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Testing the Relationship Between Dialect Density and Social Interaction

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TESTING THE RELATIONSHIP BETWEEN DIALECT DENSITY AND SOCIAL INTERACTION

A Capstone Experience/Thesis Project
Presented in Partial Fulfillment of the Requirements for
The Degree Bachelor of Science with
Honors College Graduate Distinction at Western Kentucky University

By:
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2018

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ABSTRACT

With over 1300 international students from more than 70 countries, Western Kentucky University prides itself on being a diverse, welcoming community. However, many international students have a tendency to associate with other international students with similar dialects rather than with English-speaking students from the United States. This research explores the relationship between dialect density (how strongly a dialect or accent is expressed) and social interaction of individuals from the international student population on Western Kentucky University’s campus. Results revealed that the international students who had the mildest self-perceived dialect density had high self-perceived social interaction scores. Results also indicated that the international students who felt most comfortable interacting with American English speakers were also the students who indicated the most social interaction with them. These results suggest that social interaction with native speakers is primarily dependent on personal confidence and comfortability, rather than on objective features of speech such as rate and dialect density. Further research is needed to determine how dialect density and other factors may create communication barriers between native and nonnative speakers.

Keywords: International Students, Dialect, Accent, Communication, Social Interaction
Dedicated to my advisors, Dr. Janice Smith and Dr. Leigh Anne Roden-Carrier, and to all of the parties at WKU who made this project possible. To the Mahurin Honors College for always supporting my big dreams. To my parents, Jackie and Kevin, for believing in my ability to change the world. Lastly, to all the international students at WKU for making our university such a culturally diverse community for educational growth.
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I would like to thank Mahurin Honors College at WKU for building such a supportive academic community. Thanks to the WKU International Student Office for their help in recruiting international students. Many thanks for the international student volunteers, without whom, this research project would not have been possible.

Finally, I would like to thank my friends and family. Their constant support gave me the confidence and dedication necessary to complete this research project.

“Philippians 4:13.”
VITA

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CHAPTER 1

INTRODUCTION & RELATED LITERATURE
We live in an increasingly global world. As technology advances, travel and immigration have become easier and easier. Although immigration is increasing worldwide, public attitudes toward immigrants and immigration in any given country are mostly negative. People often perceive others from foreign countries as less trustworthy and less intelligent (Kessler & Freeman, 2005). People from other countries are discriminated against because of their physical appearance, cultural practices, or dialect. Prejudice and stereotyping do not always result in overt behaviors, such as bullying, refusing services, and direct verbal insults. However, the behavioral effects of prejudice and stereotyping based on dialects are pervasive (Biernat & Dovidio, 2000). Research has indicated that anxiety, stress, and social interaction problems are often caused by stereotypes and stigmas. A “stigma” refers to an attribute of a person that “conveys a social identity that is devalued in a particular social context” (Crocker, Major, & Steele, 1998, p. 505).

Dialects are one of the main ways people determine if an individual is from another country. Individuals frequently learn to speak a nonnative language fluently, but typically retain the phonology and intonation of their first language (Derwing & Munro, 2009). Listeners are highly sensitive to phonetic, phonological, and prosodic variations in speech and use the information provided by dialects to make important social judgments about the speaker (Dailey, Giles, & Jansma, 2005). Dialects can provide information
about the speaker's geographical, socioeconomic, and ethnic background (Bestelmeyer, Belin, & Ladd, 2015). Nonnative dialects carry a negative stigma in the United States as well as in other countries. Second language speakers have been shown to suffer serious detrimental social, political, financial, and legal consequences due solely to their foreign accents (Kinzler, Shutts, DeJesus, & Spelke, 2009).

The stigma surrounding nonnative dialects may have a huge effect on the speaker’s social interaction with those with native dialects. Derwing (2003) argued that individuals who expect to be stigmatized based on their nonnative dialect may be more likely to avoid situations in which they think they may experience discrimination, be less likely to initiate conversations, and attribute any problems in communication to the listener’s prejudices. Stronger dialects are linked to a lower sense of belonging because these accents are perceived by speakers as a greater barrier to successful communication. Communication challenges associated with possessing a nonnative dialect may affect the social initiatives, perceptions, and adjustment of nonnative speakers (Gluszek & Dovidio, 2010).

Numerous studies on native accent bias have been conducted over the past few decades. Kinzler, Dupoux, and Spelke (2007) found that preference for one’s own accent emerges in babies as early as 5 months. Accent bias may also be shaped by the media. Disney movies, for example, disproportionately use foreign accents in a negative way as
compared to American accents (Lippi-Green, 1997). A study conducted by Bestelmeyer et al. (2015) even found a neural marker in the brain for the bias associated with accents. “Repetitions of the participant's own accent were associated with increased activation in bilateral amygdalae, right rolandic operculum, and anterior cingulum, while repetitions of the other group's accent showed decreased activations in these regions,” (Bestelmeyer et al., 2015, p. 3956). The neural activation patterns present when participants listened to speakers with accents similar to their own showed remarkable resemblance to activations in response to pleasant music and vocal affect (Bestelmeyer et al., 2015).

