INTERLANGUAGE VARIATION: THE INFLUENCE OF CONTEXTUALIZED LANGUAGE ON L2 PHONOLOGICAL PRODUCTION

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This study analyzes the production of the English /I/ in obligatory contexts by a Spanish-speaking L2 learner of English, whose phonological system does not include /I/. This study investigates how context—defined by Duranti and Goodwin (1992) as "a frame that surrounds the event being examined and provides resources for its appropriate interpretation" (p. 3)—affects a speaker's ability to accurately produce native-like phonemes in their L2. The main research question that focuses this study is the following: How do differing levels of textual formality and degrees of contextualization affect the phonological production of the English high/front, lax vowel /I/ by a Spanish-speaking learner of English?

Contrary to Labov's hypotheses (1966) for L1 speech, the results of the study showed that the participant was most accurate in her production of /I/ in the more vernacular register, i.e. narration, than in the more formal register, i.e. minimal pair naming. Apparently, contextual clues influenced the speakers' pronunciation of semantically-familiar words. Future studies need to consider what psycholinguistic and reading processes are occurring that cause familiar words, out of context, to be pronounced differently than those embedded in contextualized language. The presence of contextualized language appears to prime the speaker and activate not just lexical features but also phonological components. In spite of being familiar with the semantics of the target words, the subject of the current study achieved greater phonological success when the words were contextualized.

INTRODUCTION

Language variation theory has investigated and attempted to explain why speakers choose, consciously or subconsciously, their forms of speech. William Labov (1966) was one of the first who studied the concept of language variation in his investigation of speech monitoring. Since then, an abundance of research has investigated the speech of native and nonnative

speakers alike. Besides the myriad studies addressing L2 learners' perception of L2 phonological features, another area that has received substantial attention is how L2 production changes according to the context of oral production, i.e., narrative, conversation, reading, etc.

Psycholinguistic research has also shown that many lexical factors influence word recognition, such as text frequency, subject familiarity, age of acquisition and imageability (concreteness). This raises the question as to whether or not these factors not only influence recognition but also accurate production of phonemes. Wade-Woolley (1999) claims that "The phonological system of the native language constrains the L2 learner's ability to perceive and produce the sounds of the target language" (p. 451). She also states that perception of speech is to some extent a "language-specific" process. This was also found by Flege, Bohn and Jang (1997), who obtained results that differed from those of previous studies, which varied according to the speaker's L1 and other minor factors. They found that the relation between the production and perception of the sound being studied and the participant's L1 were significant. Not only is the language a factor in perception but also the different experiences that a learner has with the language. Best and Strange (1992) state that "Language-specific experience influences the perception of phoneme contrasts" (p. 305). The different experiences that people have with the language influence how they are able to process and produce phonological differences.

This study investigates how context—defined by Duranti and Goodwin (1992) as "a frame that surrounds the event being examined and provides resources for its appropriate interpretation"—affects a speaker's ability to accurately produce native-like phonemes in their L2. This study focused on the production of the English /I/ in obligatory contexts by a Spanish-speaking L2 learner of English. The research questions that focus this study are the following: How do differing levels of textual formality affect the phonological production of the English high/front, lax vowel /I/ by a second language learner?; What effect does the degree of contextualization have specifically on the participant's production of /I/ in obligatory contexts?

LITERATURE REVIEW

A formant analysis of the Spanish vowel system by Stockwell and Bowen (1965) reveals that the Spanish vowel /i/ approximates most directly the English /i/, but may also share features with the English vowel /I/. They found the same for the Spanish vowel /e/, which overlaps with the English vowel /I/. Both the English /i/ and the /I/ are front/high vowels with the major difference being that /i/ is tense and /I/ is lax (Whitley, 1986). The Spanish vowels /i/ and /e/ are also front vowels. This overlapping of the sounds can make the distinction between the English /i/ and /I/ difficult for L2 speakers of English to produce and, in turn, difficult for L1 interlocutors to differentiate in the speech stream. Some authors have used formants—the reinforced harmonics of a vowel sound detectable through a spectrogram analysis—and

voice onset time (VOT) to determine which language's linguistic system was being employed (Flege et al., 1997; Mendez, 1982). Through formant analysis, Mendez found that no significant difference existed at the acoustic level between the /i/ of English and Spanish and the /a/ of English and Spanish.

