THE ROLE OF NATIVE LANGUAGE IN ATTITUDES TOWARD AND PERCEPTIONS OF NON-NATIVE AND NATIVE AMERICAN ENGLISH SPEECH

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Claire C. Chu

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AND
UNIVERSITY HONORS COLLEGE

This thesis was presented

by

Claire C. Chu

It was defended on

April 6, 2018

and approved by

Carrie Demmans Epp, Assistant Professor, Department of Computing Science,

University of Alberta

Charles A. Perfetti, University Professor, Department of Psychology

Natasha Tokowicz, Associate Professor, Department of Psychology

Thesis Advisor: Marta Ortega-Llebaria, Assistant Professor, Department of Linguistics

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The present study examined the effect of native language on attitudes and perceptions of accent in English to inform the development of a future intervention in Chinese-accented English. Most research in accented speech has focused on the native speakers' perspectives (Gluszek & Dovidio, 2010), but the novelty of this study lies in its consideration of non-native speakers' perspectives as well. Specifically, this study compared the perceived approachability and identity of speakers of Chinese-accented English and Standard American English by both Chinese native speakers (NS) and English NS. Moreover, it examined how these two groups of speakers perceived some linguistic traits that Chinese learners of English have difficulty producing natively. These included deaccentuation and the contrasts between [p] and [b], between [i] and [ɪ], and between modified nouns (blue bird) and compounds (bluebird). To do this, speech samples representing a range of accentedness were recorded from Chinese speakers of English and English NS telling a short story based on a pictorial sequence. These speakers also read sentences designed to elicit the target linguistic traits. The speech samples were included in questionnaires created to collect participants' ratings of the accentedness, intelligibility, approachability, and identity of the story samples, and to examine participants' perceptions of the linguistic traits used in the sentences. In addition, the participants were interviewed about their experiences interacting with people from different cultures.

The results show that accentedness is important in constructing identity, but approachability is more clearly predicted by intelligibility than accentedness. In addition,

Chinese NS have greater difficulty identifying suprasegmental traits than segmental traits, whereas English NS identify both types of traits quite accurately. These trends will guide the development of future interventions that increase the approachability of members of the two language groups to each other, encouraging social contact across cultural boundaries. Such interventions, applied across many languages, may improve interactions among people from different language backgrounds and lead to greater empathy among cultural groups.

Keywords: accentedness, intelligibility, L1 influence, Chinese accent

TABLE OF CONTENTS

ACKNOWLEDGMENTS XI

1.0 INTRODUCTION 1

1.1 SOCIAL ATTITUDES TORWARD NON-NATIVE ACCENT 2

1.2 PERCEPTION OF LINGUISTIC TRAITS IN SPEECH 4

1.3 INTERVENTIONS TO ENCOURAGE COMMUNICATION 7

2.0 METHODS 9

2.1 PARTICIPANTS 9

2.1.1 Speakers recorded for materials 9

2.1.2 Raters of accentedness in speech samples 10

2.1.3 Listening survey participants 10

2.2 MATERIALS 12

2.2.1 Speech samples 12

2.2.1.1 Materials for speech samples 12

2.2.1.2 Determining levels of accentedness 13

2.2.1.3 Stimuli selection criteria 14

2.3 PROCEDURE 15

2.3.1 Language background 15

2.3.2 Attitudes questionnaire 15

2.3.3 Perceptions questionnaire 16

2.3.4 Interview 17

2.4 STATISTICAL ANALYSES 17

2.4.1 Attitudes questionnaire 17

2.4.2 Perceptions questionnaire 19

3.0 RESULTS 20

3.1 ATTITUDES QUESTIONNAIRE 20

3.1.1 Factors influencing approachability 20

3.1.2 Factors influencing identity 23

3.2 PERCEPTIONS QUESTIONNAIRE 25

3.2.1 Identification of traits in words 26

3.2.2 Identification of traits in sentences 28

4.0 DISCUSSION 30

4.1 ATTITUDES 30

4.1.1 Becoming more approachable 30

4.1.2 Issues of identity 31

4.2 LINGUISTIC TRAITS 32

4.3 DESIGNING AN INTERVENTION 34

4.4 FUTURE DIRECTIONS 35

APPENDIX A 37

APPENDIX B 38

APPENDIX C 40

APPENDIX D 42

APPENDIX E 45

APPENDIX F 46

APPENDIX G 48

BIBLIOGRAPHY 51

LIST OF TABLES

Table 1. Average self-rated proficiencies of speakers 10

Table 2. Average proficiencies of listeners 11

Table 3. Number of speakers recorded per group 14

Table 4. Number of speakers selected per group for attitudes questionnaire 14

Table 5. Summary of results for attitudes questionnaire 20

Table 6. Summary of perception of traits 25

Table 7. Effects of participant L1, accentedness, and identity on approachability 48

Table 8. ANOVA of accentedness and L1 on approachability 48

Table 9. ANOVA of intelligibility and L1 on approachability 48

Table 10. ANOVA of accentedness and L1 on identity 50

Table 11. ANOVA of intelligibility and L1 on identity 50

Table 12. Perception of traits in words by L1 50

Table 13. ANOVA of trait and L1 on identification in sentences 50

LIST OF FIGURES

Figure 1. Approachability versus accentedness and participant L1 22

Figure 2. Approachability versus intelligibility and participant L1 23

Figure 3. Identity versus accentedness and participant L1 24

Figure 4. Identity versus intelligibility and participant L1 25

Figure 5. Perception of target traits by participant L1 27

Figure 6. Explanation of target traits by participant L1 28

Figure 7. Identification of target traits by participant L1 29

Figure 8. Cartoon sequence for spontaneous speech samples 37

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1.0 INTRODUCTION

According to social identity theory (Tafjel & Turner, 1986), we tend to view people we perceive as similar to ourselves more positively, and we regard those we perceive as different more negatively. This theory offers an explanation for the negative attitudes people may hold toward immigrants and foreign visitors (Esses, Jackson, & Armstrong, 1998; Kessler & Freeman, 2005; Simon & Lynch, 1999), which may also be directed toward international students because research suggests that barriers to intercultural communication are correlated with prejudice (Spencer-Rodgers & McGovern, 2002). Although these negative attitudes can be moderated by social contact with the immigrant culture (Spencer-Rodgers & McGovern, 2002), foreign accent can lead to stigma (Gluszek & Dovidio, 2010) and the exclusion of students with different native languages on a university campus. Thus, interventions that mitigate the perception of foreign accent as an indicator of difference would increase inclusion on college campuses (Dunstan, Wolfram, Jaeger, & Crandall, 2015).

The large Chinese student population in the U.S. makes Chinese-accented English an ideal starting point in intervention research. Chinese students are the largest population of international students in the nation, comprising about 30 percent of the international student body (John, 2016). Pittsburgh has seen a 68 percent increase in people who identify as mainland Chinese from 2000 to 2010, and Chinese student enrollment at the University of Pittsburgh and Carnegie Mellon University tripled over this decade (Cato & Bowling, 2012). At the University

of Pittsburgh, the percentage of Chinese international students is much higher than the national average; Chinese students comprise almost 60% of international students and 6% of the entire student body (Office of Institutional Research, 2017). Thus, the perception of Chinese-accented English by Chinese and American students is a critical target for these interventions to ease students' transitions to the university and the wider community.

Before designing such programs, however, current attitudes of both Chinese and American students toward speakers of Chinese-accented English and native English must be understood, as must perceptions of foreign accent in English by both groups of students. This is the goal of the present study, which examined (1) effects of a speaker's accent and intelligibility on their perceived approachability and identity by Chinese and American students, and (2) the perception of linguistic traits of Chinese accent in English by both Chinese and English native speakers.

1.1 SOCIAL ATTITUDES TORWARD NON-NATIVE ACCENT

The first goal of the present study was to investigate the effects of perceived accent on social attitudes between Chinese and American students. Native listeners perceive speakers of non-native accents more negatively than speakers of native accents (Fuertes, Gottdiener, Martin, Gilbert, & Giles, 2011), and the stronger the accent, the more negative the evaluations (Ryan, Carranza, & Moffie, 1977). These perceptions pervade evaluations of traits as diverse as intelligence, trustworthiness, liveliness, and social status (Fuertes et al., 2011). Although social norms typically prevent overt discrimination on the basis of accent, speakers of non-native accents experience exclusion in housing and employment, much like speakers of low-prestige

dialects (Biernat & Dovidio, 2000). These perceptions also manifest in the classroom, where undergraduate students are increasingly taught by teaching assistants and professors with non-native accents (Bresnahan, Ohashi, Nebashi, Liu, & Shearman, 2002; Rubin, 1992).

Research on attitudes toward speakers of non-native accent in an American college setting suggests that attitudes and affective responses are mediated by the identity (friend or teacher) and intelligibility of the interlocutor and by American participants' sense of ethnic identity (Bresnahan et al., 2002). Friends were viewed more positively than teachers overall, and more intelligible accented English was received more favorably than less intelligible accented English, especially for people with stronger White ethnic identity. This research suggests that accent influences attitudes in native English speakers, which may form barriers between groups.

