

THE EFFECTS OF SPEAKING RATE ON THE COMPREHENSIBILITY OF NATIVE AND FOREIGN-ACCENTED SPEECH

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1. INTRODUCTION

This study assessed the effects of speaking rate on local and global aspects of second language (L2) speech production. Since previous research has suggested that a reduced speaking rate may improve the intelligibility of L2 speech, it was proposed (Hypothesis 1) that the difficulty L2 learners often have in producing accurate phonetic targets is due in part to insufficient time to execute good productions. If so, learners might show more intelligible vowel targets when speaking at a rate slower than normal. The second proposal (Hypothesis 2) was that the perceived global comprehensibility and accentedness of L2 connected speech may improve at a slower speaking rate. To test these hypotheses, we carried out two experiments in which native English listeners identified and evaluated productions of L2 learners.

2. METHODS AND RESULTS

Speakers. Recordings were made of 10 high-proficiency adult native speakers of Mandarin (5 female, 5 male). All had been born in China and had moved to Canada after the age of 21. Informal evaluation indicated that their accents ranged from moderate to strong. A comparison group of 10 native speakers of Canadian English was also recruited.

Recordings. Two types of speech samples, front vowel productions and a short reading passage, were collected from each speaker. The vowels were elicited in bVt words ("beat," "bit," "bait," "bet," "bat") in the carrier sentence, "Now I say ____." The speakers read the carrier sentences first at a normal speaking rate and then at a rate one half as fast as normal. The individual bVt tokens were digitized, the final [t] portion was removed from each token, and a randomized presentation tape was prepared. An ANOVA indicated that the CVs produced in the slow condition were significantly longer ($p < .05$) than the CVs produced in the normal condition (208.0 msec vs. 192.9 msec respectively). The effect was uniform across vowels.

The reading passage was also recorded at two speaking rates. From each production, the first two sentences (18 words) were digitized, and a second randomized tape was prepared. Duration measurements indicated that, while both groups slowed down significantly ($p < .05$), the English speakers produced the slow passages at a rate 69% of normal

while the Mandarin speakers produced them at a rate 76% of normal.

Vowel Identification Task. Thirty-eight native English listeners listened to the stimulus tape, and circled which of the five words they heard on a response sheet. ANOVAs on the vowel identification data (%-correct ID) for each listener indicated that overall, the Mandarin speakers produced less intelligible tokens of all words except "bait." No effect of speaking rate was observed on the identification rates for "beat," "bait," and "bat." However, the Mandarin speakers' productions of "bit" and "bet" were correctly identified at significantly higher rates in the slow condition than in the normal condition. Thus, Hypothesis 1 was partially confirmed.

Rating Task (Reading Passage). Seventeen native English listeners evaluated the passages on two 9-point scales: comprehensibility ("1" = very easy to understand, "9" = very difficult to understand) and accentedness ("1" = no accent, "9" = very strong accent). An analysis of mean ratings for each listener revealed that the Mandarin speakers' utterances were judged to be less comprehensible and more accented overall than the utterances of the native English speakers. There was no overall effect of speaking rate on comprehensibility for either group of talkers. However, the Mandarin speakers' passages were judged to be significantly more accented in the slow condition than in the normal condition ($M = 6.1$ vs. $M = 5.8$, respectively). Therefore, Hypothesis 2 was not supported and was, in fact, partially contradicted.

3. CONCLUSIONS

While these results indicate that the intelligibility of local phonetic targets may sometimes improve when L2 learners articulate slowly, they do not support the proposal that slowing down improves global comprehensibility. In fact, the passages produced at the slow rate in this study were judged to be more accented than those produced at the normal rate. It appears then that, in the slow reading passages, any improvement in the production of phonetic targets was either not detected by the listeners or was offset by some other factor, such as reduced fluency. It is clear that research of this type needs to be extended to cover other types of speech samples and other types of rate adjustments.