Many learners struggle to produce the new sounds in the L2 and tend to approximate them to the nearest sound in the L1. Flege (1991) declares, "Adult beginners typically interpret L2 vowels as instances of the closest L1 vowel, and produce them accordingly" (p. 440). With this in mind, changes in the adult L2 learners' production and perception will continue as they progress along the interlanguage continuum and approximate the L2 phonemes of native speakers. The most problematic sounds to produce and recognize are those that have the same graphemic representation in the L1 and the L2 but have a different allophonic or phonemic value in the L2. For example, the grapheme {a} in Spanish as in *gato* corresponds to the phoneme /a/ where as in English this same grapheme has several phonemic and allophonic manifestations (as in *pat*, *father, fate,* etc.).

In a study that measured the degree to which L2 speakers could produce and perceive the English vowels as they were intended, Flege et al. (1997) found that experience producing and perceiving the distinction between /i/ and /I/ in Spanish-speaking learners of English did not play a significant role but was a factor with other vowels. This means that causes other than experience must have played a part in the speaker's accurate production and recognition of these minimal pairs. Regarding L2 learners' production of the Spanish /i/ and /I/, Flege et al. comments that "their perception may be somewhat more native-like than is their production" (p. 465). This may likely be the result of different cognitive processes that function when speakers are forced to produce versus mere perception. Though different factors affect these two skills, they are related. In this same study, it was found that the Spanish speakers had several cases of reversals, i.e., pronouncing *bit* for *beat* and vice versa. Orthography is assumed to play a key role in these reversals because words such as *bit* are not pronounced as written with the Spanish vowel /i/ but rather the English /I/.

Wade-Woolley (1999) researched the effects of first language on second language word reading. She studied how speakers transfer the orthography and phonology from the L1 to the L2. She claims:

> Language-specific processing parameters may be set in the process of L1 literacy acquisition, and that, depending on the degree of similarity between L1 and L2 orthographies, even highly fluent L2 speakers may continue to employ less-than-optimal underlying strategies in the process of L2 word recognition (p. 450).

Wade-Woolley (1999) also states that first language effects on phonological production in L2 reading have received little attention. She continues by saying that phonological processing in readers depends on when

literacy is achieved and that more fluent readers use phonology to support visual and semantic processing of unfamiliar words. Additionally, phonological processing facilitates the storage of information in the working memory. Wade-Woolley proposes the hypothesis that poor phonological representations may underlie reading difficulties. These phonological variations may be sounds that are not present in the L2 speakers' L1. This would be particularly problematic for beginning learners of the language who have limited practice using the language and recognizing the differences. However, it is important to mention that the L2 learner may need some other clues that help to decipher the complex phonology of a language like English, especially since there is not a one-to-one sound-symbol relationship. The activation of both the phonological and orthographic processes is key to comprehensible and fluent reading.

Nagy, McClure and Mir (1997) studied how Spanish-English bilinguals used contextualized language and the result of this on linguistic transfer. They investigated how these bilinguals' L1 syntactic knowledge affected the decisions and inferences that they made from context on new words encountered in English. According to their study, some research has shown that learners benefit most from local context, i.e., surrounding lexical items, and that the global or discourse context has minimal influence on the ability to infer meanings. This study found that highly fluent bilingual graduate students had the highest rate of semantic transfer errors. The authors attempt to explain this in several ways, hypothesizing, for instance, that learners need a certain level of proficiency in order to be able to be deceived by the syntactic contexts. They also state that the multiple-choice format may have caused more problems for the advanced speakers and thus caused a negative correlation in English reading proficiency and transfer errors. The advanced speakers may have thought themselves out of correct answers. As with previous studies mentioned here, the focus was on the understanding of new words in context. The authors did not attempt to check the bilinguals' accurate production of the new lexical items. This would have helped them to see if the syntactic information in the sentences helped the bilinguals not only in regards to semantic transfer but also the possible influence that contextualized language plays on production.