However, undergraduate student performance is not affected by the accent of the teacher; rather, it is the perception of accent that predicts student attitudes and performance (Rubin, 1992). Students who perceive a stronger non-native accent in a lecturer perform worse than students who perceive a more native accent. These perceptions of accent are often mediated by visual cues; for example, Thai children who spoke to native Thai speakers of Chinese ethnicity falsely perceived a non-native accent and accommodated it (Beebe, 1981). Negative evaluations of speakers of a non-native accent lead to stigmatization in many social contexts, and the perception of accent can be influenced by visual cues as well.

Altogether, these studies suggest that American students will favor native speakers of English. However, there is little research to predict the preferences of second language learners in their second language, that is, the preferences of Chinese students for accent in English. Chinese students may identify more closely with non-native English speakers and thus feel more positively about them, but they may also feel more positively about native English speakers

because they find them easier to comprehend. Either way, it is important to consider non-native speakers' perspectives in an intervention. To this end, both Chinese and American participants listened to recordings of Chinese-accented English and native speakers' English samples and rated them on measures of accentedness, intelligibility, approachability, and identity. In addition, participants were interviewed to learn more about their experiences with language and accent in different social contexts in the U.S.

1.2 PERCEPTION OF LINGUISTIC TRAITS IN SPEECH

To explore speech traits to include in a potential future intervention to increase communication between international and domestic students, the present study examined the perception of traits of Chinese-accented English by both Chinese and English NS. Ratings of accentedness in non-native speech by English NS are closely tied to aspects of pronunciation, such as segmentals, word stress, and intonation. Other variables, such as fluency and grammar, are more closely related to comprehensibility. In Chinese-accented English, differences in the pronunciation of segmentals are especially salient markers to native English speakers (Crowther et al., 2014). However, foreign language learners tend to rate their own accentedness and comprehensibility inconsistently with native speakers in the areas of phonological accuracy and temporal fluency; beginning second language learners overestimate their abilities and advanced learners underestimate them. Self-evaluations at the lexical, grammatical, and discourse levels, on the other hand, tend to be more consistent with native speakers' ratings (Trofimovich, Isaacs, Kennedy, Saito, & Crowther, 2014). Together, these findings suggest that segmentals are important to native English speakers evaluating accent in Chinese English, but Chinese speakers

of English may perceive them differently, leading to inconsistent ratings with English NS. Thus, the second goal of the present study was to compare the perception of possible segmental indicators of Chinese accent between Chinese and English speakers.

Chinese speakers may also have difficulty with English intonation and word stress because they interpret the system of stress in English speech using the lexical tones of their native language (Ortega-Llebaria, Nemogá, & Presson, 2015). Lexical tone is the movement of pitch over speech that gives individual words meaning; the same syllable said with a different tone will have a different meaning in Chinese. For example, depending on its tone, *zhi* can be a measure word for long, rigid objects (flat tone) or mean straight (rising tone), paper (falling-rising tone), or birthmark (falling tone). On the other hand, English does not use lexical tone. *Lion* refers to the same concept, an animal, whether it is said with a rising intonation, as in a question, or with a falling intonation, as with a statement. Instead, English uses pitch movement across phrases to add nuances in meaning. When learning English, however, Chinese learners may subconsciously assign tone-like representations to English words due to the importance of lexical tone in their native language, and the difference may become perceptible in English deaccentuation and compounding (Gussenhoven, 2014).

Deaccentuation is the low, flat intonation applied over a clause after an emphasis. In the sentence *Sally, who was late for work, forgot to comb her hair as she ran out the door*, deaccentuation occurs over the appositive "who was late for work." "Late" would usually be stressed, as in the sentence *She was late for work*, but in the deaccentuated clause, it is not. Chinese learners of English may be unable to modify their representation of English stress to accommodate the removal of stress from a deaccentuated clause. In words, stress patterns also differentiate compound nouns, such as the *White House*, from modified nouns, such as a *white*

house. In *White House*, only “White” is stressed, whereas both words are stressed in *white house*. The lexical tone-based representation of stress may limit a Chinese learner’s range of pitch patterns over a set of syllables, whereas pitch movement may vary more fluidly with the intonation of the entire sentence for an English NS (Gussenhoven, 2014).

Given this information on potential areas of difficulty for Chinese learners of English, the present study included four target speech traits, which can be broadly categorized into segmental traits at the vowel or consonant level and suprasegmental traits at the word or sentence level. The two segmental traits were selected from sounds produced by native Mandarin speakers that tend to be misperceived by native English speakers: the differentiation between the long *e* ([i]) and short *i* ([ɪ]) sounds, as in *seat* and *sit*, and the differentiation between word-medial *p* ([p]) and *b* ([b]) sounds, as in *staple* and *stable* (Rogers & Dalby, 2005). The suprasegmental features focused on stress patterns and intonation in compounds and deaccentuated clauses (Gussenhoven, 2014). Speakers with Chinese and American accents were recorded reading English sentences designed to include the target speech traits. These sentences were then played for Chinese and American listeners to test for perception and identification of the target traits. Although both Chinese and American listeners may be able to hear the target traits in isolation, Chinese listeners may have greater difficulty identifying the traits in context because they are less attuned to nuances in English speech, which could inhibit the communication of more subtle cues that convey tone.

1.3 INTERVENTIONS TO ENCOURAGE COMMUNICATION

To mitigate the stigma associated with nonstandard accent, Dunstan and colleagues (2015) implemented a series of workshops that effectively taught university students about language ideologies and the threats they pose to language diversity. After the program, the students became more open-minded toward diversity in accent, recognizing that "standard" varieties are social constructs and that all speakers necessarily speak a dialect of a language. Although the results of this study are promising for decreasing discrimination on the basis of accent, it did not consider whether this program actually encouraged more cross-dialectal communication among students who completed it. Researchers have also trained native English speakers to better comprehend specific non-native accents. Native English listeners can quickly adapt to non-native speech (Clarke & Garrett, 2004), and exposure to multiple speakers of Chinese-accented English improved perception of an unfamiliar speaker of Chinese-accented English (Bradlow & Bent, 2003).

The intervention that will be informed by the results from the present study will improve on the previous research by encouraging increased communication between groups in two ways. First, the specificity of the speech traits that will be targeted will increase the intelligibility of American and Chinese students to each other. Second, the intervention requires the participation of both American and Chinese students, which divides the communicative burden more equally between native and non-native speakers. The second point provides a contrast to traditional methods of accent reduction, which maintain that the native speaker's accent is correct and that problems with comprehensibility are the fault of the non-native speaker (Griffen, 1991, as cited in Munro & Derwing, 1995).

Participation by American speakers and the resulting increase in communication with international students would also be valuable to the students as an introduction to the use of English as a lingua franca, a common language used among speakers with different native languages. In international groups, native English speakers often decrease efficacy by lacing their language with cultural nuances—abbreviations, jokes, words with conflicting meanings—that non-native speakers do not understand (Morrison, 2016). They also dominate conversations by speaking too quickly. Non-native English speakers, unwilling to appear ignorant, may only pretend to understand large portions of discussion. By interacting more with non-native English speakers, American students can develop a better sense of the cultural intricacies of the English language and learn to modify their speech in an international setting.

The present study used listening tasks with questions and rating scales and interviews to examine existing attitudes of Chinese and English NS toward speakers of non-native and native English in addition to perceptions of linguistic traits of Chinese-accented English by both groups. The results will contribute to a multifaceted understanding of the role of non-native accent in social contexts that will be useful to develop interventions to integrate domestic and international students on college campuses.

2.0 METHODS

2.1 PARTICIPANTS

2.1.1 Speakers recorded for materials

Speakers of various backgrounds participated in this study to produce speech samples covering a range of English accentedness, including varying strengths of Chinese-accented English and native American English. Twenty-nine speakers (12 female, 17 male) from Pittsburgh, Pennsylvania (15); Philadelphia, Pennsylvania (3); Honolulu, Hawaii (2); Taipei, Taiwan (6); and Beijing, China (3) recorded speech samples. The speakers included English NS (7), Chinese NS (19), and English–Chinese bilinguals who grew up in the U.S. with Chinese-speaking parents (3). Self-ratings of proficiencies in reading, writing, speaking, and listening for English and Chinese are shown in Table 1. Undergraduate students (12), graduate students (8), and professionals (9) were represented. Speakers did not receive compensation.

Table 1. Average self-rated proficiencies of speakers

Native Language	English				Chinese			
	Reading	Writing	Speaking	Listening	Reading	Writing	Speaking	Listening
English[a]	4.67 (.52)	4.33 (.82)	4.50 (.55)	4.83 (.41)	—	—	—	—
Chinese[b]	3.44 (.70)	3.17 (.79)	3.06 (.72)	3.33 (.84)	4.88 (.34)	4.56 (.51)	4.75 (.57)	4.88 (.34)
English–Chinese Bilinguals	5.00 (.00)	5.00 (.00)	5.00 (.00)	5.00 (.00)	2.67 (2.08)	2.67 (1.52)	4.67 (.57)	5.00 (0.00)

Note. Ratings are on a 1–5 scale (1 = *beginner*, 5 = *advanced*). Values are reported as *M* (*SD*).
[a]One speaker did not provide ratings. [b]Two speakers did not provide ratings.

