Tyler Perrachione
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Prof. A. Bradlow
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Intra-talker Variation: Audience Design Factors Affecting Lexical Selections

Abstract

Although the acoustic and articulatory correlates of clear speech have been extensively studied, the syntactic, pragmatic, and lexical factors underlying native speaker to non-native speaker communication are less well understood. A case study is described where one individual performed the same communicative task with either a native or non-native listener. Lexicon size and distribution, as well as extent of adjectival modification are examined between the two conditions to determine the degree of audience design at these levels of speech production.

Introduction

The study of clear speech examines the sort of acoustic and articulatory changes that speakers make when they are in a situation where they believe they may be poorly understood. These sorts of changes are compared against how speakers behave normally, when comprehension can be taken for granted (see Uchanski 2005 for a review). The phenomenon of clear speech can be framed within the domain of "audience design." Audience design is the notion that individuals adjust the ways they speak in order to target a particular listener or group of listeners. The study of audience design generally contrasts such situations as intimate versus formal conversation, jargon versus simplicity, lecture versus conversation, etc. The relationship between clear speech and audience design is straightforward enough to assume they are part of the same, larger, communicative phenomenon. Both clear speech and audience design can be viewed within the framework set forth by Grice (1975) for analyzing discourse. When speakers make their contributions as meaningful and relevant as possible, communication is most facilitated.

Although the domain of clear speech tends to encompass interactions between speakers of high and low proficiency, especially between native speakers and non-native listeners, the vast majority of clear speech study has investigated only the acoustic and articulatory correlates of adapting to less-proficient listeners. In these situations, the entire realm discourse features usually studied under the domain of audience design, such as word choice, lexicon complexity, syntactic complexity, etc, is less well understood. This present investigation is a first step towards a study of intra-talker variability in audience design when addressing native and non-native speakers of English. This investigation focuses primarily on the size and makeup of the discourse lexicon, as well as the degree and extent of adjective modification.

Methods

This study makes use of the newly christened Wildcat Corpus of Accented English from Northwestern University (Bradlow et al. 2006). Two conversations were taken from the database for analysis. Each conversation takes place over the course of a map task, in which one of a pair of participants attempts to arrange items on a map (the Receiver) based on instructions given by the other (the Giver). In one conversation, a native English-speaking undergraduate student (21 years old from Wisconsin) gives instructions to another native English-speaking undergraduate student (19 years old from New York). In the second conversation, the same native English-speaker as before gives instructions to an English-L2, native Korean graduate student listener. The two conversations analyzed in this present study were specifically selected because the same native English-speaking individual was an interlocutor in both. Having the same speaker involved allows for a stronger standard of comparison between the two conditions: talking with a native listener and talking with a non-native listener.

The task was performed in a sound-attenuated chamber, and each speaker was digitally recorded on a unique microphone, with the two streams combined into one stereo file, sampled at 22.05 kHz. After recording, the conversations were orthographically transcribed for assessment (see Appendix A – Conversations).

The lexicon of the Giver within the discourse was analyzed by counting the total number of words uttered across the course of the task. Hesitations, false-starts, and non-words were not included in the analysis. Words that were cliticized, contracted, or otherwise inflected were considered only one word. This value was the number of unique *tokens* in the lexicon. Once the total tokens were established, any duplicate tokens were removed to determine the total number of *types* of words used by the Giver. Words that were inflected (e.g. do / does, runs / running) or contracted (it / its, we / we're) were considered repeat instances of the same token. Special consideration was not made for semantic referent, and words such as "block" that may have referred to two unique referents (a cube or a length of street) were collapsed into one token.

After the overall lexicon was established, it was subdivided into the distribution of content words. Content words were nouns, adjectives, verbs, or adverbs that contributed to identifying specific referents in the discourse. Pronouns, complementizers, determiners, prepositions, and discourse markers were excluded from the domain of content words. Once the total number of tokens of content words was established, content words were assessed for type in the same fashion as the entire lexicon. Finally, the frequency and familiarity of the words in each subset of the lexicon were measured using the Hoosier Mental Lexicon (Nusbaum, Pisoni & Davis 1984).

The conversations were also analyzed for distribution of adjectival modification. A count was made of the number and degree of adjunct adjectival modification of nouns or pronouns.

This included adjectives that directly modified a noun or pronoun (e.g. "the <u>other house</u> with the <u>green roof</u>" or "no the <u>red one</u> but the <u>purple one</u>."), but not those that modified a noun as a predicate (e.g. "the roof that <u>is green</u>," or "it's <u>wooden</u>.")

