for the duration of the study. Participants were instructed to listen to the four recordings for each guise by pressing the *play* button and were also told that they could replay the recordings as needed.

A significant portion of the task was, first, for participants to listen to sample recordings and rate each guise in terms of several categories, such as intelligence, competency, and clarity. This part of the study gathered data on attitudes toward accents. Second, participants were asked to name a role they would envision the speaker in the guise playing in a film. Third, participants rated how difficult each guise was to understand (0 to 100). Next, I asked where participants thought the speaker was from based on accent. Finally, I had participants listen to a recording and type verbatim the sentence they heard. This last task was a clarity check to ensure participants could understand each speaker.

After participants finished the Qualtrics survey, the results were submitted, and participants received credit for participation. After data collection was completed, the data were exported to Excel and SPSS for analysis.

Results and discussion

The results of the norming study were well in line with what would be expected if accented speech elicited stereotypes. Participants were asked to rate the accents in terms of intelligence, authoritativeness, attractiveness, and competency. A two-way repeated-measures Analysis of Variance (ANOVA), with accent as the dependent measure and the four aforementioned attributes as independent measures, showed that there was an effect of accent on the perceived intelligence ($F(1, 29) = 83.22$, $p < .001$), authoritativeness ($F(1, 29) = 44.27$, $p < .001$), attractiveness ($F(1, 29) = 46.62$, $p < .001$), and competency ($F(1, 29) = 60.49$, $p < .001$) of speakers. Participants rated the British accent as more intelligent than both the General American ($t(29) = 4.59$, $p < .001$) and Southern ($t(29) = 9.88$, $p < .001$) accents. Participants rated the General American accent as more intelligent than the Southern ($t(29) = 8.98$, $p < .001$). British was perceived as more authoritative than both the General American ($t(29) = 5.69$, $p < .001$) and

Southern ($t(29) = 7.96$, $p < .001$) accents, and General American was perceived as more authoritative than Southern ($t(29) = 4.99$, $p < .001$). In terms of attractiveness, participants rated British as more attractive than Southern ($t(29) = 8.17$, $p < .001$), and General American was rated as more attractive than Southern ($t(29) = 7.63$, $p < .001$). However, there was no significant difference between British and General American ($t(29) = 1.53$, $p = .137$). As far as competency ratings, British was perceived as more competent than both Southern ($t(29) = 7.87$, $p < .001$) and General American ($t(29) = 2.56$, $p = .016$). Furthermore, competency ratings for General American were higher than those for Southern ($t(29) = 8.63$, $p < .001$). (Please see *Figure 1* for all attribute rating means.) The results of these attribute ratings suggest that participants perceived British as the most prestigious and highly regarded of the three accents, with General American in the middle and Southern as the least.

In order to gauge processing fluency, I asked participants to rate the accents in terms of clarity, familiarity, foreignness, and similarity to one's own accent. A two-way repeated-measures ANOVA, with accent as the dependent measure and the four aforementioned attributes as independent measures, showed that there was an effect of accent on perceived clarity ($F(1, 29) = 48.75$, $p < .001$), familiarity ($F(1, 29) = 32.28$, $p < .001$), foreignness ($F(1, 29) = 90.48$, $p < .001$), and similarity ($F(1, 29) = 173.8$, $p < .001$). As expected, in terms of clarity, the General American accent was rated as clearer than both British ($t(29) = 8.93$, $p < .001$) and Southern ($t(29) = 2.82$, $p = .009$). British was perceived as clearer than Southern ($t(29) = 6.43$, $p < .001$). For familiarity, General American was rated as more familiar than both Southern ($t(29) = 6.56$, $p < .001$) and British ($t(29) = 6.76$, $p < .001$). There was no difference in familiarity ratings between Southern and British ($t(29) = .75$, $p = .46$). Regarding similarity, participants rated General American as more similar to their own accent than both Southern ($t(29) = 14.34$, $p <$

.001) and British ($t(29) = 14.24$, $p < .001$). There was no difference in perceived similarity ratings between the Southern and British accents ($t(29) = .48$, $p = .64$). In terms of foreignness, British was rated as more foreign than both Southern ($t(29) = 6.95$, $p < .001$) and General American ($t(29) = 13.55$, $p < .001$). Additionally, Southern was perceived as more foreign than General American ($t(29) = 6.43$, $p < .001$). (Please see *Figure 1* for all attribute rating means.) The patterns observed for these four measures of processing fluency are in line with what I would expect from participants who were native speakers of American English. Because they are used to hearing American English in their daily lives, they are able to process the General American accent more easily, resulting in their ratings of General American as clearest and most familiar and similar.

After the ratings portion of the study, I also asked participants what role they would envision an actor with each of the accents playing in a film. For the General American accent, participants chose roles that were very neutral, average, and general (e.g., *main character*, *anything*, *friend*, *student*, *businessperson*, *reporter*, *teacher*, *father/mother*, *average Joe*, *normal person*). For the Southern accent, participants chose very stereotypical roles (e.g., *farmer*, *cowboy/girl*, *rural worker*, *Hillbilly*, *hairdresser*, *unintelligent person*, *reverend*, *Western role*, *redneck*, *waitress*, *politician*, *Southern wife*). For the British accent, participants again chose roles that fit certain stereotypes (e.g., *smart person*, *doctor*, *scientist*, *professor*, *lawyer*, *reporter*, *businessperson*, *spy*, *rich person*). This task produced informative results because it allowed me to get an insight into which stereotypes are activated when a listeners hears speech in each of the three accents.