2.1.2 Raters of accentedness in speech samples

Five raters (4 female, 1 male) from Pittsburgh, Pennsylvania (3) and Philadelphia, Pennsylvania (2) rated the speakers' recordings on a seven-point scale of accent strength. Two raters were English NS, two were English–Chinese bilinguals, and one was a Chinese NS who had lived in the U.S. for 30 years.

2.1.3 Listening survey participants

Thirty-four students (32) and recent graduates (2) from the University of Pittsburgh (33) and Carnegie Mellon University (1) participated in this study. Two participants were excluded from analyses because they had native proficiency in a language other than English, Mandarin, or a Chinese dialect, leaving a sample of nineteen English NS, twelve Chinese NS, and one English–Chinese bilingual. For the analyses, the English–Chinese bilingual was classified as an English NS based on self-ratings.

The 20 English NS (14 female, 6 male) were undergraduate students (18), a recent graduate (1), and a graduate student (1) who had lived in the U.S. for most of their lives. Their average self-rated proficiencies in English for reading, writing, speaking, and listening are shown in Table 2, as is their average score on the LexTALE (Lemhöfer & Broersma, 2012), an objective measure of English proficiency. Participants also learned languages including Mandarin (2), Spanish (6), German (3), Japanese (1), and Korean (1) later in life.

The 12 Chinese NS (9 female, 3 male) also included undergraduate students (5), graduate students (6), and a recent graduate (1). They had been living in the U.S. for six months to five years (M = 31 months, SD = 26 months) at the time of the study. Average self-rated proficiencies in English and Chinese for reading, writing, speaking, and listening are shown in Table 2, as is their average score on the English LexTALE (Lemhöfer & Broersma, 2012). In addition to English, some participants also learned languages including Japanese (3), French (1), and Italian (1) later in life.

Participants received a $5 gift card and were entered into a raffle for one of ten $25 gift cards. This protocol was approved by the Institutional Review Board (IRB) at the University of Pittsburgh.

Table 2. Average proficiencies of listeners

Native Language	English					Chinese			
	Reading	Writing	Speaking	Listening	LexTALE Score (%)	Reading	Writing	Speaking	Listening
English	4.90 (.30)	4.86 (.35)	4.95 (.22)	5.00 (0.00)	86.5 (13.8)	—	—	—	—
Chinese	4.15 (.80)	3.92 (.86)	3.76 (.83)	4.00 (.58)	75.4 (11.7)	5.00 (.00)	5.00 (.00)	5.00 (.00)	5.00 (.00)

Note. Ratings are on a 1–5 scale (1 = *beginner*, 5 = *advanced*). Values are reported as *M* (*SD*).

2.2 MATERIALS

2.2.1 Speech samples

2.2.1.1 Materials for speech samples

To obtain speech samples for the attitudes questionnaire, speakers were given a cartoon sequence of six images depicting a girl's day (see Appendix A) to elicit samples of natural, semi-spontaneous speech (Brown, 2004, as cited in Winokur, n.d.). Speakers were given a few minutes to silently look over the cartoon and gather their thoughts before they were recorded telling a short story based on the sequence.

For the speech samples used in the perceptions questionnaire, a list of 28 sentences (see Appendix B) was developed to include four suprasegmental and segmental features that the literature suggests are characteristic of Chinese-accented English. These features are compounds, deaccentuation (Gussenhoven, 2014), differentiation between the long *e* ([i]) and short *i* ([ɪ]) sounds, and differentiation between *p* ([p]) and *b* ([b]) in a word-medial position (Rogers & Dalby, 2005). For the sentences containing compounds and segmental features, the target words were placed at the end of the sentence in both statement and question forms. The speakers read each sentence as many times as they needed to record the sentence fluently; no speaker read a sentence more than two times.

All recordings were made in quiet rooms. Speakers in Pittsburgh were recorded using the internal microphone of a Lenovo Yoga 2 Pro laptop with Praat software. Speakers located elsewhere recorded themselves with their own equipment, including mobile phones, laptops, and computers. All recordings were normalized to 70 dB in Praat and filtered to reduce background noise using spectral subtraction with a filter frequency range of 80.0 to 10000.0 Hz and

smoothing of 40.0 Hz. For the stories, only the description of the first panel of the cartoon was used in the survey to decrease the length of the attitudes questionnaire. The end of the speech sample was determined by the end of the spoken clause, and samples ranged from eight to 12 seconds in length. For the sentences, if a sentence was read multiple times, the most fluent iteration was used.

2.2.1.2 Determining levels of accentedness

Recorded speech samples were divided into one of twelve groups by gender (male, female), native language (English, Chinese), and accentedness (strong, medium, weak). To simplify the categorization, samples from English–Chinese bilinguals were classified as native English based on the bilinguals' self-rated proficiencies. Accentedness of the speech samples was determined based on the judgments of the five raters described in the participants section. The raters listened to the stories and sentences of each speaker, then rated them on a seven-point scale of accent strength. The ratings for each speaker were then averaged to obtain an accentedness score, and the mean and standard deviation of the accentedness scores were calculated. Speakers whose accentedness scores fell within one standard deviation of the mean were categorized as being of medium accentedness. Speakers who were more than one standard deviation below the mean were categorized as being of weak accentedness, and those more than one standard deviation above were categorized as being of strong accentedness. This resulted in the distribution of the speakers within the groups shown in Table 3.

Table 3. Number of speakers recorded per group

	English NS			Chinese NS		
	Accentedness			Accentedness		
Gender	Strong	Medium	Low	Strong	Medium	Low
Male	0	0	5	2	10	0
Female	0	1	3	1	6	0

2.2.1.3 Stimuli selection criteria

From the recordings, 12 speakers' stories were included in the attitudes questionnaire to represent a range of speaker groups. Four speakers' sentences were used in the perceptions questionnaire to highlight contrasts in the target linguistic traits between speakers with different native languages.

For the stories included in the attitudes questionnaire, two speakers from each of the twelve groups were selected when possible. Groups with no speakers were not represented in the questionnaire. If a group only had one or two speakers, they were automatically included in the questionnaire. For groups with more than two speakers, the final speakers were selected to have similar accentedness scores and higher quality recordings. This resulted in 12 speakers representing seven groups, distributed as shown in Table 4.

Table 4. Number of speakers selected per group for attitudes questionnaire

	English NS			Chinese NS		
	Accentedness			Accentedness		
Gender	Strong	Medium	Low	Strong	Medium	Low
Male	0	0	2	2	2	0
Female	0	1	2	1	2	0

The four speakers whose sentences were used in the perceptions questionnaire were divided by gender (2 male, 2 female) and accentedness (2 high, 2 low). The two high and two low accentedness speakers were selected to have similar accentedness scores, and the selected speakers' recordings were of high quality for all 28 sentences.

2.3 PROCEDURE

2.3.1 Language background

In a Qualtrics survey (see Appendix C), participants indicated their language background by listing up to four languages they spoke or had learned, standardized test scores for the languages where available, and self-ratings on five-point Likert scales of proficiencies in reading, writing, speaking, and listening. They also completed the LexTALE (www.lextale.com) (Lemhöfer & Broersma, 2012) as a quick, objective score of English proficiency.

2.3.2 Attitudes questionnaire

After completing the language background tasks, participants were introduced to the task of the attitudes questionnaire in Qualtrics and shown the cartoon sequence on which the story speech samples were based. Although all surveys were written in English, participants were told they could answer in Chinese if they felt more comfortable doing so. They then listened to one speaker from each of the seven groups for a total of seven speech samples. The order of presentation of the groups was randomized. For groups with two speakers, the speaker heard by

the participant was randomly selected as well. After listening to the sample from each speaker, participants answered questions about the speaker's accentedness, comprehensibility, and approachability (see Appendix D) before moving on to the next speech sample. They were also asked to identify specific features of speech that influenced their answers. Participants were encouraged to replay each speech sample as many times as they needed to answer the questions fully.

2.3.3 Perceptions questionnaire

Participants met with the experimenter within a week of completing the attitudes questionnaire to continue the study. They completed the perceptions questionnaire (Appendix E) in Qualtrics in the presence of the experimenter so that they could ask questions if necessary. The sentences were grouped by the four targeted suprasegmental or segmental traits. Within each trait, the order of the sentences was randomized, and the order of the four traits was randomized as well. The speaker heard by the participant for each sentence was randomly selected from the four included speakers. The participants were first introduced to the task. Then, they heard two words or sentences that demonstrated the target feature of the upcoming block of sentences. If they perceived a difference, they were asked to describe the difference. Then, they listened to each sentence within the block and rated accentedness and comprehensibility after each sentence. If the participant indicated that they perceived a difference earlier, they were shown the sentence with the target word(s) bolded (segmental differentiation, deaccentuation) or missing (compounds) and asked to identify which of the two versions was spoken in the sentence. Participants were encouraged to play each recording as many times as they needed to answer correctly. They were also advised to place less weight on context and spelling because an accent

may cause them to be misleading. After finishing all the sentences in a block of targeted traits, participants moved on to the next block.