Results

Lexicon Size and Distribution

Overall, the Giver (N3) had a larger lexicon when talking to the non-native speaker (K3) than when talking to the native speaker (N2). However, the relative number of types and tokens did not differ significantly across the two lexicons [χ^2 (1,1479) = 2.38, n.s.], nor did the relative number of types and tokens of content words differ [χ^2 (1,688) = 0.08, n.s.] Likewise, the distribution of content word tokens relative to total word tokens did not differ across the two conditions [χ^2 (1,322) = 0.08, n.s.]. The difference in distributions of content words to overall words uttered approached significance [χ^2 (1,1157) = 3.25, p < 0.10] across two conditions, with a slightly larger ratio of content words to function words in that native condition. The size and distribution of words in the Giver's lexicon are summarized in Table 1, below.

Table 1 – Giver's Lexicon

		Lexicon			
		All		**Content Words**	
Language	**Task**	**Tokens**	**Types**	**Tokens**	**Types**
N3-N2	Map 2 Giver	448	140	199	91
N3-K3	Map 1 Giver	709	182	277	121

The frequency and familiarity of the words in the two lexicons were also systematically assessed via the Hoosier Mental Lexicon (Nusbaum, Pisoni & Clark 1984). The log frequency scores for all words uttered (types) did not differ between the two conditions (t-test, 2-tailed, p = 0.34) (see Figure 1), nor did the familiarity scores differ across all types (t-test, 2-tailed, p = 0.60). Likewise, the log frequency scores or familiarity scores for content words

alone did not differ across the two conditions (t-test, 2-tailed, p = 0.24 and p = 0.71, respectively) (see Figure 2).
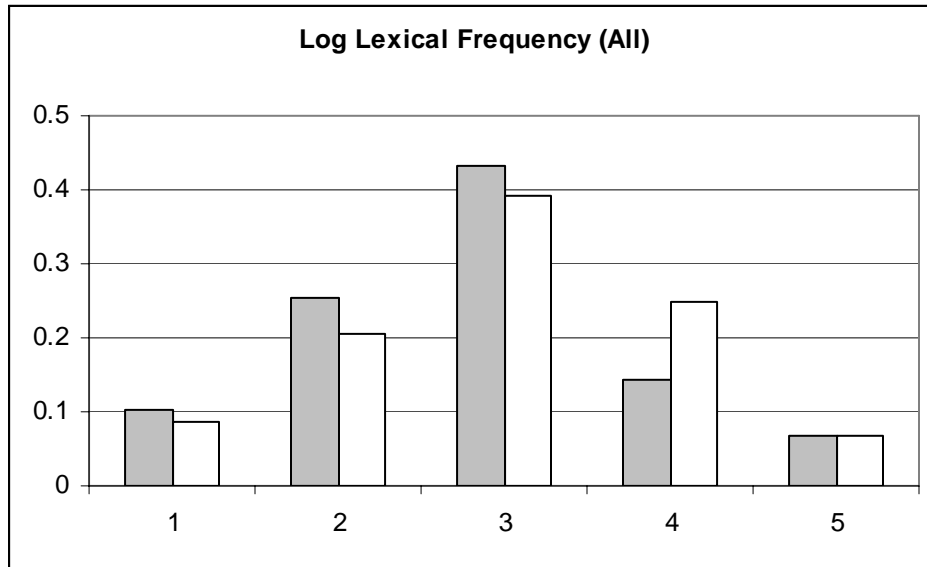

Figure 1 – Histogram of Log Lexical Frequency of All Types – Shaded bars indicate native to native condition, empty bars are native to non-native condition.
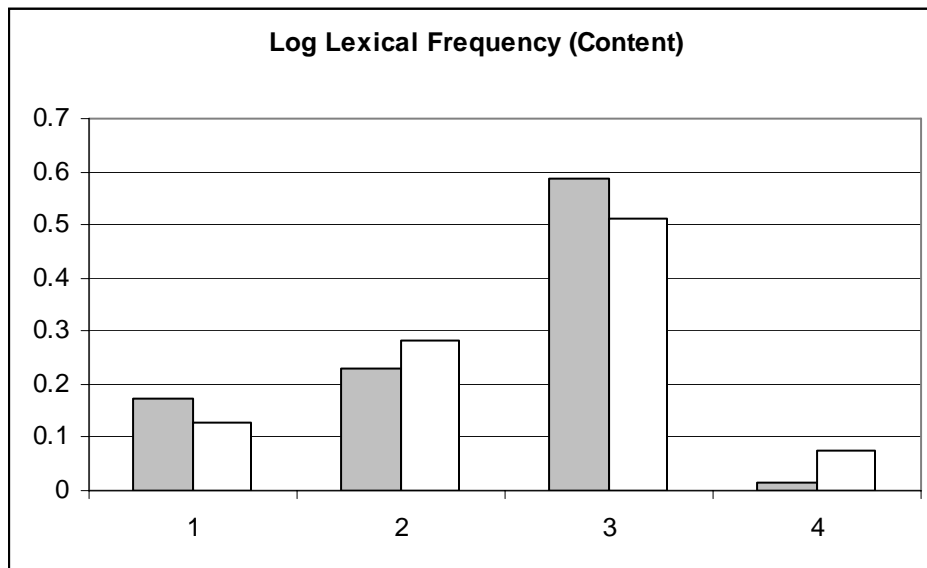