Other researchers have found that not only is the L2 phonology affected by the L1 but that L2 learners' production of their L1 was also affected, i.e., bi-directional transfer. Flege et al. (1997) found in a study of French and English bilinguals that their speech production differed significantly from their monolingual peers. They state,

> This finding undermines the view that interference and "universal" effects on production deriving from the nature of the speech production mechanism are the only factors which directly influence how authentically L2 phones are produced (p. 61).

He continues by stating that interference implies a unidirectional effect from the L1 to the L2. This was not reflected in his data, where he found that in the highly proficient bilinguals, there was a bi-directional effect. Due to this bi-directional transfer of phonology, he hypothesizes that there is a phonological merging that takes place. "The 'merging' of the phonetic properties of similar L1 and L2 phones might account for what appears to be an upper limit on phonetic properties of similar L2 phones" (Flege, 1997, p. 62). He asserts that this might prevent L2 learners from developing separate phonetic categories for similar L2 phones and that this would impede them from being able to produce similar phones in the L1 and L2 authentically. This could also lead one to investigate whether or not L2 learners have established a new phonetic category where certain similar sounds in the L1 and L2 have been reclassified using phonological features from both languages to form a sound that is not completely native in either language. Again, many of these differences would not be detectable to the native speaker but rather could be measured through formant analysis. This analysis would be counter to psycholinguistic research that states that bilinguals have access to two different lexical systems as suggested by Kroll and Stewart (1994) and MacNamara and Kushnir (1971).

In the study of vowel identification by Spanish/English bilinguals, Flege (1991) found that many production errors arise from the inaccurate perception of L2 sounds. He also states that speech perception is an "obligatory process" and that L2 learners try to make "perceptual sense of sounds making up L2 words" (p. 702). He goes on to say, "Adult learners' perceptual 'errors' may not be evident, however, because they often comprehend the L2 in absence of accurate phonetic perception by exploiting semantic context and their knowledge of the world" (p. 702).

One method that Flege used to look at bilinguals' perceptual errors was through the way that they pronounce the L2. As previously mentioned, when an unfamiliar L2 sound is identified, the L2 learner will often employ the L1 sound in its place. He had some difficulty in his analysis of data regarding the classification of the different vowels. "It is unclear in many instances whether the 'substitutes' reported were English vowels, Spanish vowels, or a phonetic approximation of the intended English target vowel" (p. 703). Flege states that L2 learners have problems with sounds that approximate their L1 sounds is that the proximity of sounds "blocks their phonetic category formation needed for authentic production" (p. 707). Flege found that L2 speakers produced sounds that did not exist in their L1 more authentically than L2 vowels that merely differed acoustically from a vowel in the L1. The results from this study showed that only a few of the Spanish participants were able to show a clear distinction between /i/ and /I/, while those who did not divided the continuum between the sounds on the basis of duration differences. Those speakers who were successful appear to have formed an /I/ category in their L2 phonological system.

One of the problems that some researchers have found when looking at speech samples where the speaker is allowed to talk freely is avoidance of certain sounds. This avoidance can cause difficulties in the analysis of

production in naturally occurring speech and in interviews. Piske, McKay and Flege (2001) found that speakers would avoid not only difficult L2 sounds but also sound sequences and even words that were phonologically taxing for them. This is one of the motivations for having L2 learners produce speech at different levels of formality. This allows the researcher to compare the speech at these levels and determine whether differences do exist between when speakers freely talk compared to when they read or produce single lexical or syllabic utterances. In the following study, type of speech style, i.e., conversation, narration, reading and accurate L2 phonological production were compared to see how these factors interacted in the L2 learner.