2.3.4 Interview

After finishing the perceptions questionnaire, the participants were interviewed. The questions (see Appendix F) depended on the participant's language background, and the interviews were conducted in both English and Chinese depending on the participant and the flow of the conversation. Chinese NS were asked about their language preferences in various contexts and how their language background influenced their experiences in the U.S. English NS were asked about their interactions with speakers of foreign or regionally accented English. The interviews were recorded, then transcribed.

2.4 STATISTICAL ANALYSES

2.4.1 Attitudes questionnaire

An approachability composite score was determined for each sample for each participant. This score was calculated from responses to questions 3, 5, 6, and 10 in the attitudes questionnaire (see Appendix D). Each response was converted to a numerical value by scoring the Likert scale from one to five such that one corresponded with low approachability (e.g., "Very unfriendly," "Very unlikely to hold an engaging conversation") and five corresponded with high approachability (e.g., "Very friendly, Very likely to hold an engaging conversation"). The

approachability composite score was the sum of these values across the four questions for the sample divided by 20 (the greatest possible value of the sum), so it ranged from 4/20 = 0.20 (least approachable) to 20/20 = 1.00 (most approachable).

Similarly, an identity composite score was calculated for each sample for each participant. First, the responses to the question 14 “Where do you think this speaker is from?” was coded as follows: 1 = U.S., 2 = an English-speaking country that is not the U.S. (e.g., England). 3 = Asia outside of East Asia (e.g., Asia, India), 4 = East Asia outside of a Chinese-speaking country (e.g., Korea), 5 = a Chinese-speaking country (e.g., China, Taiwan), and 0 = other (e.g., Holland, Brazil). Numerical values one to five were assigned to responses about language (questions 9 and 12) and education (question 16) such that one corresponded with “Definitely English” and “Did not complete high school” and five corresponded with “Definitely Chinese” and “Holds graduate degree.” Responses of “Other” were coded as zero. To calculate the identity composite score, the numerical values of the responses were added together, then divided by the total possible value, which varied if any responses were coded as zero. For example, if a participant spoke only English and did not respond to questions 9 and 12, the total possible value would not include those ten points. Thus, identity composite score ranged from 0.20 (strong American identity) to 1.00 (strong Chinese identity).

An omnibus three-way analysis of variance (ANOVA) with alpha-value .05, fixed factors participant L1, accent, and identity composite score, and dependent variable approachability composite score showed no significant two- or three-way interactions (Table 7 in Appendix G). Thus, two-way ANOVAs are presented in the results section.

2.4.2 Perceptions questionnaire

For participants who indicated that they heard the difference between two words illustrating the target trait, the responses to question 2 “Explain the difference you heard” were coded on a scale from zero to three, with zero corresponding to a wrong answer, one corresponding to a difference that was not the target trait, two corresponding to identification of the target trait without indication of understanding of the meaning difference, and three corresponding to a full understanding of the target trait. A sentence identification score was also calculated for these participants as the proportion of sentences per trait they identified with the correct version of the target trait. For the compound sentences, only sentences that constrained the meaning of the target were used (sentences 2-5, 9, 11 in Appendix B); all sentences in the three other traits were included in the identification score.

3.0 RESULTS

3.1 ATTITUDES QUESTIONNAIRE

Table 5. Summary of results for attitudes questionnaire

Fixed Factors	Approachability	Identity
Accent	n.s.	***
Participant L1	***	***
Participant L1 × Accentedness	**	*
Intelligibility	***	***
Participant L1	n.s.	**
Participant L1 × Intelligibility	n.s.	n.s.

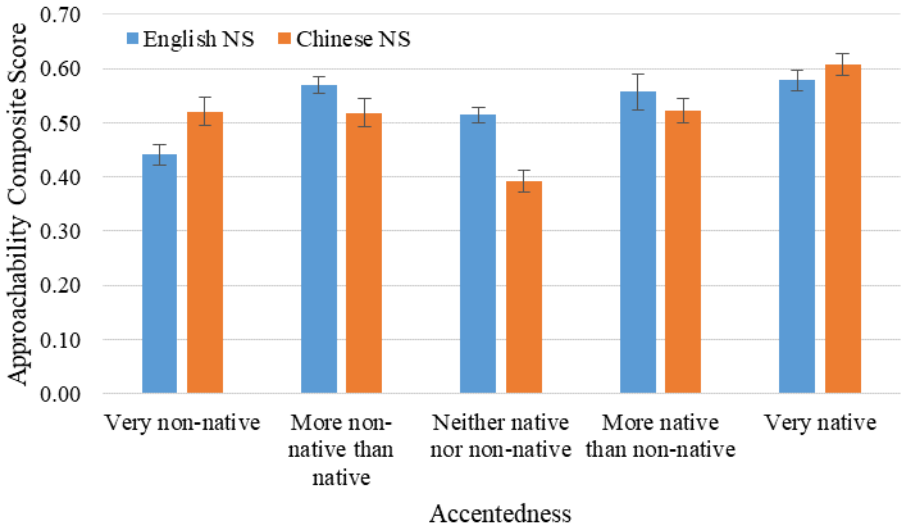
***$p < .001$. **$.001 \leq p \leq .050$. *$.050 < p < .065$. n.s. = not significant

To compare the effects of accent and intelligibility on measures of approachability and identity perceived by Chinese and American participants, two-way ANOVAs were run. Overall, as shown in Table 5, approachability is affected by participant L1 and its interaction with perceived accent in addition to intelligibility, and identity is influenced by accent, intelligibility, and participant L1.

3.1.1 Factors influencing approachability

To determine the effects of accent and participant L1 on approachability, a two-way ANOVA (Table 8 in Appendix G) with fixed factors accent and L1 and dependent variable

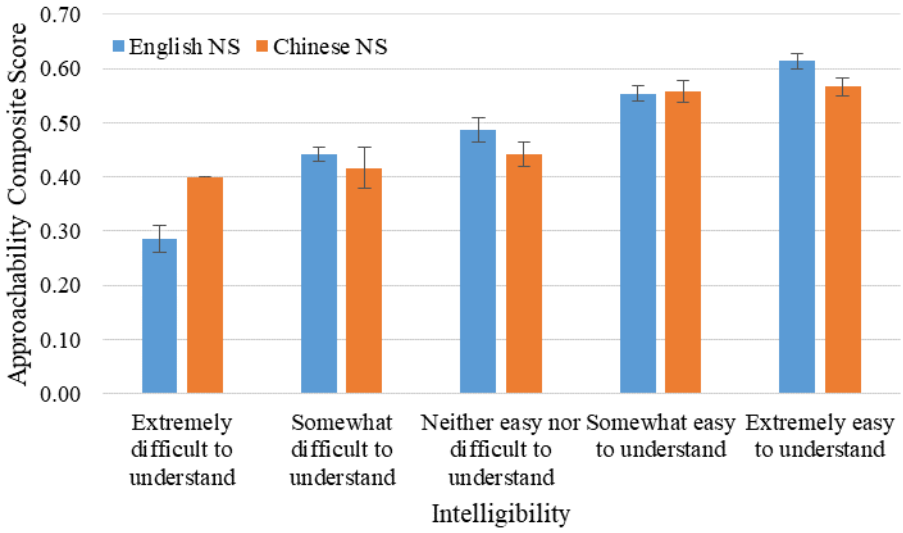
approachability composite score was run with an alpha value of .05. The main effect of participant L1 was nonsignificant, $F(1, 205) = 1.11$, $p = .29$, $\eta_p^2 = .005$. The main effect of accent was significant such that speakers with accents rated as 5 “Very native” ($M = .59$, $SD = .11$), were most approachable, followed by speakers with accents rated as 2 “More non-native than native” ($M = .55$, $SD = .10$) and as 4 “More native than non-native” ($M = .54$, $SD = .11$), with speakers with accents rated as 1 “Very non-native” ($M = .47$, $SD = .12$) and as 3 “Neither native nor non-native” ($M = .45$, $SD = .08$) rated least approachable, $F(4, 205) = 9.76$, $p < .001$, $\eta_p^2 = .16$. The interaction between participant L1 and accent was also significant such that Chinese NS considered speakers with accent 3 “Neither native nor non-native” ($M = .39$, $SD = .05$) less approachable than did English NS ($M = .51$, $SD = .04$), and Chinese NS considered speakers with accent 1 “Very non-native” ($M = .52$, $SD = .12$) more approachable than did English NS ($M = .44$, $SD = .11$), $F(4, 205) = 4.16$, $p = .003$, $\eta_p^2 = .075$. These results are illustrated in Figure 1.



