Presenting in English or Swedish: Differences in speaking rate

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Abstract
This paper attempts to quantify differences in speaking rates in first and second languages, in the context of the growth of English as a lingua franca, where more L2 speakers than ever before are using English to perform tasks in their working environments. One such task is the oral presentation. The subjects in this study were fourteen fluent English second language speakers who held the same oral presentation twice, once in English and once in their native Swedish. The temporal variables of phrase length (mean length of runs in syllables) and speaking rate in syllables per second were calculated for each language. Speaking rate was found to be 23% slower when using the second language, and phrase length was found to be 24% shorter.

Introduction
As English continues its growth as a lingua franca, more and more speakers across the world find themselves in front of an audience that needs to hear the speaker’s message in a language that neither speaker nor listener is entirely comfortable with. One reason for the discomfort can be traced to the extra time it takes to formulate one’s message in a second language (L2). Slower English speakers in business meetings can have difficulty taking the floor from native speakers (Rogerson-Revell, 2007) and international students may be frustrated by their ability to formulate responses quickly enough to contribute to classroom discussion (Jones, 1999). Though researchers have begun to explore the effect of L2 language use in interactive situations such as the meeting or the seminar, the ramifications of slower L2 speaking rate when holding an instructional monologue, such as a presentation or a lecture, have not been explored.

Conveying information to an audience in an L2 can be a difficult experience for many reasons. Teachers complain that they are less able to be spontaneous, but they may not understand themselves that they require a bit more time to produce the same linguistic content. In general, little is known about how the use of a second language affects vital issues such as the speaker’s ability to engage the audience and to adequately cover the intended content in the time allotted for the presentation or lecture. Temporal features—particularly speaking rate—can have an influence on both abilities.

Temporal variables have previously been explored from the L1 perspective, the L2 perspective, and various interfaces between them. The work that has been done has been carried out in an attempt to study the cognitive processes underlying linguistic production (Goldman-Eisler, 1968), to understand language typology (Grosjean & Deschamps, 1973), to support a theoretical model for the process of second language acquisition (Towell, Hawkins, & Bazergui, 1996) or for tools in language assessment (Rekart & Dunkel, 1992). The present study is motivated by other needs that could be described as pragmatic rather than theoretical. We are now in a situation, at least in Europe, where more speakers than ever before are carrying out their daily business in a second language, English. The fact that speakers speak more slowly in a second language may be obvious but it is not trivial in the globalizing world. The question asked here is simply how much speakers can be slowed down by working in a second language.

This research builds on earlier work (Hincks, 2005a and 2005b) which examined a smaller database of five speakers making dual lingual presentations. Those five speakers form part of this study as well, but their recordings have been augmented with nine new speakers to create a more reliable subject group. The first study looked at two primary variables: speaking rate and pitch variation. The present study omits pitch variation, saving that aspect for a future study. The 2005 results showed large differences in speaking rate, which have been confirmed by testing on a larger group.
Method

Working at the syllable rather than word level is a necessity for any kind of cross-linguistic study; although Swedish and English are closely related languages, they use different orthographic conventions. An assumption is made that the information content of syllables is equivalent when comparing genetically related languages such as English and Swedish. This study uses the second rather than minute as the length of time, and speaking rate (SR) is thus expressed in syllables per second (sps).

Another variable that has been found to be relevant in the study of speaking rate is what is known as the mean length of runs (MLR)—what could also be called phrase length, or the amount of speech, in syllables, between pauses. The MLR will generally be shorter in L2 speech than in L1 speech (Kormos and Dénes 2004), and in that way give an indication of the frequency of pauses in the speech. Different pause lengths have been used to define the boundaries of the phrases, but most studies have used a length between 200 and 300 milliseconds. This study uses a length of 250ms, or one quarter of a second.

The fourteen subjects for this study, six women and eight men, were all Swedish native students of engineering at KTH, taking an elective course in Technical English. They had taken a written diagnostic test upon application to the language department, and had been placed in either the Upper Intermediate (B2+) (10 subjects) or Advanced classes (C1) (4 subjects). The English oral presentations were recorded in the second half of the 56-hour courses, so that students had had plenty of time to warm up any rusty spoken English. The Swedish oral presentations were made outside of class, using the same visual material and before a smaller audience.

The 28 presentations were carefully transcribed in a three-step process. First the entire presentation was orthographically transcribed, including filled pauses. Speech recognition was a helpful tool in the English transcriptions. The speaker-dependent dictation software Dragon NatSpeak 9 was trained to the researcher’s voice, who then repeated the presentations into the dictation program. A complete, though somewhat inaccurate, transcription could be produced in real time—10 minutes for a 10-minute presentation. Listening to the transcription two or three more times allowed for correction of the inaccuracies and addition of the filled pauses that the speech recognition is trained to ignore. The vocabulary of the dictation software was impressive, including Swedish place names and rare words such as types of pharmaceuticals and phenomena (e.g. quantum teleportation). Swedish personal names were, however, more problematic.

The second phase of transcription, which allowed further correction to any eventual inaccuracies, was to break the transcriptions into phrases, using pauses as boundaries. The speech waveform was used to locate all silent or filled pauses longer than 250 milliseconds.

Finally, in the third phase of transcription, each phrase was broken into syllables by inserting spaces to represent syllable boundaries. Filled pause markings were first removed so that they would not be counted as syllables. The total number of syllables was divided by the length of the presentation in seconds to find the speaking rate.

Results

Table 1 presents the mean length of runs, the total number of syllables, the total speaking time, and speaking rate.