In order to verify that the voice actors produced accents that were representative of the regions in the U.S. and England that the study was interested in, I asked participants to state

where they thought each speaker was from. The results show that the speakers' accents were very reliable. The vast majority of our participants placed the General American accent as somewhere either on the East Coast (e.g., New York, Washington, D.C.), in the Midwest (e.g., Michigan, Indiana), or on the West Coast (e.g., California, of the United States. Participants thought speakers with the Southern accents were from the South (e.g., Texas, Georgia, Alabama), and they reliably recognized that speakers with the British accent were from the U.K./England/Britain (e.g., London, Wales). I also asked participants to listen to statements read in each of the guises to make certain that the speakers were clearly understandable. This effect was also very reliable. Nearly every participant typed the exact phrase that was spoken in the recording.

The norming study produced results that were clearly in line with past research and, therefore, exactly what I was expecting to see. It appears that accents themselves do elicit stereotypes when heard by a listener. I can be confident with this assertion because of my study design. I used a matched-guise, which means that because each voice actor produced recordings in three different accents, potential confounding variables were removed. These include variables relating to aspects of speech other than accent, such as prosody, cadence, intonation, rhythm, and speed. Given that the results from the norming study were what I expected, I decided it was justified to move forward to Experiment 1, which tested whether or not native English accents influence the perceived credibility of a speaker.

Experiment 1

Method

Participants. Sixty native speakers of American English were recruited through Amazon's Mechanical Turk (mTurk) website to participate in this study. Twenty were female

(33.33%). 13.33% of participants reported being 17-years-old or younger; 70% were between the age of 25 and 44; 16.67% were between 45 and 64. In order to conceal the true purpose of the study, participants were told that I was administering a study on trivia statements.

Materials and design. The trivia statements used in Experiment 1 were the same ones used in the norming study. Four voice actors (two male and two female) recorded 48 trivia statements in three different accents (General American, British, and Southern). However, this experiment only compared the British and Southern accents. The trivia statements were categorized into statements that were *Easy-True*, *Easy-False*, *Difficult-True*, and *Difficult-False*. While the norming study only used a sample of recordings, Experiment 1 used all 48 trivia statements. I used a within-subjects, matched-guise design in which there were 48 items, 12 in each primary condition. Within each condition, participants heard three sentences from each of the four speakers and six sentences in each of the two guises. However, no participant heard both guises from a single speaker. Therefore, there were eight (speaker × guise) conditions in all, but each listener was only exposed to four of them. For each of the 48 trials, participants listened to a trivia statement and then rated how true or false they thought it was, on a sliding scale from 0 to 100 (*definitely false* - *definitely true*). The higher the number, the more true they perceived the statement. After all the trials were completed, participants filled out demographic information.

Procedure. The study was administered to participants through Qualtrics via Amazon's Mechanical Turk (mTurk). After participants acknowledged that they were native speakers of American English and agreed to participate in the study, they opened the link that took them to the Qualtrics survey. Each participant first listened to all 48 trivia statements and filled out the rating scales. After the main part of the study was completed, I had participants fill out end-of-study information, including what they thought the study was about. I also collected data on

similarity ratings. That is, participants were asked to listen to several sample recordings from each of the guises and rate how similar they perceived their own voice to be to the speaker in the guise. After all data were collected in the study, participants were thanked and monetarily compensated for their time and effort.

Results

My original hypothesis was that if stereotypes influenced the perceived credibility of speakers, then participants would rate trivia statements read in the British accent as more true, than statements read in the Southern accent. My second hypothesis was that if processing fluency influenced the perceived credibility of speakers, then participants would rate trivia statements read in the British and Southern accents similarly.

However, the results did not support either of these hypotheses. Subject means were computed for the following cells of the experiment design: British *Easy-True*, *Easy-False*, *Difficult-True*, *Difficult-False* and Southern *Easy-True*, *Easy-False*, *Difficult-True*, *Difficult-False*. For the analysis, the factual truth of the statements was ignored because the false items were reverse coded. The false statements were reverse coded for simplicity, so that a higher rating would indicate higher perceived veracity. The subject means were submitted to a 2(difficulty) x 2(accent) two-way repeated-measures ANOVA, which showed a significant effect of difficulty ($F(1, 51) = 420.2$, $p < .001$). However, there was no significant effect of accent ($F(1, 51) = 1.33$, $p = .26$) or an interaction between accent and difficulty ($F(1, 51) = .44$, $p = .51$) on the believability of trivia statements. In the study design, I used both male and female speakers. In order to verify gender did not affect the believability of trivia statements, I performed a 2(accent) x 2(gender) two-way repeated-measures ANOVA, which found that there

was no effect of speaker gender on believability ($F(1, 51) = .57$, $p = .46$). (Please see *Figure 2* and *Figure 3* for accent and gender mean ratings respectfully.)

Discussion

Because I used a within-subjects design, there was the possibility that participants guessing the study hypothesis could have skewed the results. Therefore, I grouped the data based on whether participants guessed or did not guess the study hypothesis as indicated by their end-of-survey responses. After analyzing the data based on these two groups, I found no significant differences in mean truth ratings of the trivia statements based on accent.

Although I did not find any significant results in my analyses, there were trends in the group that did not guess the study hypothesis that showed that accent might affect the believability of trivia statements. That is, statements read in the British accent were rated as slightly more true than statements read in the Southern accent. For this reason, I thought that the within-subjects study design was the cause of the null effect. Therefore, Experiment 2 was designed to test whether a between-subjects design would produce results such that accent would affect the believability of trivia statements.