Approachability composite score ranges from 0.20 (low approachability) to 1.00 (high approachability). Error bars represent standard error.

Figure 1. Approachability versus accentedness and participant L1

For the effect of intelligibility on approachability, a two-way ANOVA (Table 9 in Appendix G) with fixed factors intelligibility and participant L1 and dependent variable approachability composite score was run with an alpha value of .05. As shown in Figure 2, the main effect of participant L1 was nonsignificant, $F(1, 205) = .003$, $p = .96$, $\eta_p^2 = .000$. The main effect of intelligibility was significant such that speakers rated 5 "Extremely easy to understand" ($M = .59$, $SD = .10$) were most approachable, followed by 4 "Somewhat easy to understand" ($M = .56$, $SD = .09$), 3 "Neither easy nor difficult to understand" ($M = .47$, $SD = .08$), 2 "Somewhat difficult to understand" ($M = .43$, $SD = .08$), then 1 "Extremely difficult to understand" ($M = .30$, $SD = .07$), $F(4, 205) = 24.4$, $p < .001$, $\eta_p^2 = .32$. The interaction between participant L1 and accent was not significant, $F(4, 205) = 1.14$, $p = .34$, $\eta_p^2 = .022$.



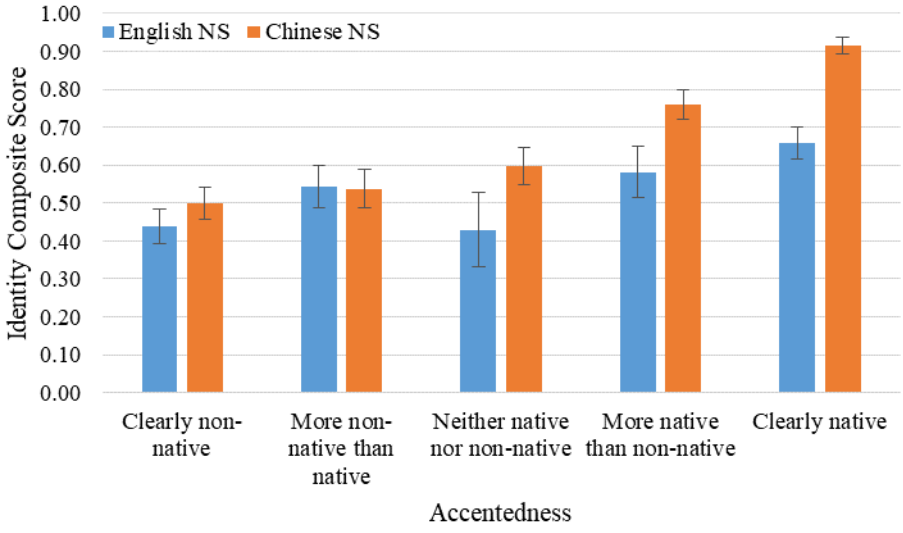
Approachability composite score ranges from 0.20 (low approachability) to 1.00 (high approachability). Error bars represent standard error.

Figure 2. Approachability versus intelligibility and participant L1

3.1.2 Factors influencing identity

To determine the effects of accent and participant L1 on perceived identity, a two-way ANOVA (Table 10 in Appendix G) with fixed factors accent and participant L1 and dependent variable identity composite score was run with an alpha value of .05. The main effect of participant L1 was significant such that English NS (M = .56, SD = .29) considered the speakers less American than Chinese NS (M = .67, SD = .24), $F(1, 204) = 11.0$, $p = .001$, $\eta_p^2 = .055$. The main effect of accent was also significant such that accents rated a 5 "Very native" (M = .74, SD = .26) had the most American identity, followed by 4 "More native than non-native" (M = .68, SD = .23), then by 3 "Neither native nor non-native" (M = .51, SD = .21), 2 "More non-native than native" (M = .54, SD = .26), and 1 "Very non-native" (M = .46, SD = .24), $F(4, 204) = 14.4$, $p < .001$, $\eta_p^2 = .22$. The interaction between participant L1 and accent was marginally significant such that Chinese NS associated accents of 5 "Very native" (M = .92, SD = .09) and 4 "More native than

non-native" (*M* = .76, *SD* = .17) more strongly with American identity than English NS (*M* = .66, *SD* = .28; *M* = .58, *SD* = .26, respectively), $F(4, 204) = 2.29$, $p = .061$, $\eta_p^2 = .043$. These results are shown in Figure 3.

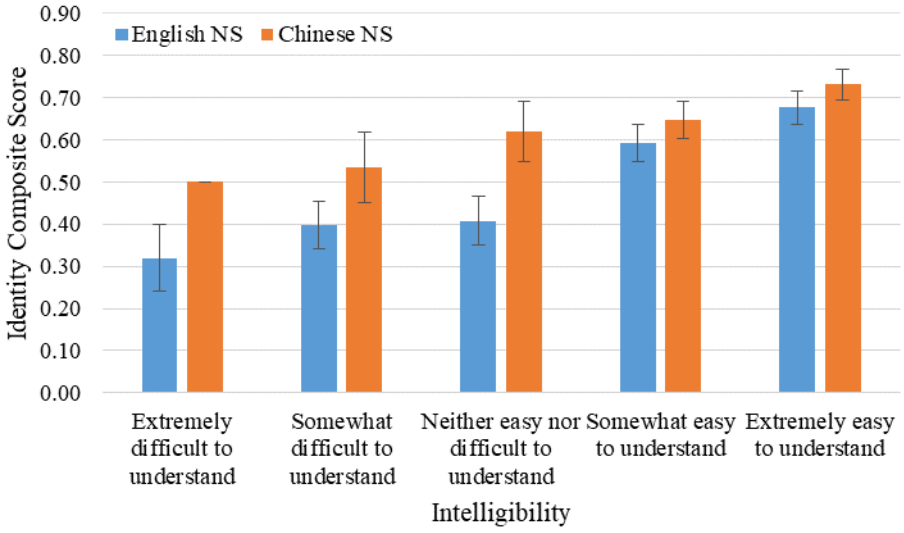


Identity composite score ranges from 0.20 (strong Chinese identity) to 1.00 (strong American identity). Error bars represent standard error.

Figure 3. Identity versus accentedness and participant L1

For the effect of intelligibility on identity, a two-way ANOVA (Table 11 in Appendix G) with fixed factors intelligibility and L1 and dependent variable identity composite score was run with an alpha value of .05. The main effect of participant L1 was significant such that English NS (*M* = .56, *SD* = .29) considered speakers less American than Chinese NS (*M* = .67, *SD* = .24), $F(1, 204) = 4.02$, $p = .046$, $\eta_p^2 = .019$. The main effect of intelligibility was significant such that speakers rated 5 "Extremely easy to understand" (*M* = .70, *SD* = .25) were most American, followed by 4 "Somewhat easy to understand" (*M* = .61, *SD* = .25), 3 "Neither easy nor difficult to understand" (*M* = .50, *SD* = .25), 2 "Somewhat difficult to understand" (*M* = .44, *SD* = .26),

and 1 “Extremely difficult to understand” (M = .35, SD = .19), $F(4, 204) = 6.73$, $p < .001$, $\eta_p^2 = .12$. The interaction between participant L1 and intelligibility was not significant, $F(4, 204) = .69$, $p = .60$, $\eta_p^2 = .013$. These results are shown in Figure 4.



Identity composite score ranges from 0.20 (strong Chinese identity) to 1.00 (strong American identity). Error bars represent standard error.

Figure 4. Identity versus intelligibility and participant L1

3.2 PERCEPTIONS QUESTIONNAIRE

Table 6. Summary of perception of traits

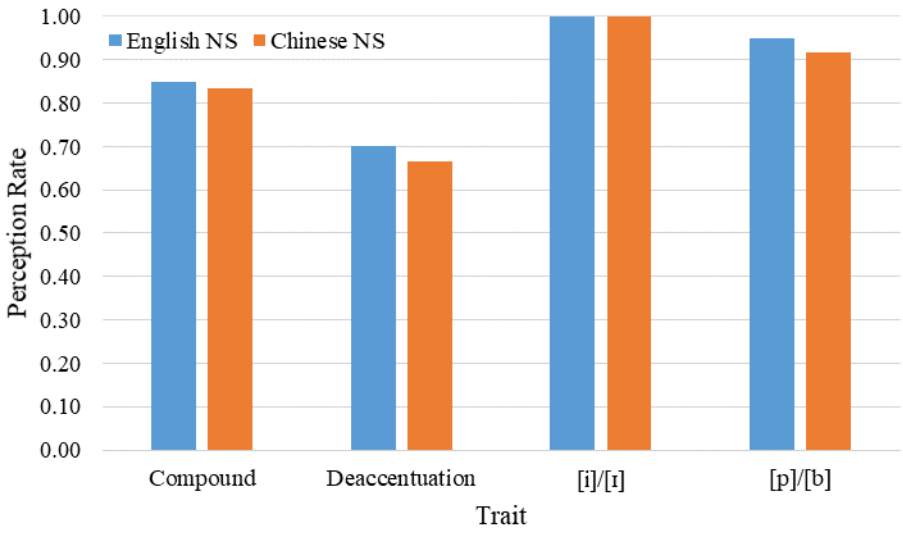
Fixed Factors	Perceive Trait	Explain Meaning	Identify
Trait	n.s.	***	***
Participant L1	n.s.	**	**
Participant L1 × Trait	—	n.s.	**

***$p < .001$. **$.001 \leq p \leq .050$. n.s. = not significant

The perception of the target traits as isolated words and within sentences was compared between Chinese NS and English NS. Overall, perception of the traits did not differ between L1 groups, but both the explanation of the meaning conveyed by the trait and the identification of the trait within sentences were influenced by participant L1. Furthermore, the target traits affected the accuracy of their identification within sentences, and the interaction of trait with participant L1 was significant as well.