Although Labov's ground-breaking sociolinguistic work in New York with attention to speech was conducted with native speakers of English, others have applied this paradigm to non-native speakers (Adamson, 1988; Preston, 1989). Similar to native speakers, L2 learners' speech becomes more standard as they pay closer attention to their speech. Non-native speakers must deal with the issue of proficiency on the one hand and degree of formality on the other. Adamson (personal communication, October, 2002) has distinguished between two continua—vertical and horizontal—in L2 interlanguage. According to this theory, learners of a second language must progress along the vertical continuum, or axis, before being able to progress along the horizontal continuum or axis. The vertical continuum represents the degree of overall proficiency or mastery of the second language, while the horizontal continuum represents sensitivity to issues of style, register and pragmatics. The rationale behind such a theory is clear: an L2 learner who struggles to master basic language skills, i.e., grammar, aural comprehension, oral expression, will be less likely to demonstrate a sensitivity to more subtle aspects of language, i.e., phonological differences of formality.

Another issue relative to this research pertains to degree of formality and the amount of influence from the speaker's L1 phonology in producing L2. This question takes the reader back to the original research questions posed in the introduction and reproduced below: (1) How do differing levels of textual formality affect the phonological production of the English high/front, lax vowel /I/ by a second language learner (Spanish L1)? (2) What effect does the degree of contextualization have specifically on a learner's production of /I/ in obligatory contexts?

STUDY

Although the aforementioned research has looked at both the production of speech by L2 learners and the recognition of new words and sounds by these same learners, there is a lack of research to measure the effect style and contextualized language have on speakers' L2 pronunciation. Though some of the studies have shown that learners used contextualized language to derive the meaning of new words, they fail to clarify how using language with contextual clues helps the phonological production of a speaker (Nagy et al., 1997). Most researchers generally accept the notion that as the

monitoring of speech increases, so will the proximity of the speaker's utterances to that of the native population, but the following research demonstrates how this might not always be accurate. This research hopes to provide new insights in explaining language variation in the production of speakers by considering the effect of contextualized language on L2 learners' pronunciation.

METHODS

Participant

The following study consisted of one participant. She was a native-speaker of Spanish from Spain. She was twenty-three years old at the time of the interview. She moved to the United States when she was 19. Her prior experience before coming to the United States was limited to public-school classes at both the primary and secondary level. In spite of this instruction, she arrived in the United States with no functional ability in any of the four language modalities. The participant had studied at the university level in Spain and upon arrival in the United States attended an English academy. After a year in the United States, she was able to score high enough on the TOEFL test to gain admission to a private university. This participant would be considered an advanced speaker of English but with a notable foreign accent. She was chosen due to her relatively high level of proficiency and willingness to participate in the study. She was asked to speak in different contexts representing varying degrees of formality or style in order to observe if that affected her pronunciation of the English /i/ and /I/. Both of the researchers in this study knew the participant before conducting this research.

Procedures

Speech was elicited from the participant at several different degrees of formality starting with the most informal or vernacular (i.e., narration) to the most monitored speech (i.e., minimal pairs). All of the meetings with the Spanish-English bilingual were recorded so as to be later coded and analyzed using the VARBRUL software. First, the participant's narration was elicited. She was asked to recount several emotionally charged experiences reflective of the classic Labovian interviewing style. This was done in order to hear the least monitored or vernacular style of speech. This part consisted of roughly 45 minutes of narration. The second part of the study consisted of an audiotaped 45-minute conversation between the participant and her husband. Third, the participant was asked to read a passage that contained tokens with the English vowels /i/ and /I/. The researchers initially gave the participant a different passage than the one found in the appendices to this paper (see Appendix A). Upon questioning the speaker regarding the passage, it was decided that many of the words from the original list were unfamiliar to her and thus not a valid measure of her ability to distinguish between the vowels in English. Due to the lack of sound-symbol correspondence in English, both native and nonnative speakers often struggle to correctly pronounce new

words. A second passage was created by the researchers with words that the participant knew (see Appendix A). This passage also contained the minimal pairs from the minimal pair list that was used in the study.