Experiment 2

Method

Participants. Forty-five native speakers of American English were recruited through Amazon's Mechanical Turk (mTurk) website to participate in this study. Twenty-one were female (46.67%). Self-reported data showed that 20% of participants were between the ages of 18 and 24, 51.11% were between 25 and 34, 20% were between 35 and 44, and 8.89% were between 45 and 64. To conceal the true purpose of the study, participants were told that I was administering a study on trivia statements.

Materials and design. The 48 trivia statements used in Experiment 2 were the same that were used in both the norming study and Experiment 1. However, I used three guises from only one of the male speakers (General American, Southern, and British). The trivia statements were categorized into statements that were *Easy-True*, *Easy-False*, *Difficult-True*, and *Difficult-False*. I used a between-subjects matched-guise design, and the statements within each condition were randomly presented to the participants. Every participant completed 48 trials. For each, participants listened to a trivia statement and then rated how true or false they thought it was, on a sliding scale from 0 to 100 (*definitely false* - *definitely true*). The higher the number, the more true they perceived the statement. After all the trials were completed, participants filled out demographic information.

Procedure. The study was administered through Qualtrics via mTurk. Participants acknowledged that they were native speakers of American English and clicked a link that opened the Qualtrics survey. Participants listened to 48 trivia statements in one of the three accents and filled out rating scales. After this portion of the study, I asked participants' demographic information and end-of-study questions, such as what they thought the purpose of the study was. After all data were collected in the study, participants were thanked and monetarily compensated for their time and effort. After data collection was finished, the data were exported to SPSS for analysis.

Results and discussion

In Experiment 2, I sought to disambiguate whether or not the within-subjects experimental design in Experiment 1 was the cause of my null results. Subject means were computed for the following cells of the experiment design: General American *Easy-True*, *Easy-False*, *Difficult-True*, *Difficult-False*; Southern *Easy-True*, *Easy-False*, *Difficult-True*, *Difficult-*

False; and British *Easy-True*, *Easy-False*, *Difficult-True*, *Difficult-False*. For the analysis, the factual truth of the statements was ignored because the false questions were reverse coded. The false statements were reverse coded for simplicity, so that a higher rating would indicate higher perceived veracity. The subject means were submitted to a 3(accent) x 2(difficulty) x 2(veracity) one-way ANOVA, which showed a significant effect of difficulty ($F(1, 42) = 2125.42$, $p < .001$) and an interaction between difficulty and veracity ($F(1, 42) = 4.57$, $p < .05$). However, there was no significant effect of accent on truth ratings of trivia statements ($F(2, 42) = 1.55$, $p = .22$). (Please see *Figure 4* for mean accent ratings.) I expected that the within-subjects design used in Experiment 1 caused the null findings in that study. However, with null results in Experiment 2, using a between-subjects design, I concluded that the experimental design was not the cause of the non-significant findings.

General discussion

This project sought to answer whether native accents of English (General American, Southern, and British) affect the perceived credibility of a speaker with native listeners. Two hypotheses guided this research. One hypothesis was that accented speech would elicit social stereotypes that listeners would then project onto the speaker. The stereotype projection would then either positively or negatively influence the speaker's perceived credibility. The second hypothesis was that processing fluency would mediate the perceived veracity of trivia statements depending on accent type. That is, trivia statements read in accents that are easier to understand would be rated as more true than those read in accents difficult to understand.

The main purpose of the norming study was to measure individuals' attitudes and perceptions toward the three native English accents used in this project: General American, Southern, and British. Because one of my hypotheses was that elicited stereotypes would

mediate perceived veracity of trivia statements, the norming study also sought to gather whether accented speech elicits social stereotypes of speakers. I concluded that listening to accented speech does activate stereotypes of the speaker. Participants thought speakers of British were most intelligent, authoritative, and attractive, followed by speakers of General American, and then those of Southern. When asked to name a role in film that a British speaker would play, participants identified stereotypical prestigious and commanding roles, such as *smart person*, *scientist*, *businessman*, *rich person*. Speakers of General American were given neutral roles, like *main character*, *anything*, *average Joe*, *normal person*. Lastly, participants thought speakers of Southern would play roles like *farmer*, *cowboy/girl*, *rural worker*, *unintelligent person*. Additionally, participants correctly matched each accent with its geographic location. Because participants drew conclusions about perceived qualities, hypothetical film role, and geographic location all from simply listening to speakers of each accent, I can conclude that accents carry different levels of social information that listeners use to project onto speakers.

Experiment 1 looked at whether accent influenced the perceived veracity of statements. Participants listened to trivia statements in accented speech and rated how true or false they thought each statement was. I found no effect of accent on the perceived veracity of trivia statements. Because I used a within-subjects design for Experiment 1, approximately half of the participants guessed the study hypothesis. This led me to believe the experimental design was the cause of the null results. In order to resolve this issue, I conducted Experiment 2, which was a stepwise between-subjects retrial of Experiment 1. Again, I found no effect of accent on the perceived veracity of trivia statements.

There are three identifiable hypotheses that may explain why I did not find an effect of native English accents on the perceived credibility of speakers. This study was largely modeled

after Lev-Ari and Keysar (2010), which used a similar trivia statement paradigm to measure the perceived credibility of native versus foreign speakers. In that study, the researchers found that participants rated foreign-accented speech as less credible than native-accented speech. One possibility is that this effect is only true for native versus foreign accents and, thus, does not generalize when comparing native accents, such as General American vs. British vs. Southern. Initially, it may appear that British should be considered a foreign accent relative to native American English speakers. However, it could be argued that British is a native accent for American English speakers. If "English" is the umbrella term for the language as a whole, then all varieties of English, regardless of their geographic location in the world, include native accents for all native English speakers. More so, there is no inherent reason why British is not spoken somewhere in the United States. It might as well be another variety of English, just as General American and Southern are.