3.2.1 Identification of traits in words

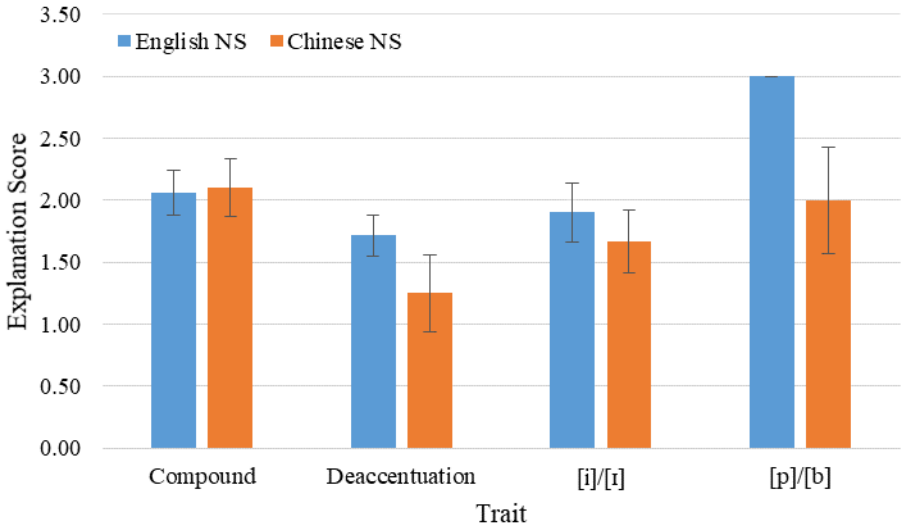
To determine whether perception of the target traits differed between speakers of Chinese and English or by trait, a chi-square test (Table 12 in Appendix G) was performed on a 2 (participant L1) × 2 (perception of the trait) cross-tabulation table. The differences between the two L1 groups was not significant, $\chi^2(1, 32) = .016$, $p = 1.00$ (significance from Fisher's exact test because frequency is less than 5 for two cells). These results are shown in Figure 5, where perception rate is the proportion of participants in each L1 group that correctly perceived the trait.



Perception rate ranges from 0.00 (no participants perceived the trait) to 1.00 (all participants perceived the trait).

Figure 5. Perception of target traits by participant L1

Out of the participants who perceived the target traits, a two-way ANOVA (Table 13 in Appendix G) with alpha-value .05, fixed factors participant L1 and trait, and dependent variable explanation score shows that there is a main effect of participant L1 on explanation such that English NS (M = 2.20, SD = .88) are better at explaining the difference in meaning from the traits than Chinese NS (M = 1.78, SD = 1.04), $F(1, 103) = 5.99$, $p = .016$, $\eta_p^2 = .055$. In addition, there is a main effect of trait such that [p]/[b] differentiation (M = 2.63, SD = .96) was explained best, followed by compounds (M = 2.07, SD = .73), [i]/[ɪ] differentiation (M = 1.81, SD = 1.00), then deaccentuation (M = 1.55, SD = .74), $F(3, 103) = 6.43$, $p < .001$, $\eta_p^2 = .16$. The interaction between participant L1 and trait was not significant, $F(3, 103) = 1.82$, $p = .15$, $\eta_p^2 = .050$. These results are shown in Figure 6.



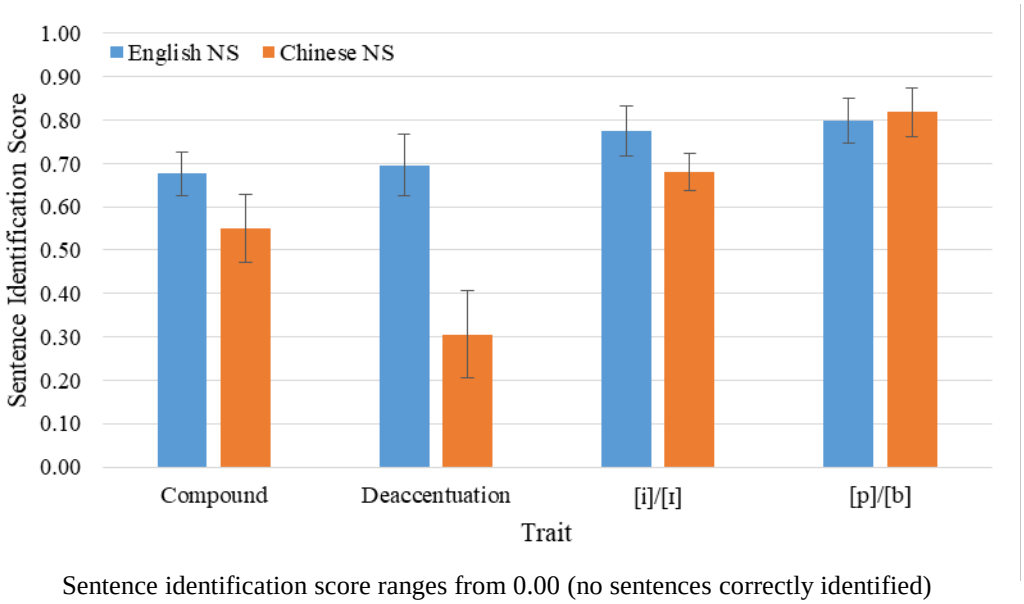
Explanation score ranges from 0.00 (incorrect explanation) to 3.00 (correct explanation). Error bars represent standard error.

Figure 6. Explanation of target traits by participant L1

3.2.2 Identification of traits in sentences

To compare Chinese and English NS' identification of traits within sentences, a two-way ANOVA (Appendix G) with alpha-value .05, fixed factors participant L1 and trait, and dependent variable sentence identification score was run on participants who indicated that they perceived the trait in the isolated words. There was a main effect of L1 such that English NS (M = .74, SD = .24) identified more sentences correctly than Chinese NS (M = .61, SD = .28), $F(1, 104) = 10.4$, $p = .002$, $\eta_p^2 = .091$. The main effect of trait was also significant such that sentences with [p]/[b] differentiation (M = .81, SD = .21) were identified most correctly, followed by [i]/[ɪ] differentiation (M = .74, SD = .23), compounds (M = .63, SD = .23), then deaccentuation (M = .54, SD = .33), $F(3, 104) = 8.15$, $p < .001$, $\eta_p^2 = .19$. As shown in Figure 7, the interaction between L1 and trait was also significant such that sentences with deaccentuation were more

correctly identified by English NS (M = .70, SD = .26) than Chinese NS (M = .31, SD = .30), $F(3, 104) = 3.28$, $p = .024$, $\eta_p^2 = .086$.



Sentence identification score ranges from 0.00 (no sentences correctly identified) to 1.00 (all sentences correctly identified). Error bars represent standard error.

Figure 7. Identification of target traits by participant L1

4.0 DISCUSSION

The present study sought to examine (1) effects of a speaker's accent and intelligibility on their perceived approachability and identity by Chinese and American students and (2) the perception of linguistic traits of Chinese-accented English by Chinese and English native speakers in order to inform an intervention that will facilitate communication between native and non-native English speakers.

4.1 ATTITUDES

4.1.1 Becoming more approachable

As shown in Figure 1, the effect of the listener's native language on the perceived approachability of a speaker is significant but unclear, as is the effect of the interaction between the listener's native language and the perceived accentedness of a speaker. Although speakers who speak most natively are most approachable, the progression to less native-sounding speech is not associated with decreasing approachability. For example, speakers rated somewhat non-native in accent were still considered quite approachable. Furthermore, the direction of the interaction is inconsistent, as Chinese NS find speakers of mid-native accents less approachable than English NS, but English NS find speakers of non-native accents less approachable than

Chinese NS. Thus, a listener's L1 and the accent they perceive are not clear predictors of approachability.

These findings may result from an oversimplified representation of approachability. As many participants shared in interviews, having a shared experience or interest to talk about is more important than accentedness. Because all of the stimuli were about a third-person entity, they may not have provided sufficient information for the participants to determine whether they had common ground with the speaker. The secondary importance of accent was also reflected by responses to questions 4 and 6 in the attitudes questionnaire (see Appendix D) that cited a speaker's enthusiastic tone as an approachable factor.