Despite brain responses similar to those of listening to nice music, research has shown there is nothing inherent to accents that makes some more aesthetically pleasant than others; rather, accents serve as cues to social identities, often activating negative connotations (Edwards, 1999). Milroy and McClenaghan (1977) argued that listeners do not need to correctly identify the accent of a speaker to make stereotypical judgments. For example, Korean accents are only correctly identified in the United States (U.S.) 8% of the time, yet Korean immigrants are still discriminated against based on their accents (Lindemann, 2003). Pantos and Perkins (2012) state that “…foreign is a salient and meaningful out-group category for listeners irrespective of nationality attributions” (p. 12). They found that participants’ implicit attitudes or immediate reactions consistently showed a pro-U.S. accent bias.
Research has not only explored what creates accent bias, but how accent bias, accents, and dialects affect communication. It remains unclear whether prejudice or perceived and actual problems in comprehension exert the most influence on the listener’s behavior toward the speaker (Gluszek & Dovidio, 2010). However, it is clear that both stigmas surrounding nonnative speakers and dialect density can influence social interaction. Both negative attitudes and issues with dialects’ comprehensibility are linked with disruptiveness, or the extent to which a characteristic interferes with interpersonal interactions (Crocker et al., 1998).

Dialects usually influence one’s degree of intelligibility, or overall assessment of how well a speaker can make oneself understood (Subtelny, Whitehead, & Orlando, 1980). When intelligibility is low, negative attitudes and responses are primed. More intelligible accents are associated with more positive affective responses from listeners (Bresnahan, Ohashi, Nebashi, Liu, & Shearman, 2002). If a speaker’s dialect is particularly unintelligible, a listener may over accommodate to his/her speech. When using “…‘foreigner talk’…” the listeners “…‘help’ foreigners to understand by using a simplified—and unknown (often incomprehensible)—version of their language, frequently accompanied by exaggerated intonation and loud volume,” (Gallois, Ogay, & Giles, 2005, p. 141). Conversely, some listeners may not put any effort into
understanding or accommodating to a speaker with strong dialect density (Derwing, 2003).

There are many factors that can contribute to dialect density. Gumperz (1958) found that the distribution of a speaker’s dialect differences was determined by social as well as geographical factors, including his native language, the age he began learning the nonnative language, the time he has spent in the nonnative country, and his identification with the nonnative country. Gluszek, Newheiser, and Dovidio (2011) also found that identification with the U.S. relative to one’s native culture predicted dialect strength; stronger identification with American culture predicted weaker self-reported and other-perceived dialects. People who exhibit stronger dialects are also perceived to identify more strongly with their ethnic group (Gatbonton, Trofimovich, & Magid, 2005). Some people may want to keep their dialects as a signal to listeners of their linguistic background and cultural identity (Szabo, 2006). Others may modify their dialects either to distinguish themselves from out-group members or to fit in with in-group members.

A person’s nonnative accent not only has immediate effects on the outcome of a given conversation, but also has far-reaching influences on both the speaker and the listener. Everyday interactions become part of a person’s past experiences, attitudes, and beliefs and influence how he or she approaches future conversations (Gallois et al., 2005). Speakers are likely to use feedback from listeners to form an impression of their
own accents (Gluszek et al., 2011). Those who find their accents particularly strong may avoid interactions with native English speakers or find such interactions more anxiety provoking and resource depleting (Derwing & Rossiter, 2002). Research has primarily focused on how dialects are perceived by others as opposed to the speaker’s own perception of his or her dialect. No studies have examined how speakers’ judgements of their own dialect density affect their interaction with others who have standard dialects (Gluszek & Dovidio, 2010). One goal of this study is to further examine the impact of nonnative speakers’ perceptions of their own dialect density on their social interaction with native-born American English speakers.

While research has begun exploring how accents and dialects affect communication, more thorough research is needed to determine which specific elements of accents and dialects contribute the most to communication breakdowns. Gluszek, Newheiser, and Dovidio (2011) state that a better understanding of the factors that contribute to accents—accent strength specifically—and a greater appreciation of the potential social consequences of speaking with a nonnative accent can help expand knowledge regarding accent bias and communication breakdowns. Gumperz (1958) argues that the most important differences of speech within a community are due to differences in the density of dialects and communication. The aim of this study is to explore how many different qualities of dialects, including dialect density, rate of speech,
phonetic deviation, and mean length of utterances, affect social interaction. “It is important to examine social interrelations among different variables and how each variable, along with others, may affect the psychological processes associated with speaking with a nonnative accent,” (Gluszek et al., 2011, p. 37).

The primary purpose of this study is to explore how dialects of international students affect social interaction. Numerous studies on dialects and communication have been conducted, but very few target the population of international students. Many students across the world choose to pursue academic studies in foreign countries in order to expand their knowledge and possible career opportunities. Studying abroad can present many challenges, such as language difficulties, communication breakdowns with faculty and peers, stress, anxiety, loneliness, financial hardships, and culture shock (Wu, Garza, & Guzman, 2015). Difficulty communicating and interacting with native-born students is one of the most common issues international students face.

Across the United States, there is a general lack of receptivity for foreign-accented English on college campuses (Bresnahan et al., 2002). For example, in a study conducted by Rubin and Smith (1990), 40% of undergraduates reported they preferred to avoid classes taught by foreign teaching assistants. This avoidance occurs not only in classroom settings, but also social ones. Some students avoid interacting with international students because they are labeled as less intelligent because of their dialects.
Additionally, international students often avoid contact with host nationals because of fear and embarrassment (Fussman, 2016).