Another possibility for the null results is that the foreign versus native accent processing fluency effect—which was suggested in Lev-Ari and Keysar (2010) and on which my study was based—does not exist. In one study, Souza and Markman (2013) attempted to replicate those findings. Because Lev-Ari and Keysar (2010) proposed that processing fluency, not stereotypes, affects the perceived credibility of foreign-accented speakers, the replication study used multiple manipulations of processing fluency to test this claim. In one part of the experiment, the researchers added white noise and speech babbling over recorded trivia statements. If processing fluency and not foreign accent were the cause of the lowered credibility ratings for foreign-accented speech, then trivia statements with added noise should be rated as less true than statements without the noise. However, no such effect was found; There was no significant difference in ratings between statements with noise and statements without.

In another part of the study, Souza and Markman (2013) attempted to directly replicate the findings from Lev-Ari and Keysar (2010). However, they found that trivia statements recorded in foreign-accented speech were not rated significantly different from statements recorded in native-accented speech. That is, the study failed to find a foreign versus native effect on the perceived credibility of a speaker. Taken together, it appears that processing fluency does not affect perceived credibility, and there is not a foreign-accent effect. A likely possibility is that the finding from Lev-Ari and Keysar (2010) is a false positive. Thus, if a native versus foreign accent effect does not exist, then it would be logical to reason that an attempt to generalize this effect to native versus native accents—the basis for the current study—would be carried out to no avail.

A third possibility for my findings is that stereotypes and/or processing fluency do affect the credibility of speakers, but the paradigm I employed was too explicit of a measure. That is, asking participants to listen to trivia statements read in accented speech and then rate how true or false they believe the sentences are too directly attempts to measure perceived credibility with a lens too far zoomed in. Future studies looking at the role of stereotypes with regard to the perceived credibility of a speaker may want to employ a more implicit measure to test for this effect. For example, a study may want to have participants listen to a short accented audio clip in which the speaker gives some sort of advice. Participants would then have to rate how sound they believe the advice is and how likely they would be to follow this advice. A study that employs a paradigm such as this may better capture the degree to which stereotypes elicited by accented speech affect listener judgments.

The current study reported mostly null results; Therefore, the extent to which stereotypes and processing fluency play a role in the perceived credibility of a speaker is still unclear. With

the literature in this area of research currently divided, one motivation of this study was to attempt to disambiguate whether stereotypes or processing fluency affect the perceived credibility of a speaker. However, with null results across all of my hypotheses, this study did not find what it initially attempted to. Therefore, more research in this area needs to be conducted. With regard to future studies, I would like to see a focus on and further explore the role of processing fluency in the perceived credibility of speakers. Subsequent studies will likely explore the idea of using eye tracking or go/no go paradigms to measure reaction times. In these types of studies, longer reaction time would translate to slower processing, and shorter reaction time would indicate faster processing. Using these types of experimental designs will be important in order to test processing fluency in a paradigm different from the trivia statement design employed in Lev-Ari and Keysar (2010), Souza and Markman (2013), and the current study.

References

Clopper, C. & Pisoni, D. (2004). Some acoustic cues for the perceptual categorization of American English regional dialects. *Journal of Phonetics*, *32*(1), 111-140. doi: 10.1016/S0095-4470(03)00009-3

Dechêne, A., Stahl, C., Hansen, J., & Wänke, M. (2010). The truth about the truth: A meta-analytic review of the truth effect. *Personality and Social Psychology Review*, *14*(2), 238-257. doi: 10.1177/1088868309352251

Dixon, J., Mahoney, B., & Cocks, R. (2002). Accents of guilt? Effects of regional accent, race, and crime type on attributions of guilt. *Journal of Language and Social Psychology*, *21*(2), 162-168. doi: 10.1177/02627X02021002004

Giles, H. (1970). Evaluative reactions to accents. *Educational Review*, *22*(3), 211. doi: 10.1080/0013191700220301

Heaton, H. & Nygaard, L. (2011). Charm or harm: Effect of passage content on listener attitudes toward American English accents. *Journal of Language and Social Psychology*, *30*(2), 202-211. doi: 10.1177/0261927X10397288

Lev-Ari, S. & Keysar, B. (2010). Why don't we believe non-native speakers? The influence of accent on credibility. *Journal of Experimental Social Psychology*, *46*(6), 1093-1096. doi: 10.1016/j.jesp.2010.05.025

Lev-Ari, S. & Keysar, B. (2012). Less-detailed representation of non-native language: Why non-native speakers' stories seem more vague. *Discourse Processes*, *49*(7), 523-538. doi: 10.1080/0163853X.2012.698493

Luhman, R. (1990). Appalachian English stereotypes: Language attitudes in Kentucky. *Language in Society*, *19*(3), 331-348. doi: 10.1017/S0047404500014548

Mahoney, B. & Dixon, J. (2004). The effect of accent evaluation and evidence on a suspect's perceived guilt and criminality. *The Journal of Social Psychology*, *144*(1), 63-73. doi: 10.3200/SOCP.144.1.63-73

Niedzielski, N. (1999). The effect of social information on the perception of sociolinguistic variables. *Journal of Language and Social Psychology*, *18*(1), 62-85. doi: 10.1177/0261927X99018001005

Oppenheimer, D. (2008). The secret life of fluency. *Trends in Cognitive Science*, *12*(6), 237-241. doi: 10.1016/j.tics.2008.02.014

Reber, R. & Schwarz, N. (1999). Effects of perceptual fluency on judgments of truth. *Consciousness and Cognition*, *8*(3), 338-342. doi: 10.1006/ccog.1999.0386

Song, H. & Schwarz, N. (2008). If it's hard to read, it's hard to do: Processing fluency affects effort prediction and motivation. *Psychological Science*, *19*(10), 986-988. doi: 10.1111/j.1467-9280.2008.02189.x

Souza, A. (2012). *Modality-specific effects of processing fluency on cognitive judgments*. (Doctoral dissertation). Retrieved from University of Texas Electronic Theses and Dissertations. (Identifier No. 2152/ETD-UT-2012-05-5235)

Souza, A. & Markman, A. (2013). Foreign accent does not influence cognitive judgments. *CogSci 2013: The annual meeting of the cognitive science society*, *Berlin, Germany*.