However, as Figure 2 shows, an increase in intelligibility predicts an increase in approachability, and this effect is not influenced by listener L1 because the interaction between the two variables is not significant. The perceived intelligibility of Chinese NS samples ranged from "Extremely difficult to understand" to "Extremely easy to understand," so this pattern holds for a wide range of intelligibility in Chinese speakers of English. The perceived intelligibility ratings of English NS samples included "Neither easy nor difficult to understand" and "Somewhat easy to understand" in addition to "Extremely easy to understand," so lower intelligibility predicted lower approachability even when the samples' accents were quite standard. Thus, intelligibility is a much clearer predictor of approachability than accentedness.

4.1.2 Issues of identity

However, both accentedness and intelligibility predict the formulation of the speaker's identity. As shown in Figure 3, increasingly native accent predicts an increase in American identity. The marginally significant interaction suggests that Chinese NS tend to associate a native American

English accent more strongly with American identity than an English NS. Figure 4 shows that higher perceived intelligibility also predicts a more American identity, and English NS generally rated speakers as more Chinese-like. Although the interaction between participant L1 and intelligibility was not significant, this difference in L1 is most evident when intelligibility is low. Thus, both accent and intelligibility are clear predictors of identity.

However, within the Chinese community, unusually high English proficiency in speaking, often resulting from frequent interactions with Americans, forms a barrier. As a Chinese NS shared in an interview, spending more time with Americans makes it harder to get to know members of the Chinese community because they are less certain that your cultural identity is Chinese. Furthermore, although high English proficiency is desirable within the community, members worry that highly proficient English speakers look down on them, creating an additional barrier within the group. This is reminiscent of a finding from Bailey's (2000) study on language use in Dominican–American high school students, who did not fully consider a Dominican–American peer as part of their group because her speech was "too white." The results from the attitudes questionnaire suggest that accentedness and intelligibility predict identity for both language groups. In addition, supplemental insights from interviews suggest that it is undesirable in the Chinese community for a member to compromise their Chinese identity by increasing their English proficiency and becoming more native in their speech.

4.2 LINGUISTIC TRAITS

As summarized in Table 6, participant L1 was not a significant predictor of whether the target traits were perceived, but out of the participants who detected the traits, English NS explained

them more fully and identified them more accurately within sentences. As shown in Figure 5, the two participant L1 groups perceived the target linguistic traits at similarly high rates. However, out of these participants, the English NS differentiated the meanings of the words more clearly than the Chinese NS. In addition, the [p]/[b] contrast was explained best within isolated words and deaccentuation explained worst. The worse performance on deaccentuation could be a result of its change in meaning being at the sentence level, not the word level as with the other traits.

The results of the trait identification and explanation in words somewhat mirrors the results for the identification of traits in sentences, though performance on the [i]/[ɪ] contrast was much closer to that of the [p]/[b] contrast in the sentences. Overall, as shown in Figure 6, the performance of English NS improved in the sentences and became fairly uniform across traits, suggesting that sentence context helped English NS' perception. However, this general improvement was not observed in Chinese NS. This is consistent with previous research that context improves English NS' perceptions more than non-native speakers' perceptions (Ortega-Llebaria & Colantoni, 2014). Moreover, Chinese NS performance in the sentences varied more such that suprasegmental traits were identified less accurately than segmental traits. These findings, which suggest that Chinese speakers have a harder time hearing suprasegmental traits than English NS, are consistent with previous research (Gussenhoven, 2014; Ortega-Llebaria et al., 2015) suggesting that a tonal native language influences the perception of second languages with a stress system.

Because the Chinese NS interpret English stress as tone, the rules of tones delineate their perception of stress in English. For example, with deaccentuation, Chinese speakers may not perceive the absence of stress because their native language does not allow for an absence of tone. In the compounds, Chinese speakers may have a more limited representation of the possible

pitch patterns over the target words that make them compound nouns as opposed to modified nouns. Thus, Chinese speakers identified the target traits less accurately than English NS in sentences, especially suprasegmental traits. In addition, as participants noted in interviews, Chinese NS have less experience than English speakers with English, especially in speech because they do not have many opportunities to speak with English NS while learning English, so they may not have known about some target traits. For example, one participant mentioned that, although she heard the deaccentuation in the example during the experiment, she had never before noticed it in speech. Consequently, the Chinese NS' difficulty with suprasegmental traits may also be exacerbated by limited experience.

4.3 DESIGNING AN INTERVENTION

The results from the attitudes and perceptions questionnaires can guide the development of an intervention that will increase communication between Chinese and American students. According to the results of the attitudes questionnaire, approachability of both native and non-native speakers can be increased by improving intelligibility. In interviews, Chinese speakers often cited speed as a source of unintelligibility, so interventions for English NS could address the pace of speech. For Chinese NS, while increasing intelligibility, some markers of Chinese accent should be maintained to avoid compromising Chinese identity, contrary to accent reduction methods (Griffen, 1991 as cited in Munro & Derwing, 1995). Furthermore, because it is easier to address a trait that is perceived, the intervention could focus on the pronunciation of segmentals to improve intelligibility. This would decrease the salience of segmental differences

as markers of foreign accent for English NS (Crowther et al., 2014) but maintain suprasegmental features of accent as markers for Chinese NS.

English NS could also be trained to more easily understand Chinese-accented English. Previous research (Bradlow & Bent, 2003) suggests that exposure and familiarity can increase intelligibility of a foreign accent. In addition, conversing in American English will help Chinese NS become more confident. Several participants noted that, when they first arrived in the U.S., they became nervous whenever they had to speak English because they were not confident in their language skills. This type of combined approach, which places the communicative burden on both the native and non-native speaker, decreases the dominance of the native speaker. Furthermore, it fosters social contact that can decrease prejudices caused by linguistic barriers (Spencer-Rodgers & McGovern, 2002).

4.4 FUTURE DIRECTIONS

This study suggests some guidelines for an intervention to increase communication between Chinese international students and domestic students in the U.S., but there are more factors that should be examined. In the future, a wider variety of American English dialects, including those that are considered to be low-prestige, such as African-American Vernacular English (AAVE), should be included in the speech samples to provide a more complete representation of international students' attitudes toward native American English accents. In interviews, some Chinese participants noted that they preferred the native English accents in the study over the foreign accents since they were easier to understand. Thus, it is important to include more dialects if international students are to be more cohesively integrated with all domestic students,

especially because nonstandard grammar and pronunciation may decrease intelligibility perceived by second-language English learners who learn only standard varieties.

Furthermore, this study focused on a limited set of linguistic traits that were selected for their contribution to perceptions of accentedness, not intelligibility, and it did not investigate the degree to which these specific traits contributed to global perceptions of accentedness and intelligibility within a sentence. Thus, in everyday speech, the traits included in this study may not be the most salient markers of accentedness nor barriers to intelligibility. In the future, the linguistic traits studied in this experiment should be related to intelligibility ratings to determine how they influence intelligibility. In addition, linguistic traits of fluency and grammar, which are more closely related to intelligibility (Crowther et al., 2014), should be considered. In fact, these characteristics were sometimes noted to the exclusion of factors related to pronunciation and word stress in questions 13, 15, and 17 of the attitudes questionnaire by both Chinese and English NS (Appendix D). In addition, because the stimuli in the perceptions questionnaire were scripted, inconsistencies in grammar or fluency may have been less obvious. To study these factors, speech samples may have to be elicited using pictures.

Ultimately, the experiments presented in this study can be expanded to develop language-specific interventions for many immigrant-host language pairs. Increasing mutual intelligibility between speakers will ease intercultural communication, and this social contact will reduce prejudices (Spencer-Rodgers & McGovern, 2002) and promote greater empathy and understanding among people from different language backgrounds in universities and wider communities.

APPENDIX A

CARTOON FOR SPONTANEOUS SPEECH SAMPLES

Figure 8. Cartoon sequence for spontaneous speech samples

APPENDIX B

SENTENCES FOR PERCEPTIONS QUESTIONNAIRE

Sentences in parentheses were not read; they were merely provided to give speakers context.

COMPOUNDS

1. She found a space for her group at the round table yesterday.
2. She nervously prepared for her roundtable discussion.
3. I can't find anything since we moved, have you seen the round table?
4. Are you ready for the conference? How much did you prepare for the roundtable?
5. Her favorite type of bird is the bluebird.
6. While he was at work, his son drew a blue bird.
7. Did you see that bluebird?
8. What do you think about that painting of the blue bird?
9. Please write your answer up on the blackboard.
10. She hid the pencil behind the black board.
11. Could you write your answer up on the blackboard?
12. Have you looked under that black board?

DEACCENTUATION

13. (What's her favorite fruit? Apples?) No, not apples, *oranges* are her favorite fruit.
14. (What are you bringing to the party tonight? Cookies?) No, not cookies, I'm bringing *cake* to the party tonight.
15. (How long is the drive to Pittsburgh from here? Three hours?) No, not three hours, it takes *five* hours to drive to Pittsburgh from here.
16. (Did you say your brother likes watching the cats at the pet store?) No, not my brother, my *sister* likes watching the cats at the pet store.