The fourth level of formality was that of a reading list wherein words were used that contained both the target vowels and other distractors (see Appendix B). The participant was again asked after reading the list if there were any words that she did not know and only one token was discarded. The researchers determined the participant's knowledge of a word by asking her to define it and use it in a sentence. They allowed definitions and explanations in both English and Spanish. If both researchers agreed upon the definition given, the token remained, but if the definition was ambiguous or incorrect, the token was thrown out. The final elicitation of speech was done through the use of minimal pairs, where the speaker was asked to pronounce 24 different minimal pairs (see Appendix C). These included tokens such as *sleep* vs. *slip*, *bit* vs. *beat*, etc. The participant was familiar with all of the tokens in the minimal pair list. Again, the researchers initially used a different list of minimal pairs but it was again found that the participant was unfamiliar with many of the words and so a new list was created using more common words (see Appendix C). Because of the fact that the production of minimal pairs is the most monitored form of speech, the administration of two lists would not be problematic and at most, it should raise the speaker's awareness of the distinction even more. When asked by the researcher regarding the features being studied in the lists, the participant stated that she was not aware of their specific purpose but did understand that her speech was being studied in some way.

After recording the different speech samples, both of the researchers coded over two hundred tokens together to establish reliability between them. The remaining tokens were coded separately but with agreement checks periodically to ensure accurate coding. All of the tokens in the reading passage, list and minimal pairs were coded by both researchers together to ensure accuracy. Agreement was reached on all tokens. Both of the researchers are native speakers of English, so they would listen to the tokens the necessary number of times to define it as native-like or not. If a token consisted of phonology from both Spanish and English, then a decision was made by the researchers as to which phonological system it represented best.

Not all of the data were transcribed but rather just the tokens that contained or should have contained the English vowel /I/ in an obligatory context. Other words or parts of words were excluded due to the different regional variation that could exist and thus not make /I/ an obligatory sound i.e., ability, artificial, etc. Also, words containing the string of sounds represented by "ing" or "ink" were discarded due to variation in American English that does not always require /I/, i.e., /i?g/ or /I?g/; /i?k/ or /I?k/; /in/ or /ik/. Each token was coded according to 11 characteristics that are listed on the coding sheet (Appendix D). Some of these include the following: part of speech of the token, the sound immediately following and preceding the target vowel, style of speech, etc. The lexical item *it* was initially coded, but after

more than forty correct pronunciations, the researchers determined that the speaker would categorically produce *it* correctly. Upon coding the remaining tokens, no case of incorrect pronunciation of *it* was encountered. Other very common words such as *in*, *this*, *with*, *is*, etc. were classified separately under the category of lexical item on the coding sheet. The researchers thought these high-frequency words might be produced differently because of their frequency in the language. Finally, after all of the tokens were recorded and coded, VARBRUL was used to determine how the different elements of speech were or were not related as well as the percentages of tokens in each of the different categories. VARBRUL also provided a Chi-square value on the cross-tabulation of the factor groups on the coding sheet.

RESULTS

The results of the study showed that the participant was most accurate in her production of native-like /I/ in obligatory contexts in the conversation and narration portions of the interview. Her accuracy was in the opposite direction of the traditional Labovian hypothesis for native speakers which argues that the more monitored styles - minimal pairs, word lists -, lead to more accurate, standard phonological production while the more vernacular style, i.e., conversation, narration, leads to less monitored speech. Although the Labovian hypothesis pertains to native-speaker speech, others have applied this paradigm to non-native speakers (Adamson, 1988; Preston, 1989). The participant produced /I/ correctly in obligatory contexts over 88% of the time. Of all of the factor groups coded (see Appendix D), only style and minimal pair availability affected the participant's accuracy.

Table 1: Totals of Correct and Incorrect Uses of /I/ Based on Style of Speech

Style	Number of Correct Uses and (%)	Number of Incorrect Uses and (%)	Total Number of Tokens and % of Overall Total
Narrative	228 (96%)	10 (4%)	238 (36%)
Conversation	291 (97%)	9 (3%)	300 (45%)
Reading Passage	61 (87%)	9 (13%)	70 (11%)
Word List	25 (76%)	8 (24%)	33 (5%)
Minimal Pairs	10 (42%)	14 (58%)	24 (4%)

Table 1 shows the division of the participant's speech according to style. It can be seen that the number of non-applications or incorrect instantiations of /I/ increased as her speech became more and more monitored. With minimal pairs, she actually produced more non-applications (14) than correct applications (10). Correct application refers to the accurate production of /I/ only in obligatory contexts, i.e., situations where all dialects of American

English would use /I/ and a non-application means the use of any other vowel besides /I/ in obligatory contexts.