Thakerar, J. & Giles, H. (1981). They are—So they spoke: Non-content speech stereotypes. *Language & Communication*, *1*(2-3), 255-261. doi: 10.1016/0271-5309(81)90015-X

Unkelbach, C. (2007). Reversing the truth effect: Learning the interpretation of processing fluency in judgments of truth. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *33*(1), 219-230. doi: 10.1037/0278-7393.33.1.219

Van Berkum, J., van den Brink, D., Tesink, C., Kos, M., & Hagoort, P. (2008). The neural integration of speaker and message. *Journal of Cognitive Neuroscience*, *20*(4), 580-591. doi: 10.1162/jocn.2008.20054

Footnotes

[1]In sociolinguistics, *perception* refers to a judgment, whereas in cognitive psychology, *perception* refers to processing and interpreting a stimulus. The use of *perception* in this paper refers to judgments.

Figures

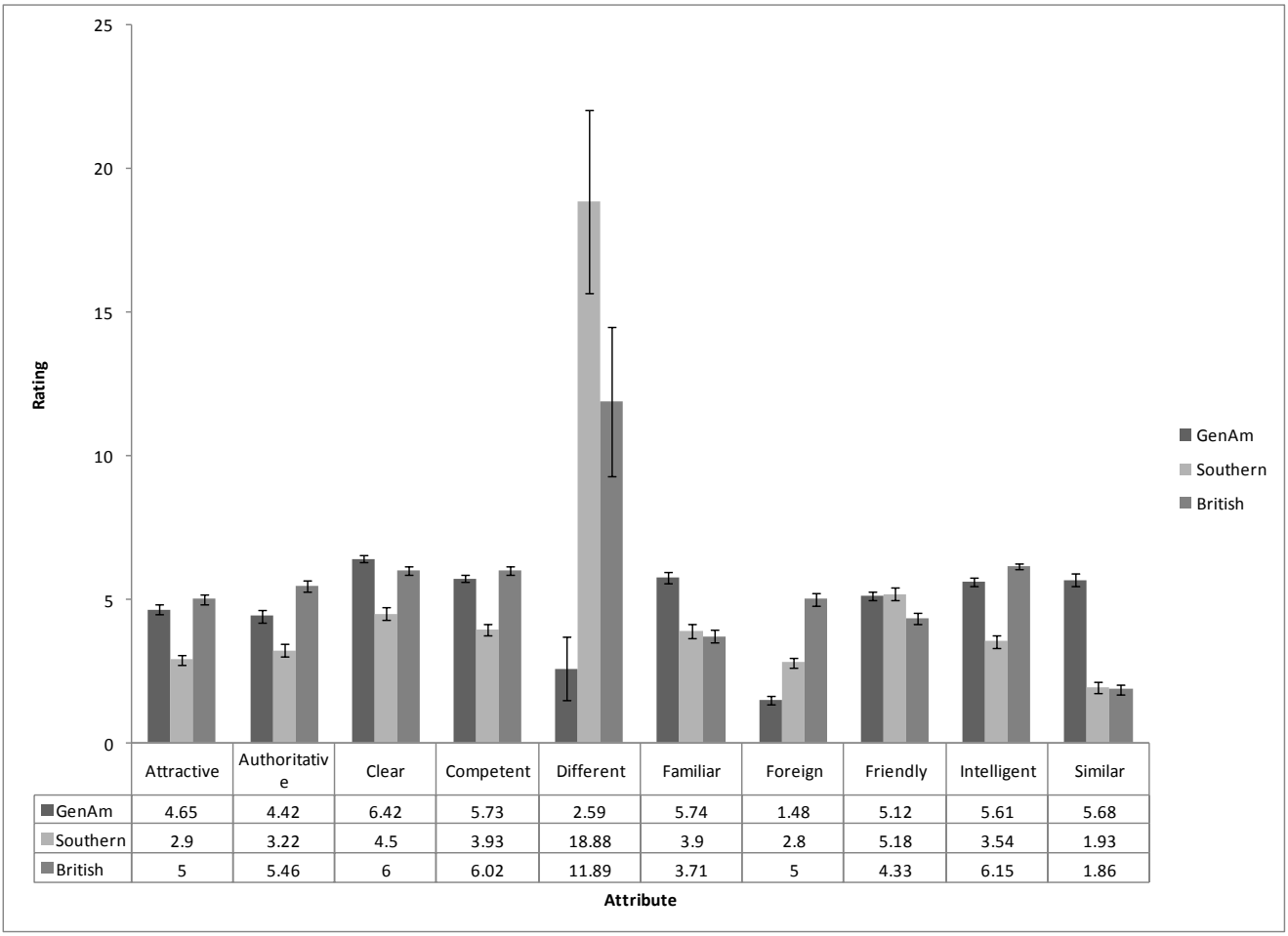


Figure 1. Mean ratings of perceived attributes denoted on the *x*-axis based on General American, Southern, and British accents.