With over 1300 international students from more than 70 countries, Western Kentucky University prides itself on being a diverse, welcoming community. However, at Western Kentucky University, as at most colleges, many of the international students seem to associate more with other international students than with English-speaking U.S. students. Using surveys and interviews with individuals from the international student population on Western Kentucky University’s campus, this project tests the relationship between social interaction and dialect density, or how strongly a dialect or accent is expressed. The project’s aim is to investigate the need for new ways to expand social interaction between native English-speaking students and international students at Western Kentucky University.
CHAPTER 2

METHODOLOGY
The purpose of this project is to explore the various qualities that contribute to dialect density and their relationship with one’s level of social interaction, specifically amongst international students. This study was conducted at Western Kentucky University (WKU), a college known for its international reach, with students from over 70 different countries. For this study, 16 students were interviewed from 10 different countries, including Saudi Arabia, India, Vietnam, Beliz, Brazil, China, and Nigeria. Students were selected based on the following inclusion criteria:

1. Subjects must be between the ages of 18:0-30:11.
2. Subjects must have been born and raised, at least 15 years, outside of the U.S.

Students were contacted through flyers, word-of-mouth, and emails via the WKU International Student Office. The primary investigator set up a time to meet with each student one-on-one. All interviews took place on campus and lasted under 30 minutes. At each interview meeting, participants were video recorded reading “The Caterpillar” passage aloud. “The Caterpillar” passage is a phonetically balanced, paragraph-long story provided by the American Journal of Speech-Language Pathology that is used for phonetic analysis. “The Caterpillar” passage reads as follows:

“Do you like amusement parks? Well, I sure do. To amuse myself, I went twice last spring. My most MEMORABLE moment was riding on the Caterpillar, which is a gigantic roller coaster high above the ground. When I saw how high the
Caterpillar rose into the bright blue sky I knew it was for me. After waiting in line for thirty minutes, I made it to the front where the man measured my height to see if I was tall enough. I gave the man my coins, asked for change, and jumped on the cart. Tick, tick, tick, the Caterpillar climbed slowly up the tracks. It went SO high I could see the parking lot. Boy was I SCARED! I thought to myself, “There’s no turning back now.” People were so scared they screamed as we swiftly zoomed fast, fast, and faster along the tracks. As quickly as it started, the Caterpillar came to a stop. Unfortunately, it was time to pack the car and drive home. That night I dreamt of the wild ride on the Caterpillar. Taking a trip to the amusement park and riding on the Caterpillar was my MOST memorable moment ever!” (Patel, Connaghan, Franco, Edsall, Forgit, Olsen, & Russell, 2013, p. 2).

In addition to “The Caterpillar” passage, a conversational sample with principal investigator was videotaped (see Appendix B for the Interview Question Outline). Using a scripted speech sample and natural conversation helped provide a more complete picture of each student’s dialectal features.

Lastly, each student was given a ten-question survey (see Appendix D), asking about his/her social interaction. Questions touched on the cultural norms of communication where each student was from and how each views his/her own dialect. Time spent interacting with English-speaking American students and the quality of these interactions...
interactions was addressed. Results from this survey were used to calculate each student’s self-perceived level of social interaction.

After all interviews were completed, transcriptions of each interview conversation were typed out and analyzed using Systematic Analysis of Language Transcriptions (SALT) software (2015). SALT is software used to manage the process of eliciting, transcribing, and analyzing language samples. SALT software was used to determine each student’s type token ratio (TTR), number of bound morphemes, variety of bound morphemes, and mean length utterance (MLU). Responses to the interview questions were used to determine each student’s self-perceived dialect density and level of comfort interacting with American English speakers.

“The Caterpillar” passage recordings were used to calculate each student’s average rate of speech or words per minute, which was then compared to the average rate of General American English (GAE) speech to determine the deviation. The International Phonetic Alphabet was used to transcribe portions of each student’s reading of “The Caterpillar” passage. These phonetic transcriptions were then compared to the GAE phonetic pronunciations in order to calculate phonetic variation.

Each of these variables (TTR, MLU, number of bound morphemes, variety of bound morphemes, self-perceived dialect density, level of comfort, phonetic difference, rate, and deviation from GAE rate) was then compared to each student’s self-perceived
social interaction, using scatter plot graphs. These graphs revealed which variables were correlated with social interaction and to what extent.

Lastly, each international student’s dialect density was calculated using the Levenshtein Distance method, one of the most common measuring tools used for calculating dialect strength. Results are summarized in Chapter 3.
CHAPTER 3

RESULTS
Each international student filled out a 10-question survey (see Appendix D). Each question asked him/her to rank how often he/she interacted with English-speaking United States (U.S.) students in various situations, such as during meal times, at work, or on the phone. One was selected if he/she never interacted with English-speaking U.S. students in the given situation. Ten was selected if he/she always interacted with English-speaking U.S. students in the given situation. Numbers between 1 and 10 were selected based on how much he/she interacted with English-speaking U.S. students vs. other international students in the given situation.