Using IVARB, it was determined that the only significant influencing factors in the study were that of speech style and whether a token had a minimal pair. Upon running cross-tabulation analysis of these two factors, a Chi-square value of 100.98 resulted with a significance of > .001.

DISCUSSION

The results from this study offer a new perspective on the notion of phonological production. Contextualized language has traditionally been used in regards to comprehension but not in terms of phonological accuracy. The participant in this study used language context not only to derive meaning from the words but also as a guide to correct pronunciation. The sound /I/ does not exist in the Spanish vowel system, so learners have to figure out how they are going to incorporate this sound into their newly acquired L2 phonological system. This speaker appeared to rely on the degree of contextualization accompanying her speech production to give her a phonological clue to produce this foreign phoneme.

The complex sound-symbol relationship in English was compounded by the presentation of isolated, decontextualized words. As already mentioned, L2 learners of English as well as native English speakers struggle when the pronunciation of new words is not known. Often, speakers know the meaning of the words when presented visually but have never heard them articulated with enough frequency to correctly recall the phonology at the moment of production (Kolers, 1966). The effect of this complex sound-symbol relationship was apparent when the participant was presented visually with minimal pairs bereft of surrounding context. The participant was not able to determine the proper pronunciation of almost 60% of the minimal-pair tokens when presented on paper in isolation in spite of the fact that she had produced many of the tokens correctly in a reading passage which contained all of the same minimal pairs. Furthermore, her production of some of these minimal pairs was accurate in narration and conversation as well. Evidently, the participant's difficulty in accurately pronouncing English words resides not only in the ability to decipher the deep orthography of English and its semantics, but also in the level of contextualization.

The authors also found that the participant did not always produce a sound clearly attributable to Spanish or English phonology. Many times the sound would start as one vowel, /I/, and finish as another, /i/, or vice versa, reflecting a possible attempt to try to approximate the native-speaking norm. This could also be explained by the research of Stockwell and Bowen (1965), which states that these two sounds share certain features. Additionally, when our participant attempted to produce the minimal pairs, she produced the same vowel but varied the vowel length or pitch attempting to differentiate the two sounds. This lengthening of vowels and change of pitch did not change the vowel quality but reflected the monitoring that was occurring as she tried to

distinguish between the two words. She was aware of the difference because of the distinct orthography that was present but she was unable to determine the correct vowel distinction. This research also offered similar results as those of Flege (1991), where it was found that there were reversals in the production. It is assumed that the sound /i/, which exists in Spanish phonology, would be the likely substitute but in fact the speaker would at times chose /I/ for both words (i.e., *still* and *steal* both pronounced as *still*.)

CONCLUSION

This study shows how contextual clues influence speakers' pronunciation of semantically-familiar words. Future studies need to consider what psycholinguistic processes are occurring that cause familiar language, out of context, to be pronounced differently than contextualized language, i.e., reading passage, conversation, narration. Kroll and Stewart's (1993) revised hierarchical model of lexical and conceptual representation in bilinguals does much in shedding light on bilingual speakers' access to two different lexicons. However, this model does not provide much insight into how the degree of contextualization influences the accurate production of L2 phonology with lexical items from L2. The presence of contextualized language appears to prime the speaker and activate not just lexical features but also phonological components. In spite of being familiar with the semantics of the target words, the participant of the current study achieved greater success when the words were contextualized.

Some authors have attributed L2 phonological variation to cross-linguistic transfer and interference implying that future research should look at other languages besides Spanish and English. Additionally, this study looked at only one participant and individual variation may have played a role in her production. Future research should include a variety of speakers and a cross-linguistic comparison of their native languages in order to see if L1 transfer plays a significant role in L2 production.

No attempt was made here to propose a definitive model for phonological variation in L2 speech for the results obtained. However, both the field of Second Language Acquisition and psycholinguistics might benefit from reconsidering the interaction between L2 lexical familiarity, meaningful L2 contextualization and L2 production.