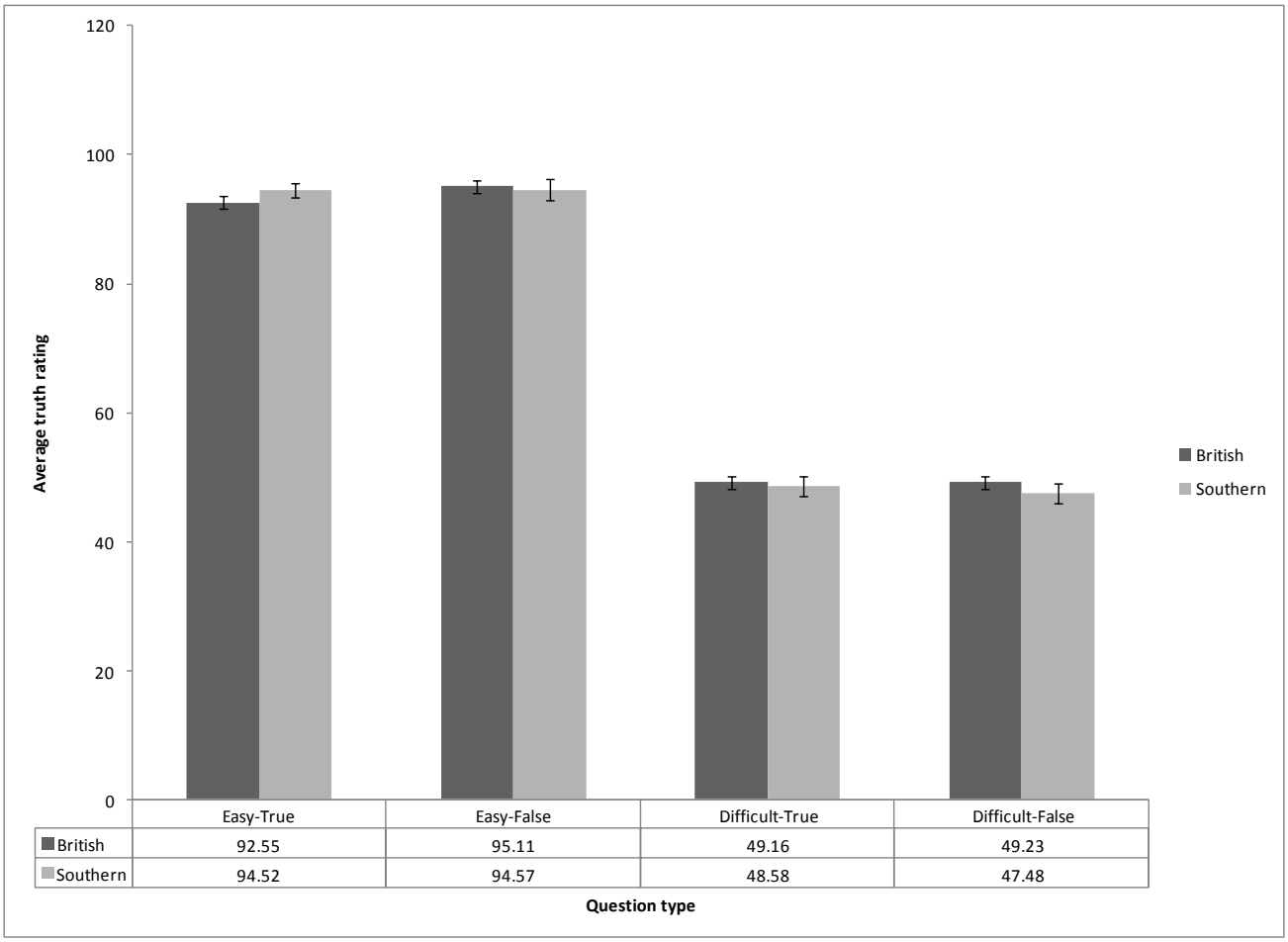


Figure 2. Average truth ratings of British and Southern statements from Experiment 1 based on accent. The *x*-axis denotes question type, such as if the question was easy or difficult and if the question was true or false. The average truth ratings from 0 to 100 are on the *y*-axis. All false questions were reverse coded. The higher the average truth rating, the higher the perceived veracity.