Each survey was totaled up and divided by the number of questions to give a score out of 10, with 10 being the most possible social interaction with English-speaking U.S. students. The scores were used to compare each speaker’s self-perceived social interaction with various factors such as his/her rate of speech and phonetic deviation. The highest self-perceived level of social interaction with English-speaking U.S. citizens in this study was an 8.9. The lowest level was a 3.8. The complete list of self-perceived social interaction scores is shown in Table 1:
### Table 1

*Self-Perceived Social Interaction Scores Table*

<table>
<thead>
<tr>
<th>Participants</th>
<th>SP-SI Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Student 1</td>
<td>5.4</td>
</tr>
<tr>
<td>International Student 2</td>
<td>3.8</td>
</tr>
<tr>
<td>International Student 3</td>
<td>6.5</td>
</tr>
<tr>
<td>International Student 4</td>
<td>8.5</td>
</tr>
<tr>
<td>International Student 5</td>
<td>4.8</td>
</tr>
<tr>
<td>International Student 6</td>
<td>4.4</td>
</tr>
<tr>
<td>International Student 7</td>
<td>8.4</td>
</tr>
<tr>
<td>International Student 8</td>
<td>7.6</td>
</tr>
<tr>
<td>International Student 9</td>
<td>7.8</td>
</tr>
<tr>
<td>International Student 10</td>
<td>8.9</td>
</tr>
<tr>
<td>International Student 11</td>
<td>6.4</td>
</tr>
<tr>
<td>International Student 12</td>
<td>7.4</td>
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<tr>
<td>International Student 13</td>
<td>8.0</td>
</tr>
<tr>
<td>International Student 14</td>
<td>4.5</td>
</tr>
<tr>
<td>International Student 15</td>
<td>4.0</td>
</tr>
<tr>
<td>International Student 16</td>
<td>7.1</td>
</tr>
</tbody>
</table>
Each international student was interviewed, following a 13-question outline (Appendix B). Each student’s level of comfort interacting with American English speakers was reported based on his/her response to Question 10. Question 10 read, “On a scale of 1-100, with 1 being not comfortable at all and 100 being completely comfortable, how comfortable do you feel interacting with English speakers from the U.S.?” Each student’s level of comfort was plotted against his/her self-perceived social interaction score as seen in Figure 3.1.

**Figure 3.1** This figure shows the relationship between self-perceived social interaction and level of comfort interacting with American English speakers.
The final question of the interview asked participants to classify their own accents as Mild-1, Moderate-2, or Strong-3. These self-perceived dialect density ratings were plotted against the self-perceived social interaction scores as shown in Figure 3.2.

Figure 3.2 This figure shows the relationship between self-perceived social interaction and self-perceived dialect density.
Transcriptions of each interview were entered into the Systematic Analysis of Language Transcriptions (SALT) software (2015). The SALT software calculated each international student’s type-token ratio (TTR). Type-token ratio is a measure of vocabulary variation within a person’s speech. It can be used to measure lexical variety among individuals. The total number of words in a transcription is often referred to as the number of tokens. However, many tokens are repeated multiple times. The number of different words in a transcription is referred to as the number of types. To calculate TTR, the number of types is divided by the number of tokens. A high TTR indicates a large amount of lexical variation and a low TTR indicates relatively little lexical variation. A high TTR can be a sign of a strong understanding of a second language.

Each international student’s type-token ratio was plotted against his/her self-perceived social interaction score as shown in Figure 3.3.
Figure 3.3 This Figure shows the relationship between self-perceived social interaction and type-token ratio.
The SALT software was also used to calculate each international student’s mean length utterance or MLU. MLU is a measure of the average length of one’s utterances in morphemes. MLU scores are similar to average sentence length scores, but MLU scores look at every utterance, not just full sentences, and count every morpheme, not just full words. A morpheme is the smallest element in a language capable of creating a difference in meaning. Morphemes include prefixes, roots, and suffixes. MLU is calculated by adding up the total number of morphemes used and dividing it by the number of utterances. A higher MLU score can indicate a better understanding of the language.

The MLU scores for the international students were plotted against their self-perceived social interaction scores in Figure 3.4.
Figure 3.4 This figure shows the relationship between self-perceived social interaction and mean length utterance.
MLU scores give the average number of morphemes a person uses in an utterance. Both free and bound morphemes are counted when totaling the number of morphemes in an utterance. A free morpheme is the smallest grammatical unit that carries meaning and can stand alone. A bound morpheme, on the other hand, appears only as part of a larger word. Bound morphemes are usually prefixes and suffixes. Knowing how to accurately apply bound morphemes such as verb endings, plurals, and possessives requires a certain level of mastery of a language. The greater the number of bound morphemes, the greater the understanding of the language.

The SALT software was used to calculate the number of bound morphemes each international student used throughout his/her interview conversation. Each student’s number of bound morphemes was plotted against his/her self-perceived social interaction in Figure 3.5.
Figure 3.5 This figure shows the relationship between self-perceived social interaction and the number of bound morphemes.
The variety of bound morphemes each international student used in the interview conversation was also calculated using the SALT software. A list of each bound morpheme and how many times it was used was generated. A wider variety of bound morphemes used shows a wider understanding of how to apply prefixes and suffixes in a given language. The number of different bound morphemes each participant used was totaled and plotted against his/her self-perceived social interaction score in Figure 3.6.

**Figure 3.6** This figure shows the relationship between self-perceived social interaction and variety of bound morphemes.
Each international student’s rate was calculated using his/her reading of “The Caterpillar” passage. Speech rate was measured in words per minute or WPM. To calculate each student’s speech rate, the total number of words in the passage (196) was divided by however many minutes it took him/her to finish reciting the paragraph.