Phrase length (MLR)

All speakers used shorter phrase lengths in English than in Swedish. The means were 12.59 syllables per phrase in L1 and 9.51 syllables per phrase in L2, a mean difference of 3.08, SD 2.15. This shorter length in L2 is statistically significant: $t (13) = 3.10, p < .01$, one-tailed. The phrase lengths by speaker correlate strongly between languages: $R=0.82$.

Speaking rate

The mean SR for L1 was 3.89 sps (SD .61), and in L2 3.12 sps (SD .46). The slower speaking rate in L2 is statistically significant: $t (13) = 3.438, p < .01$, two tailed. This can also be expressed as a mean difference of 20.8%, where L2 is 23% slower than L1, and L1 is 18.7% faster than L2. As expected, all speakers spoke more quickly in L1: at least 3 sps, with three speakers approaching a speaking rate of 5 sps. In L2 the rates range from a low of 2.37 sps to a high of 4.12 sps. The SRs between languages correlate strongly, $R=0.85$. They also correlate by speaker with phrase length: 0.82 for L1, and 0.89 for L2.
Table 1. The mean length of runs between pauses of >250 ms, the total number of syllables in the presentation, the total seconds of speech, and the speaking rate in syllables per second.

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Mean length of runs (syllables)</th>
<th>Total Syllables</th>
<th>Total Time (seconds)</th>
<th>Speaking Rate (syll/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Swedish L1</td>
<td>English L2</td>
<td>Swedish L1</td>
<td>English L2</td>
</tr>
<tr>
<td>S1(M)</td>
<td>11.57</td>
<td>6.40</td>
<td>2244</td>
<td>2272</td>
</tr>
<tr>
<td>S2(M)</td>
<td>10.98</td>
<td>6.94</td>
<td>1383</td>
<td>1534</td>
</tr>
<tr>
<td>S3(M)</td>
<td>8.94</td>
<td>7.09</td>
<td>1225</td>
<td>1318</td>
</tr>
<tr>
<td>S4(F)</td>
<td>10.55</td>
<td>8.00</td>
<td>1889</td>
<td>1568</td>
</tr>
<tr>
<td>S5(M)</td>
<td>11.49</td>
<td>8.23</td>
<td>2367</td>
<td>1844</td>
</tr>
<tr>
<td>S6(F)</td>
<td>8.84</td>
<td>8.45</td>
<td>1538</td>
<td>1369</td>
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<td>9.23</td>
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<td>1938</td>
</tr>
<tr>
<td>S9(M)</td>
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<td>2411</td>
<td>1797</td>
</tr>
<tr>
<td>S10(M)</td>
<td>14.79</td>
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<td>2487</td>
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<td>12</td>
<td>3502</td>
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</tr>
<tr>
<td>S14(F)</td>
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<td>15.34</td>
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<td>2025</td>
</tr>
<tr>
<td>SD</td>
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<td>2.38</td>
<td>820</td>
<td>446</td>
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<tr>
<td>Mean</td>
<td>12.59</td>
<td>9.51</td>
<td>2137</td>
<td>1879</td>
</tr>
</tbody>
</table>

Discussion

Both similarities and differences between the L1 and L2 presentations have been revealed by this examination of two temporal variables: the amount of speech uttered between pauses (MLR), and the speaking rate (SR), including pauses, over 6-14 minutes. To begin with the similarities, there is a strong effect of individual speaking style between the two languages. The correlations between L1 and L2 of 0.82 (SR) and 0.85 (MLR) show that those speakers who used shorter phrase lengths and slower rates of speech in one language used them in the other language as well, confirming previous work done on laboratory speech (Deschamps, 1980; Raupach, 1980; Towell, Hawkins, & Bazergui, 1996). Though other researchers have suggested using phrase length to measure fluency in second languages, it is important to recognize that phrase length differs in one’s first language as well.

The main research issue addressed here was an attempt to quantify the effect on speaking rate of using an L2 in the oral presentation situation. Using English instead of their native language meant that all speakers had shorter phrase lengths and slower rates of speech. On average, using English slowed the speakers down by 23%. The difference can be attributed to the frequent short pauses—as evidenced by the shorter phrase lengths—that are necessary for the speakers to find the formulations they need in L2. A long phrase length shows that linguistic knowledge has been proceduralized (Levelt, 1989; Towell, Hawkins, & Bazergui, 1996). The subjects in this study, though they were speaking about material they themselves had prepared and were fluent speakers of English, show the degree to which operating in a second language affects the cognitive processes underlying speech production.
Conclusion

Recommendations

The slower speaking rates shown in this study do not necessarily pose a problem when the speech in question is instructional speech. When both speakers and listeners are operating in a second language, a speaking rate of about 3 sps is probably appropriate. However, it is important for individual speakers and for policy-makers to understand and acknowledge the effect of using a second language on speaking rate, particularly when making a shift from doing a task one normally does in L1 to doing it in L2. If the rate of a delivery of a 45-minute lecture is slowed down by 25%, then the lecture will take closer to an hour to finish. Course plans and schedules need to be adapted to accommodate this, especially in light of the fact that research has shown that students tend to save their questions for after class when they are themselves operating in an L2 (Airey & Linder, 2006). Other measures that could be considered would include variable speaker time at conferences and other gatherings.

Further work

The next question to be asked in the study of the dual-language presentation database is to what extent using different languages affected the content of the presentations. Is the slower speaking rate a symptom of such linguistic difficulty that speakers omit information in L2 that they include in L1? It is beyond the scope of the present paper to investigate this question in detail, but it can be said that an initial study comparing the propositional content of the fourteen pairs of presentations finds a slight but not overwhelming advantage for the L1, especially when the presentations are normalized for time. Further differences appear in the meta-discourse with which the speakers structure their presentations, and the extent to which they elaborate on the content. These issues will be the subject of forthcoming work.

References