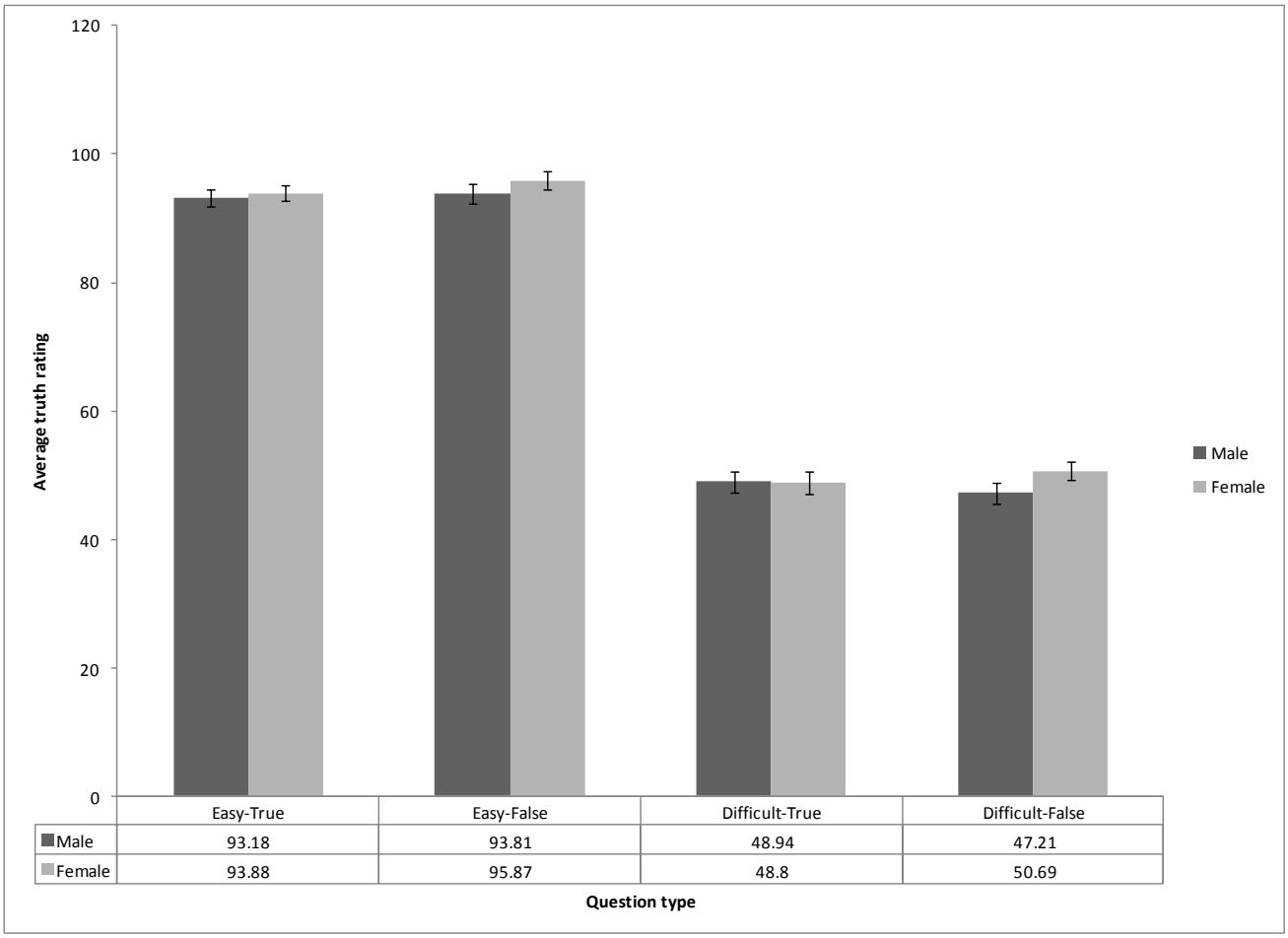
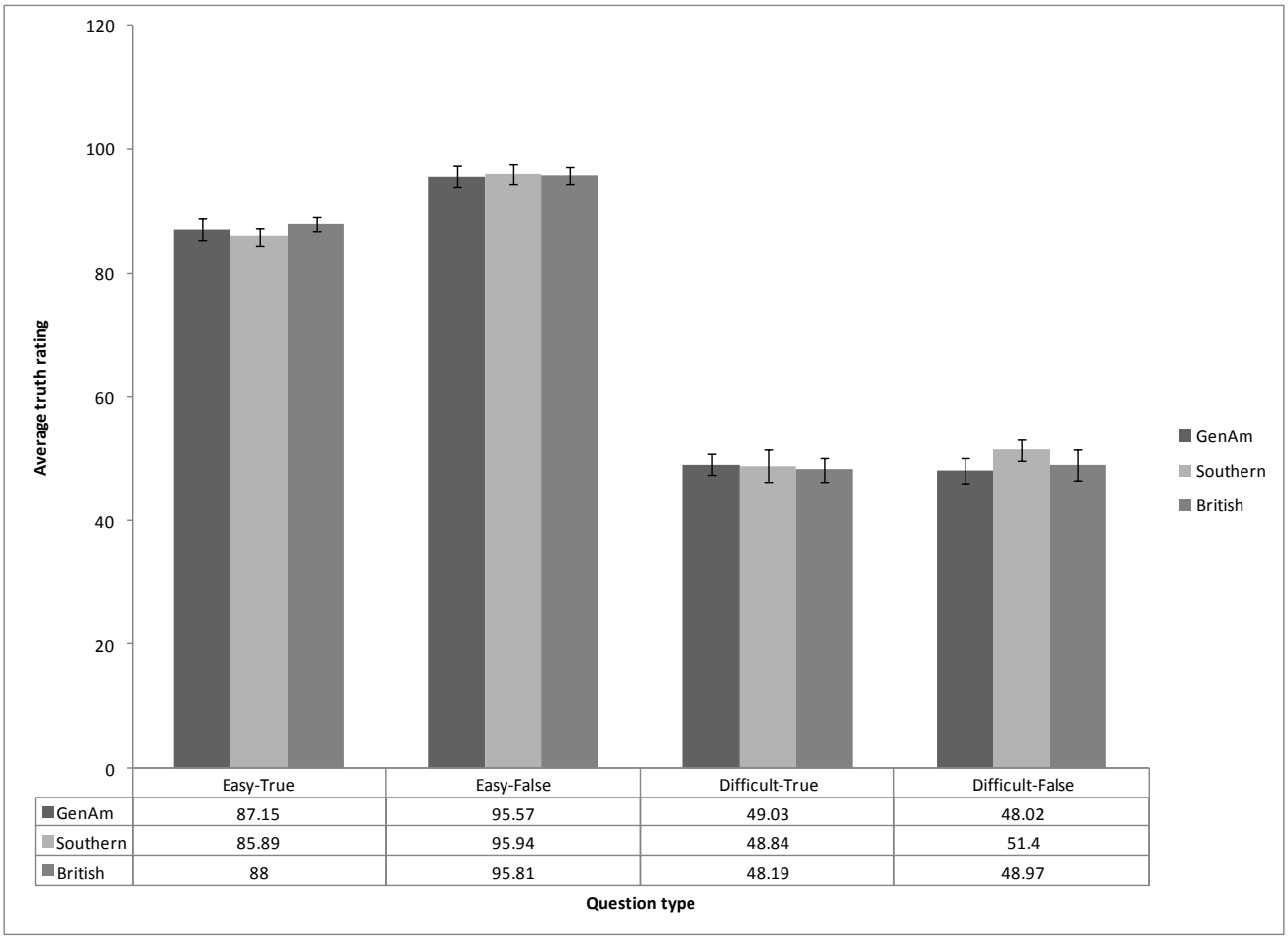