[i]/[ɪ] DIFFERENTIATION
17. You can catch the bus across the street.
18. Is there a bus stop further down the street?
19. Did you say you live across the street?
20. He threw the ball into the pit.
21. Did your son throw his ball into the pit?
22. Did you say your ball rolled into the pit?

[p]/[b] DIFFERENTIATION
23. There's not enough room in the kitchen for a new table.
24. Did you set the table?
25. When will you set the table?
26. There's not enough space in the yard for another maple.
27. Did you plant the maple?
28. When will you plant the maple?

APPENDIX C

LANGUAGE BACKGROUND QUESTIONNAIRE

1. How long have you lived in the United States? _____

Please list the languages you know, when you learned them, and how you learned them. In addition, please rate your proficiency in reading, writing, speaking, and listening. If you have standardized test scores (e.g., TOEFL, SAT Subject Tests) in any languages, please list those as well.

Example responses:

Language 1: English
When did you learn Language 1?: From birth
How did you learn Language 1?: Native language
Proficiences: Reading, Advanced; Writing, Advanced; Speaking, Advanced; Listening, Advanced
Test scores: N/A

Language 2: French
When did you learn Language 2?: 8th to 12th grade
How did you learn Language 2?: Course in middle and high school
Proficiences: Reading, Intermediate; Writing, Advanced Beginner; Speaking, Advanced Beginner; Listening, Advanced Beginner
Test scores: SAT Subject Test, 720

2. Language 1: _____

3. When did you learn Language 1? _____

4. How did you learn Language 1? _____

5. Please rate your proficiencies in Language 1:

	Beginner	Advanced Beginner	Intermediate	Advanced Intermediate	Advanced
Reading					
Writing					
Speaking					
Listening					

6. If you have test scores for Language 1, please list the test(s) and score(s) here:

_____

7. Now, please take the LexTALE test of English proficiency. Follow the link below, click on "Start the Test", choose the "English" option, and follow the instructions. When you are done, please enter your score in the box below. http://lextale.com/takethetest.html

_____

APPENDIX D

ATTITUDES QUESTIONNAIRE

1. Please rate the speaker's accent:

Very non-native	More non-native than native	Neither native nor non-native	More native than non-native	Very native

2. How easy is it to understand the speaker?

Extremely difficult	Somewhat difficult	Neither easy nor difficult	Somewhat easy	Extremely easy

3. How interested would you be in talking to this person?

Very disinterested	Somewhat disinterested	Neither interested nor disinterested	Somewhat interested	Very interested

4. Why did you choose this rating above? _____

5. How likely would it be to hold an engaging conversation with this person?

Very unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Very likely

6. Why did you choose this rating above? _____

7. How friendly does this person sound?

Very unfriendly	Somewhat unfriendly	Neither friendly nor unfriendly	Somewhat friendly	Very friendly

8. Why did you choose this rating above? _____

9. What language would you use to make a friend with this person?

Definitely Chinese	Probably Chinese	I have no preference	Probably English	Definitely English	Other (please describe)

10. How likely would it be for you to ask this person about a class assignment?

Very unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Very likely

11. Why did you choose this rating above? _____

12. What language would you use to ask this person about a class assignment?

Definitely Chinese	Probably Chinese	I have no preference	Probably English	Definitely English	Other (please describe)

13. What specific features of this person's speech (for example, specific examples of grammar, pronunciation, word choice, etc.) do you particularly like or dislike? Please list specific examples with the reasons you like or dislike them. Feel free to replay the sound file.

    _____

14. Where do you think this speaker is from? Please be as precise as possible while still being accurate. _____

15. What features of speech (for example, specific examples of grammar, pronunciation, word choice, etc.) made you choose your answer above? Please list specific examples with why they made you choose your answer above. Feel free to replay the sound file.

    _____

16. What level of education do you think this speaker has received?

Completed high school	In college (undergraduate)	Holds bachelor's degree	In graduate school	Holds graduate degree	Other (please describe)

17. What features of speech (for example, specific examples of grammar, pronunciation, word choice, etc.) made you choose your answer above? List specific examples with why they made you choose your answer above. Feel free to replay the sound file.

_____

18. Is there anything else you'd like to add?

_____

APPENDIX E

PERCEPTIONS QUESTIONNAIRE

1. Do you hear a difference between the two sounds? __ Yes __ No

2. [*Displayed if "Yes" is answered for question 1*]
   [*Compounds*] Explain how you would define the two words you just heard in the order they were played with a comma in between.
   [*Deaccentuation*] Describe the difference between the two sentences, making sure to specify which sentence corresponds with which description.
   [*Segmentals*] Write the two words you just heard in the order they were played with a comma in between.
   _____

3. [Transcription of sentence with compound targets as a blank or other targets bolded]

   Which of the two sound patterns you heard earlier is used in the blank/the bolded word?

   ___ First ___ Second

4. Please rate the speaker's accent:

Very non-native	More non-native than native	Neither native nor non-native	More native than non-native	Very native

5. How easy is it to understand the speaker?

Extremely difficult	Somewhat difficult	Neither easy nor difficult	Somewhat easy	Extremely easy

APPENDIX F

INTERVIEW QUESTIONS

Chinese speakers

1. Have you noticed any trends or themes in the tasks that you think I'm trying to study? Did you find any parts especially difficult?
2. Out of the languages you speak, do you have preferences for which language to use? Are there specific situations where this might change?
3. Generally, what factors influence your decision on the language you speak when you talk to someone? Why?
4. How do you participate in class?
5. How often do you go to office hours, and for what reasons?
6. Do you think your class participation or attendance at office hours would change if the professor or TA were Chinese?
7. From where or whom else do you seek help if you need it?
8. What are the ethnicities of your friends in your classes? If they speak Chinese, what language do you use to talk to them about class material?
9. What are the ethnicities of your closest friends?
10. Do you feel a stronger connection someone who speaks Chinese versus someone who does not?
11. Do you feel a stronger connection with someone who is Chinese versus someone who is not by virtue of your shared heritage?
12. Do you think you can reliably differentiate between Chinese international students and Chinese-American domestic students?
13. How did you meet your closest friends here?
14. Are you a member of CSSA [Chinese Students and Scholars Association] and/or CASA [Chinese-American Student Alliance]?
15. Is there anything else you'd like to talk about?

English speakers

1. Have you noticed any trends or themes in the tasks that you think I'm trying to study? Did you find any parts especially difficult?
2. What kinds of interactions do you regularly have with speakers of nonstandard English, be they foreign or regional accents?
3. Do you notice any changes in your own behavior, either as a speaker or a listsener, when you talk with them?
4. What sorts of clubs, activities, or work are you involved in?
5. Do you feel that you can reliably differentiate between international and domestic students? How?

Is there anything else you'd like to talk about?

APPENDIX G

RESULTS OF STATISTICAL ANALYSES

Table 7. Effects of participant L1, accentedness, and identity on approachability

Fixed Factors	*df*	*F*	*p*	η_p^2
Participant L1	1	.656	.420	.006
Accentedness	4	3.856	.006	.121
ID score	25	1.526	.071	.254
Participant L1 × Accentedness	3	2.493	.064	.063
Participant L1 × ID score	16	1.240	.249	.150
Accentedness × ID score	45	.968	.538	.280
Participant L1 × Accentedness × ID score	5	2.075	.074	.085

ID score is the identity composite score.

Table 8. ANOVA of accentedness and L1 on approachability

Fixed Factors	*df*	*F*	*p*	η_p^2
Participant L1	1	1.105	.294	.005
Accentedness	4	9.758	.000	.160
Participant L1 × Accentedness	4	4.164	.003	.075

Table 9. ANOVA of intelligibility and L1 on approachability

Fixed Factors	*df*	*F*	*p*	η_p^2
Participant L1	1	.003	.959	.000
Intelligibility	4	24.372	.000	.322
Participant L1 × Intelligibility	4	1.136	.341	.022

Table 10. ANOVA of accentedness and L1 on identity

Fixed Factors	*df*	*F*	*p*	η_p^2
Participant L1	1	11.878	.001	.055
Accentedness	4	14.373	.000	.220
Participant L1 × Accentedness	4	2.290	.061	.043

Table 11. ANOVA of intelligibility and L1 on identity

Fixed Factors	*df*	*F*	*p*	η_p^2
Participant L1	1	4.018	.046	.019
Intelligibility	4	6.732	.000	.117
Participant L1 × Intelligibility	4	.687	.601	.013

Table 12. Perception of traits in words by L1

Test	Value	*df*	Asymptotic Significance	Exact significance
Pearson Chi-Square	.016	1	.900	—
Fisher's Exact Test	—	1	—	1.000

Table 13. ANOVA of trait and L1 on identification in sentences

Fixed Factors	*df*	*F*	*p*	η_p^2
Participant L1	1	10.354	.002	.091
Trait	3	8.148	.000	.190
Participant L1 × Trait	3	3.281	.024	.086

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