“Increasing articulation rate usually leads more to a decreased exactness of articulatory movements,” (Schelten-Cornish, 2007, 137). Because of this, it was hypothesized that those who speak with a faster rate may be harder to understand and therefore may interact with native speakers less. Each participant’s speech rate was plotted against his/her self-perceived social interaction score as shown in Figure 3.7.
Figure 3.7 This figure shows the relationship between self-perceived social interaction and speech rate.
The average speech rate of General American English (GAE) was determined to be around 160 words per minute (Schelten-Cornish, 2007). To calculate deviation from the average speech rate of General American English, each student’s speech rate was subtracted from 160 or vice versa. Deviations ranged from 1 WPM to 67 WPM deviations. Each student’s deviation from GAE rate was plotted against his/her self-perceived social interaction score in Figure 3.8.

Figure 3.8 This figure shows the relationship between self-perceived social interaction and deviation from the average speech rate of General American English.
Eight words from *The Caterpillar* passage were selected and transcribed using the International Phonetic Alphabet (IPA). Standard GAE spellings of each word are written in the second row of the following table. IPA transcriptions of each international student’s pronunciations of these selected words are in the following 16 lines. To calculate phonetic difference, each IPA transcribed word was given a score. If the transcription matched the GAE spelling, it was given a 0 for no phonetic differences. If there was only one major phonetic difference from the GAE spelling, the transcribed word was given a score of 1. If there were two or more phonetic differences from the GAE spelling, the transcribed word was given a score of 2. Scores other than zero are written next to the transcribed word they refer to. The last column shows the total number of phonetic differences each student had.
Table 2

Phonetic Differences Table

<table>
<thead>
<tr>
<th>Word:</th>
<th>amusement</th>
<th>memorable</th>
<th>caterpillar</th>
<th>gigantic</th>
<th>rollercoaster</th>
<th>amuse</th>
<th>thirty</th>
<th>scared</th>
<th>Tot</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAE /smjuʒmɑnt/</td>
<td>/mɛmɑrəbol/</td>
<td>/kætərpɪlar/</td>
<td>/dʒɑʊəntɪk/</td>
<td>/rʊlərkoʊˈɔsteər/</td>
<td>/smjuʒ/</td>
<td>/θərdi/</td>
<td>/skɛrd/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPA trans.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IS 1 /smjuʒ/</td>
<td>/mɛmɑrəbol/</td>
<td>/kætərpɪlar/</td>
<td>/gɡəɡɛntɪk/</td>
<td>/rʊlərkoʊˈɔsteər/</td>
<td>/sʊm/</td>
<td>/θərdi/</td>
<td>/skɛrd/</td>
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<td>/dʒɑʊəntɪk/</td>
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<td>/skɛrd/</td>
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<td>/emjuʒ/</td>
<td>/θərdi/</td>
<td>/skɛrd/</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Note: Phonetic difference scores above 0 are in boldface. GAE= General American English; IPA=International Phonetic Alphabet; IS= International Student; trans= transcriptions; tot= total number of phonetic differences.
Phonetic differences are a strong indicator of intelligibility or how easily understood one’s speech is. It was hypothesized that those with the most phonetic differences would be the most unintelligible and therefore may interact with native speakers less. Each student’s phonetic difference total was plotted against his/her self-perceived social interaction score in Figure 3.9.

**Figure 3.9** This figure shows the relationship between self-perceived social interaction and phonetic difference.
The Levenshtein Distance is one of the most common measuring tools used for calculating dialect density. The Levenshtein Distance is a measure of string distance that has been applied to problems in speech recognition for over twenty years. The Levenshtein Distance was applied to Irish Gaelic dialects in 1995 and has been used in numerous studies on dialects from around the world since (Kessler, 1995). Wieling, Bloem, Mignella, Timmermeister, and Nerbonne (2013) found that the Levenshtein distance is qualified to function as a measurement of "native-likeness" in studies on foreign dialects.

A Levenshtein Distance calculator was used to determine the scores of each participant’s transcriptions. If the student pronounced the word exactly as it would be pronounced in General American English, he/she was given a score of zero. Scores above zero, based on Levenshtein Distance, are written to the right of each transcription. Each student’s scores are totaled in the final column of Table 3 to determine his/her dialect density.
### Table 3

**Dialect Density (D.D.) Table**

<table>
<thead>
<tr>
<th>Word:</th>
<th>amusement</th>
<th>memorable</th>
<th>caterpillar</th>
<th>gigantic</th>
<th>rollercoaster</th>
<th>amuse</th>
<th>thirty</th>
<th>scared</th>
<th>D.D.</th>
</tr>
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<tbody>
<tr>
<td>GAE IPA trans.</td>
<td>/əmjuzmənt/</td>
<td>/mrmərəbol/</td>
<td>/kətərpələr/</td>
<td>/dʒaɪəgentɪk/</td>
<td>/rʊələrkoʊstər/</td>
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<td>/θɔrdi/</td>
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</tr>
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<td>/dʒaɪəgentɪk/</td>
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<td>/mrmərəbol/</td>
<td>/kətərpələr/</td>
<td>/dʒaɪədʒəntɪk/</td>
<td>/rʊələrkoʊstər/2</td>
<td>/əmjuz/</td>
<td>/θɔrti/</td>
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<td>/dʒaɪəgentɪk/</td>
<td>/rʊələrkoʊstər/</td>
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<td>/θɔrdi/</td>
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<td>IS 6</td>
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<td>/dʒaɪəgentɪk/</td>
<td>/rʊələrkoʊstər/</td>
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<td>/əmjuz/</td>
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<td>/skrɛd/</td>
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<td>/əmjuz/</td>
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<td>/skrɛd/</td>
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<td>/rʊələrkoʊstər/</td>
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<td>/θɔrdi/</td>
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<td>IS 13</td>
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</table>