Figure 3. Average truth ratings of British and Southern statements from Experiment 1 based on gender. The *x*-axis denotes question type, such as if the question was easy or difficult and if the question was true or false. The average truth ratings from 0 to 100 are on the *y*-axis. All false questions were reverse coded. The higher the average truth rating, the higher the perceived veracity.



	Easy-True	Easy-False	Difficult-True	Difficult-False
GenAm	87.15	95.57	49.03	48.02
Southern	85.89	95.94	48.84	51.4
British	88	95.81	48.19	48.97

Figure 4. Average truth ratings of General American, Southern, and British statements from Experiment 2 based on accent. The *x*-axis denotes question type, such as if the question was easy or difficult and if the question was true or false. The average truth ratings from 0 to 100 are on the *y*-axis. All false questions were reverse coded. The higher the average truth rating, the higher the perceived veracity.

Appendices

Appendix A

Trivia statements

Easy-True

1. Sunlight contains ultraviolet radiation.
2. The formula for water is H_2O.
3. Dolphins belong to the class of mammals.
4. Bill Gates was a founder of Microsoft.
5. There are fifty states in the United States.
6. An apple is a fruit.
7. Neil Armstrong was the first person to walk on the moon.
8. There are seven continents on the Earth.
9. The Statue of Liberty is located in New York City.
10. Humans have two eyes.
11. There are 24 hours in a day.
12. Elephants are the largest land mammals on Earth.

Easy-False

1. Aristotle was a Japanese philosopher.
2. Lead is lighter than aluminum.
3. Pluto is the biggest planet of the solar system.
4. The Eiffel Tower is located in Germany.
5. Dogs are reptiles.

6. The capital of the United States is Los Angeles.
7. Christmas is observed on July 18th in the United States.
8. The Grand Canyon is located in New Jersey.
9. George Washington was the 20th president of the United States.
10. Broccoli is a fruit.
11. Texas shares a border with Canada.
12. The eye is the largest organ in the human body.

Difficult-True

1. The first modern-era Olympic champion was James Connolly.
2. Methuselah was the grandfather of Noah.
3. In 1877, Charles Darwin dug two holes in Stonehenge.
4. Ireland is the 20th largest island on earth.
5. A verruca is a type of wart.
6. A typical modern violin bow weighs two ounces.
7. Cadmium is an element that absorbs neutrons.
8. Green tea has an oxygen radical absorbance capacity of 1253.
9. There are 775 rooms in Buckingham Palace.
10. Talc has the lowest number on the Mohs scale.
11. Uzbekistan is doubly landlocked.
12. Owls are the only birds that can see the color blue.

Difficult-False

1. The speed of sound is independent from temperature.
2. The capital of Madagascar has an area of 40 square miles.
3. Cactuses can procreate via parthenogenesis.
4. The Sydney Harbour Bridge is the longest cantilever bridge in Australia.
5. Demeter was the Ancient Greek goddess of necessity.
6. Malaysia has five federal territories.
7. California is the only U.S. state that commercially grows coffee.
8. The Canadian side of Niagara Falls is higher than the American side.
9. Watermelons are native to South America.
10. Each of the two World Trade Center buildings had 121 floors.
11. DNA was discovered in 1956.
12. Bees have seven eyes.

Appendix B

Latin square for Experiment 1

M1 = Male 1 speaker, M2 = Male 2 speaker, F1 = Female 1 speaker, F2 = Female 2 speaker

B = British, S = Southern

Condition	**Item**	**List 1**	**List 2**	**List 3**	**List 4**	**List 5**	**List 6**	**List 7**	**List 8**
Easy True	1	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Easy True	2	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Easy True	3	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Easy True	4	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Easy True	5	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Easy True	6	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Easy True	7	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Easy True	8	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Easy True	9	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Easy True	10	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Easy True	11	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Easy True	12	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Easy False	1	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Easy False	2	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Easy False	3	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Easy False	4	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Easy False	5	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Easy False	6	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Easy False	7	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Easy False	8	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Easy False	9	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Easy False	10	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Easy False	11	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Easy False	12	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Diff-True	1	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Diff-True	2	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Diff-True	3	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Diff-True	4	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
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Diff-True	6	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Diff-True	7	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Diff-True	8	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Diff-True	9	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Diff-True	10	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Diff-True	11	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Diff-True	12	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Diff-False	1	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S

Diff-False	2	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Diff-False	3	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Diff-False	4	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
Diff-False	5	M1-B	M1-S	M2-B	M2-S	F1-B	F1-S	F2-B	F2-S
Diff-False	6	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Diff-False	7	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Diff-False	8	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B
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Diff-False	10	M2-S	M2-B	M1-S	M1-B	F2-S	F2-B	F1-S	F1-B
Diff-False	11	F1-B	F1-S	F2-B	F2-S	M1-B	M1-S	M2-B	M2-S
Diff-False	12	F2-S	F2-B	F1-S	F1-B	M2-S	M2-B	M1-S	M1-B