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APPENDIX A

The Potato Farmer

Being married is a tough job. There are many differences between my husband and me. I will tell you about some of them. My husband, Tim, grew up on a farm with goats, sheep, cows and other animals. He lived in Idaho for many years and he hated to leave to go to school. His house was on a hill so they could be seen for miles around. From his home, you could see a green mountain peak nearby and there were many fruit trees such as apple trees, peach trees and apricot trees. He says that the apricot trees are beautiful all leafed out with their white blossoms. His family had to pick potatoes in order to try to make money but they never got rich. The problem was that after a day of picking potatoes his feet would feel really sore from walking and so would his back because he had to lift the potatoes into a tractor and fill it up. After picking the potatoes, he would have to go to his home and peel them. No one lives close so at night it is so still and quiet that it is hard to sleep but at least you do not have to worry whether anyone will steal your car or not like in a big city. It is too quiet for me and sometimes I have to take a pill just to sleep.

When I would visit him, we would sit on his porch and read together. I first thought that he was just cheap and didn't want to spend money but I realized that he was sore from so much work and was trying to heal his sore back. He had a big grin on his face when he explained that picking potatoes was not as easy as it might seem. It requires several people who work together as a team. He explained that each person had a list of tasks to perform and that he would lead them all out to the field to begin the labor. You have to set the potatoes in the tractor and you can't pitch them in. Each potato has to fit in a particular spot and sometimes they slip into the wrong spot and you move them. This is hard because the back of the tractor is very deep and they can be hard to reach.

He said that you have to be careful about the potatoes that you harvest because it is a sin to sell bad potatoes. If you have bad potatoes, you get rid of them by feeding them to the pigs. He bit into one to show me what a bad potato looked like on the inside. I thought it was disgusting. The tractor that they used was very old. It had only one wheel on the front and two on the back. The window had a chip in it and it was hard to see. In addition, the driver's seat was cracked and had a big dip in the middle that made it really uncomfortable. The roof had many dents in it and looked as if someone beat it with a baseball bat. After all the potatoes were picked, he would put them in a big container with a lid to keep them from falling out. They were then transported to a port and went by ship to different countries across the world. I have decided that I do not want to be a potato farmer. I prefer to live in the city.

APPENDIX B

List (33 tokens)

Activity	give
telephone	extreme
improvement	funds
school	it
artificial	which
computer	will
his	local
academic	scientific
teach	and
video	population
important	mother
some	picture
different	because
during	digitized
ill	clip
technology	knowledge
principle	project
if	inch
difficult	is
book	still
politics	simulation
win	help
within	continue
money	refrigerator
trick	paper
authenticity	particular
poverty	college

APPENDIX C

Minimal Pairs

peak – pick
grin – green
sleep-slip
seen-sin
deep-dip
least – list
steal-still
feel-fill
pill-peel
team-Tim
leave – live
sit – seat
sheep-ship
chip-cheap
heal-hill

slip – sleep
will-wheel
lead – lid bit –
beat
rich – reach
read – rid
feet – fit
pitch – peach
leafed – lift

APPENDIX D

Coding Sheet for /I/

Column 1: Dependent Variable
        0: No use of /I/ in obligatory contexts
        1: Use of /I/ in obligatory contexts

Column 2: Style
        N: narrative
        C: conversation
        R: reading
        L: lists
        M: minimal pairs

Column 3: Stress
        P: primary
        S: secondary

Column 4: Minimal Pair
        0: no minimal pair available
        1: minimal pair available

Column 5: Preceding Sound
        C: consonant
        V: vowel
        N: none (pauses, start of sentence)

Column 6: Following Sound
        C: consonant
        V: vowel
        N: none (pauses, start of sentence)

Column 7: Part of Speech
        V: verb

N: noun
A: adverb
P: preposition
J: adjective
R: pronoun
O: other
C: conjunction

Column 8: Lexical Item
T: this
I: it
N: in
S: is
H: his/him
D: did/didn't
W: with
 /: other words

Column 9: Number of syllables
1:1
2:2
3:3
4:4
5:5+

Column10: Background/Foreground
B: background
F: foreground
O: other

Column 11: Speaker knows/does not know the word
K: Knows the word
D: Does not know the word