*Note: Phonetic difference scores above 0 are in boldface. GAE= General American English; IPA=International Phonetic Alphabet; IS= International Student; trans= transcriptions; D.D.= Dialect Density.*

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Each participant’s dialect density score was plotted against his/her self-perceived social interaction score as shown in Figure 3.10.

**Figure 3.10** This figure shows the relationship between self-perceived social interaction and dialect density.
CHAPTER 4

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH
It was hypothesized that dialect density, as well as many of its contributing qualities such as phonetic difference and rate, would show a statistically significant relationship with self-perceived social interaction. However, the results of this study suggest that objective features such as type-token ration and phonetic variation, have very little impact on social interaction with native speakers. Results of this study did reveal a relationship between self-perceived social interaction and level of comfort interacting with native speakers, as well as between self-perceived social interaction and self-perceived dialect density, implying that social interaction with native speakers is primarily dependent on personal confidence and subjective qualities.

The scores from the survey in Table 1 indicate that none of the interviewed international students completely avoided social interaction with English-speaking American students. However, most participants ranked in the 4-7 range, meaning they interact with international students nearly the same amount as they interact with English-speaking American students, despite the fact that international students only make up about 5% of the student population at Western Kentucky University. If international students interacted with American students and international students proportionately, the scores would have all been around 9.5. The scores clearly show that interaction with English-speaking American students is an issue and that international students interact disproportionately with other international students.

Using results from the survey, the relationship between self-perceived social interaction (SP-SI) and the level of comfort interacting with American English speakers
was shown in Figure 3.1. With the exception of four outliers, the graph shows a positive relationship between self-perceived social interaction and level of comfort interacting with American English speakers. This indicates that the international students who feel most comfortable with native speakers are also the ones who interact with native speakers the most. One’s level of comfort directly affects their level of social interaction. More research is needed to determine what affects international students’ levels of comfort. If we find a way to increase levels of comfort when interacting with native speakers, it would follow that social interaction with native speakers would also increase.

Each international student’s ranking of their own dialect density was used in Figure 3.2. The graph shows a slight relationship between self-perceived social interaction and self-perceived dialect density. This indicates that an international student’s perception of his/her own dialect strength does have an impact on how much he/she interacts with native speakers. Seven of the participants who scored above 6 on the social interaction survey also ranked their accents as Mild-1, suggesting that self-perceived dialect density may influence one’s social interaction with native speakers. More research is needed to determine what shapes one’s opinion of their own dialect density.

SALT software (2015) was used to calculate the each student’s type-token ratio shown in Figure 3.4. This graph shows no relationship between self-perceived social interaction and type-token ratio. Almost all international students had TTRs around .4 and .5, no matter how high or low their self-perceived social interaction scores were. This
suggests that the size of one’s vocabulary in a second language does not affect their social interaction.

Figure 3.4 shows a slight relationship between self-perceived social interaction and mean length utterance. These results suggest that international students who use longer utterances are slightly more likely to interact with native speakers than those who use shorter utterances.

With the exception of four outliers, Figure 3.5 shows a positive relationship between the number of bound morphemes and self-perceived social interaction. This could imply that the more an international student understands a second language and use of its bound morphemes, the more they interact with native speakers. However, Figure 3.6 shows very little connection between the variety of bound morphemes and self-perceived social interaction, implying that one’s understanding of bound morphemes in a second language may not have a significant impact on how much he/she interacts with native speakers after all.

Each international student’s speech rate was calculated in words per minute and plotted against SP-SI in Figure 3.7. The graph shows little relationship between rate and self-perceived social interaction, meaning that how fast or slow an international student speaks does not influence how much he/she interacts with native speakers. These results are reinforced in Figure 3.8, which shows no relationship between deviation from GAE
speech rate and self-perceived social interaction. How much faster or slower one speaks than a General American English speaker does not appear to impact social interaction. An international student’s rate of speech is not connected with how much he/she interacts with American speakers.

Using the IPA transcriptions from Table 2, Figure 3.9 was constructed to show the relationship between phonetic difference and self-perceived social interaction. Contradicting the hypothesis, Figure 3.9 revealed little relationship between phonetic difference and SP-SI. This implies that one’s intelligibility may have much less of an impact on social interaction than originally thought. Just because an international student interacts more with native speakers does not mean his/her speech is phonetically closer to General American English.