Figure 2 – Histogram of Log Lexical Frequency of Content Word Types– Shaded bars indicate native to native condition, empty bars are native to non-native condition.

Adjective Modification

The degree and types of adjective modification were also systematically assessed. The results of the adjunct adjective measurements are given in Table 2, below.

Table 2 – Degree of Adjunct Adjective Modification

Language	Task	Adjective Modifiers			
		0	1	2	3
N2-N3	Map 2 Giver	38	20	8	2
N3-K3	Map 1 Giver	65	33	5	2

Although the Giver used many more words (modified or unmodified) when talking to the non-native, there was not a significant difference in the distribution of adjectival modifiers across the two conditions [$\chi^2(1,173) = 3.19$, n.s.].

Discussion

With regards to size and quality of the lexicon and degree of adjective modification, it appears that the difference between communicative styles used by the present talker when talking to native speakers or non-native speakers did not differ substantially. The most prominent difference between the two conditions was simply the amount of speech produced by the Giver, with much more being said to the non-native speaker than the native one. A qualitative reading of the transcripts reveals that this difference might be motivated by greater repetition and efforts and grounding reference by the Giver in the non-native condition than in the native condition. That is, the Giver appears to make additional references to locations on the map and in space in the non-native condition, perhaps in order to ensure that the location conveyed by his message was getting across. This includes greater references to both locations pre-drawn on the map (e.g. Hude Street) and objects that had been placed by the Receiver earlier in the conversation. Additionally, part of the greater quantity of speech produced in the non-

native condition could be driven by meta-discourse between the Giver and Receiver when confusion occurred.   Likewise, in the non-native condition, the Giver summarized the overall map at the end to make sure they had set everything correctly, an undertaking he did not attempt in the native condition. Also driving the larger amount of speech produced by the Giver in the non-native task was the fact that he had undertaken this condition first. This experience could have facilitated the efficiency with which he completed the task the second time, when a native listener was present.

Regardless of the quantity of speech produced, it is interesting that the quality of speech from a lexical standpoint did not differ between the two conditions. That is, the Giver produced lexicons with similar frequencies and familiarities, as well as degrees of adjectival modification, in both conditions. The Giver, then, did not select words that he thought would be easier for the Receiver to understand when the receiver was a non-native-speaker of English, nor did he engage in more complex discourse when speaking with a native speaker. Although examinations of the histograms in Figures 1 & 2 suggest a trend toward using higher-frequency words in the non-native listener condition, this trend was not statistically significant. This could be motivated by a number of factors, including the speaker's familiarity with talking to non-native listeners, the high degree of fluency of the non-native listener, or the priming experience from having completed the non-native task first when talking to the native speaker. Additionally, the apparent lack of difference in lexical frequencies could be a factor of second-language education, in which high-frequency, high-familiarity words for native-speakers are not necessarily taught first. (For example, many non-native speakers say *clever*, which is relatively low frequency in English, and, anecdotally, other high-familiarity words that are learned early in one's native language, e.g. *barn* and other farmyard terms, are learned late, if at all, in a non-native language).

Although the present case study failed to show tailoring for audience design in the speech of a native speaker when addressing a native or non-native speaker, it does not preclude this being a possibility. Other forms of complexity remain unanalyzed, including other sentential modifiers such as adverbs and relative clauses. Qualitatively, a reading of the transcript suggests that substantially more prepositional phrases, either of locative or compositional, were used to identify objects in the non-native condition of the map task.

Future studies, including studies with larger samples of the corpus, are necessary to determine there is no natural difference in audience design when native speakers are addressing non-native speakers. Task order, including especially intertask priming effects, and participant fluency need to be systematically controlled for. It may be such that, in natural speech, individuals do not tailor their discourse to the lexical or syntactic demands of their audience, although they do make other articulatory and phonetic alterations. In such a case, two additional conditions would need to be considered: one in which individuals were directed to speak in a clear and straightforward manner to facilitate the comprehension of their non-native interlocutor, and another in which they were allowed to speak naturally without investigator-suggested bias.

References

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