Lastly, Figure 3.10 also negates the original hypothesis by showing that there is little relationship between dialect density and social interaction. Some of the students with high social interaction scores had low dialect density scores, meaning their dialects sounded very similar to the GAE dialect, and others had high dialect density scores, meaning their dialects were very distinct from GAE. Those with low dialect density scores do not appear to interact with American English speakers any more than those with high dialect density scores. Although results did indicate that international students interact disproportionately with other international students over English-speaking American students, dialect density does not appear to be a major cause of this disproportional social interaction.
The only variables in this study that showed significant relationships with self-perceived social interaction were level of comfort and self-perceived dialect density. The international students who had the lowest levels of comfort interacting with American English speakers also had lower self-perceived social interaction scores. The international students who felt most comfortable interacting with American English speakers were also the students who indicated the most social interaction with them. Additionally, the students who ranked their own dialect density the weakest (1-Mild) also had higher self-perceived social interaction scores. These results suggest that social interaction with native speakers is primarily dependent on personal confidence, comfortability, and perceptions of one’s own dialect, rather than on objective features of speech such as rate and mean length utterance.

However, some nonnative speakers may believe that their dialect is the exclusive cause of their communication problems (Derwing & Rossiter, 2002). This belief, in turn, may influence how comfortable they feel interacting with native speakers and thus, decrease their social interaction with them. Further research is needed to determine what causes nonnative speakers to feel uncomfortable interacting with native speakers and just how directly or indirectly dialect density influences social interaction.

In order to completely measure how dialect density affects social interaction, further studies should be conducted on a broader level. The results of this study were
directly influenced by its participants. For example, the sample size of this study was rather small with only 16 international students participating. Additionally, the international students interviewed only represented 10 countries. Future research may involve a larger sample with students from a wider range of countries. Research on dialects in other countries suggests that the effects of speaking with a nonnative dialect may be generalizable across countries and languages. (Gluszek, Newheiser, & Dovidio, 2011). However, further research may explore how social interaction with native speakers varies from host country to host country. Future research may even go beyond international students to study how the impact of dialect density on social interaction with native speakers changes based on age group or years spent in the nonnative country.

Increased globalization and contact between speakers of different languages, with different accents, will only exacerbate the issues that nonnative speakers currently face (Gluszek, Newheiser, & Dovidio, 2011). More in-depth research is needed to determine precisely what is causing communication barriers between native and nonnative speakers. If level of comfort and self-perceived dialect density are the biggest factors determining level of social interaction with native speakers, we must discover what is making some nonnative speakers uncomfortable and self-critical and what can be done to improve the situation. Some researchers have already argued that instead of attempting to reduce dialects or force social interaction, efforts should be directed at modifying native
speakers’ perspectives on dialects and nonnative speakers in general (Weyant, 2007).

Until a root cause of the interaction barrier between native and nonnative speakers is determined, a successful course for improvement cannot be created. Research must continue until both root causes and solutions are found to make our world a more welcoming place, where all can interact equally regardless of their native countries.
REFERENCES


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Appendix A
Project Informed Consent Document

INFORMED CONSENT DOCUMENT

Project Title: Testing the Correlation of Dialect Density and Social Interaction

Supervisor: Janice Smith, SLP-CCC, Ph.D, Communication Sciences & Disorders Department (CSD) at Western Kentucky University (WKU) Email: janice.smith@wku.edu Phone: 270-991-4973 Office: 270-745-5875

Investigator: Madeline Martia, undergraduate student in Communication Disorders at WKU Phone: (855) 445-7939 Email: madeline.martia244@topper.wku.edu

You are being asked to participate in a project conducted through Western Kentucky University. The University requires that you give your signed agreement to participate in this project. You must be 18 years old or older to participate in this research study.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1. Nature and Purpose of the Project:
The purpose of this project is to explore the correlation between dialect density and social interaction, particularly of individuals from the international student population on WKU’s campus. Approximately 20 students between the ages of 18 and 30 years from many different countries will be recruited.

2. Explanation of Procedures:
If you agree, a brief survey will be sent to you via email asking about cultural norms of communication where you are from and how you feel your dialect may influence others’ opinions of you. We will schedule one meeting time, during which, you will read a short story and answer some questions. All meetings will be videotaped and recordings will be kept on a private hard drive. All meetings will take place on campus and should not last more than an hour.

3. Discomfort and Risks:
This project is safe. There are no anticipated risks associated with the project. You may opt-out of the study at any point. All recorded sessions will be stored on a hard drive that only the researchers can access. Your name or other identifying information will not be used to describe/label video files or any data collection documents.
4. **Benefits:**
Results of this research will be used to collect evidence to investigate the need for new ways to expand interaction with the international student population and build a more welcoming community at Western Kentucky University.

5. **Confidentiality:**
Results of this study will be submitted for publication but will not include any information that will identify you. All recorded sessions will be stored on a secure hard drive. Participants names or other identifying information will not be used to describe/label video files or any data collection documents.

6. **Refusal/Withdrawal:**
Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

__________________________________________
Signature of Participant

__________________________________________
Date

__________________________________________
Witness

__________________________________________
Date

- I agree to the audio/video recording of the research. *(Initial here)*

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD
Paul Mooney, Human Protections Administrator
TELEPHONE: (270) 745-2129

WKU IRB# 18-071
Approval - 10/3/2017
End Date - 6/1/2018
Expedited
Original - 10/3/2017
Appendix B
Interview Question Outline

1. Tell me about yourself.

2. Where are you from? What is it like there?

3. Tell me about customs from home that you do not see or experience here in the US?

4. What are you studying?

5. Do you have friends in your classes? Tell me about one of your friends.

6. When you are in your dorm/apartment do you hang with your friends? If so, what do you usually do with your friends?

7. Do you have a group of people you study with? Describe what that usually looks like.

8. Do you have a job in addition to your studies? If so, what does a typical co-worker interaction look like?

9. When you text or call, do you contact mostly people back home, other international students, or English speakers from the US?

10. On a scale of 1-100, with 1 being not comfortable at all and 100 being completely comfortable, how comfortable do you feel interacting with English speakers from the US?

11. Do you feel your accent limit your interactions with English speaking students from the US?

12. On a scale of 1-100, with 1 being never and 100 always, how often would you say English speakers from the US understand what you say?
13. Would you consider your accent to be:

1- mild
2- moderate
3- strong
X- I do not have an accent
Appendix C
“The Caterpillar” Passage

“Do you like amusement parks? Well, I sure do. To amuse myself, I went twice last spring. My most MEMORABLE moment was riding on the Caterpillar, which is a gigantic roller coaster high above the ground. When I saw how high the Caterpillar rose into the bright blue sky I knew it was for me. After waiting in line for thirty minutes, I made it to the front where the man measured my height to see if I was tall enough. I gave the man my coins, asked for change, and jumped on the cart. Tick, tick, tick, the Caterpillar climbed slowly up the tracks. It went SO high I could see the parking lot. Boy was I SCARED! I thought to myself, “There’s no turning back now.” People were so scared they screamed as we swiftly zoomed fast, fast, and faster along the tracks. As quickly as it started, the Caterpillar came to a stop. Unfortunately, it was time to pack the car and drive home. That night I dreamt of the wild ride on the Caterpillar. Taking a trip to the amusement park and riding on the Caterpillar was my MOST memorable moment ever!” (Patel, Connaghan, Franco, Edsall, Forgit, Olsen, & Russell, 2013, p. 2).
Appendix D  
Self-Perceived Social Interaction Survey

Please answer all questions on a 1-10 scale, with 1 being only international students and 10 being only English speakers from the US.

1. In your residence (apartment complex, residence hall, etc.), how often do you talk with English speakers from the US?
   - 1- I only talk to other international students in my residence
   - 2
   - 3
   - 4
   - 5- I talk to about half English speakers from the US and half international students in my residence
   - 6
   - 7
   - 8
   - 9
   - 10- I only talk to English speakers from the US in my residence

2. In class, how often do you talk with English speaking students from the US?
   - 1- I only talk to other international students in my classes
   - 2
   - 3
   - 4
   - 5- I talk to about half English speaking students from the US and half international students in my classes
   - 6
   - 7
   - 8
   - 9
   - 10- I only talk to English speaking students from the US in my classes
3. Of the people you study with, how many are English speaking students from the US?
   • 1- I only study with other international students
   • 2
   • 3
   • 4
   • 5- About half of the time I study with international students and half with English speaking students from the US
   • 6
   • 7
   • 8
   • 9
   • 10- I only study with English speaking students from the US

4. Of the clubs and organizations you are in, how many members are English speaking students from the US?
   • 1- All members are international students
   • 2
   • 3
   • 4
   • 5- About half of the members are international students and half are English speaking students from the US
   • 6
   • 7
   • 8
   • 9
   • 10- All other members are English speaking students from the US

X- I am not in any clubs or organizations
5. When you go off campus, how often do you go with English speakers from the US?
   • 1- I only go off campus with other international students
   • 2
   • 3
   • 4
   • 5- About half the time I go off campus I go with other international students and half with English speakers from the US
   • 6
   • 7
   • 8
   • 9
   • 10- I only go off campus with English speakers from the US

   X- I have never been off campus

6. At WKU events (football games, concerts, festivals, etc.), how often do you interact with English speakers from the US?
   • 1- I only talk to other international students at WKU events
   • 2
   • 3
   • 4
   • 5- I talk to about half English speakers from the US and half international students at WKU events
   • 6
   • 7
   • 8
   • 9
   • 10- I only talk to English speakers from the US at WKU events

   X- I have never been to a WKU event
7. At work, how often do you interact with English speakers from the US?
   • 1- I never interact with English speakers from the US at work
   • 2
   • 3
   • 4
   • 5- About half of the people I interact with at work are English speakers from the US
   • 6
   • 7
   • 8
   • 9
   • 10- I only interact with English speakers from the US at work
   X- I do not have other employment in addition to my studies.

8. Of the meals you eat with other people, how often do you eat with English speakers from the US?
   • 1- I only eat with other international students
   • 2
   • 3
   • 4
   • 5- I eat half of my meals with international students and half with English speakers from the US
   • 6
   • 7
   • 8
   • 9
   • 10- I only eat with English speakers from the US
9. Of the people you typically text throughout the day, how many are English speakers from the US?

- 1- No one I text is from the United States
- 2
- 3
- 4
- 5- About half the people I text are English speakers from the US and half are not
- 6
- 7
- 8
- 9
- 10- I only text English speakers from the US

X- I do not text

10. Of the people you typically call on the phone, how many are English speakers from the US?

- 1- No one I call is from the United States
- 2
- 3
- 4
- 5- About half the people I call are English speakers from the US and half are not
- 6
- 7
- 8
- 9
- 10- I only call English speakers from the US

X- I do not make telephone calls