Hesitation Phenomena in English by Japanese Speakers: Preliminary Results from a Cross-linguistic Speech Corpus

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Abstract

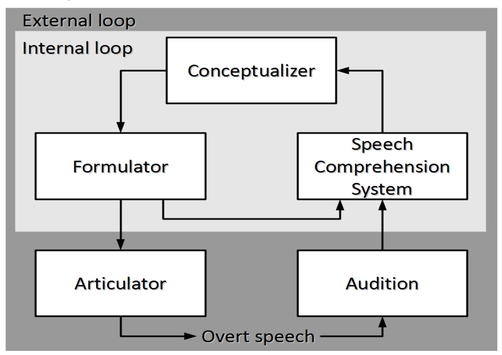
While much work on second language (L2) speech has yielded a greater understanding of hesitation phenomena (HP), many works have not taken into account the individual's performance in their first language (L1). This presentation reports on an in-progress large-scale project designed in part to address this gap. The project involves the construction of a cross-linguistic corpus of speech by participants doing parallel speaking tasks in their L1 and L2. Annotation has so far focused on hesitation phenomena (e.g., pauses and repairs) and results suggest a L2 developmental trajectory against which learners might be evaluated. In particular, results show that speech rate, silent pause frequency and duration are correlated with L2 proficiency (as has been previously observed), but that speech rate and silent pause duration may be the result of individual variation. Results also show the novel observation that acoustic features of filled pauses are also correlated.

Background

Hesitation phenomena in spontaneous speech

Research on L1 production shows that spontaneous speech contains a variety of HP (Maclay and Osgood 1959): silent pauses, filled pauses (*uh*, *um*), false starts, restarts, repeats, self-corrections, and lengthenings (*we:ll*, *a:nd*).

Levelt's (1983) monitor theory of speech production accounts for the production of much HP by positing internal and external perceptual loops which allow the speaker to detect speech errors before as well as after they are spoken. Errors noticed in the internal loop may be repaired covertly with only an overt sign of hesitation. Kormos (1999, 2000) extends this model to analyze repairs in L2 production.



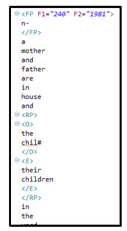
HP in L2 speech production

Studies of L2 speech show that as learners become more competent in L2, they speak with a higher speech rate (Cucchiarini et al 2010, Wu 2008, but see Trofimovich and Baker 2006, 2007), they use longer and more silent pauses (Cucchiarini et al 2010, Riazantseva 2001, Tavakoli 2011) and they use more filled pauses (Rieger 2003, but see Wu 2008). However, one possible critique of most studies in this area is that they have not fully taken into account high individual variation in hesitation patterns: Many studies of L2 speech have not gathered an L1 sample for baseline comparison. The present research effort attempts to do this.

Cross-linguistic Corpus of Hesitation Phenomena

Corpus construction

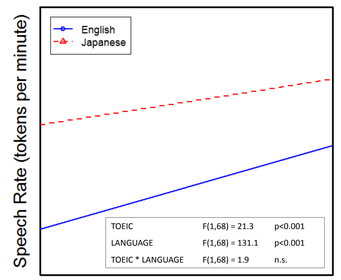
Participants	Elicitation tasks	Demographic information	Annotation
10 adult native speakers of Japanese	• Spontaneous speech: picture description and topic narrative • Reading aloud (cf., Cucchiarini et al 2010)	• Age • Gender • L2 proficiency information (ETS TOEIC: Test of English for International Communication)	• Spoken word transcription • HP: silent pauses, filled pauses, repair and repeat sequences • Word and pause intervals • F1, F2 measurements for FPs

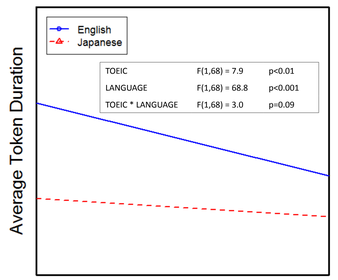


Results

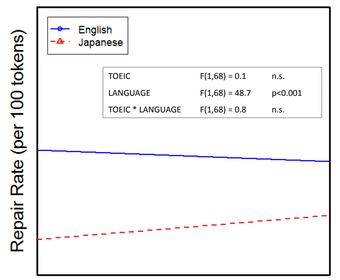
Fully annotated part of corpus consists of 7,237 words in 71.7 minutes. However, analysis below includes data from spontaneous speech only (4,191 words; 47.7 minutes).

Tokens

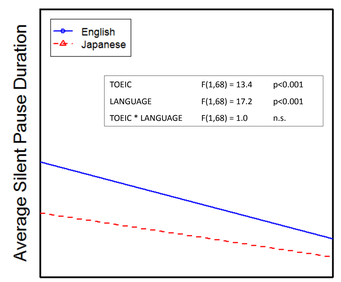


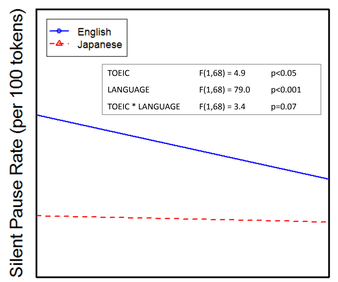


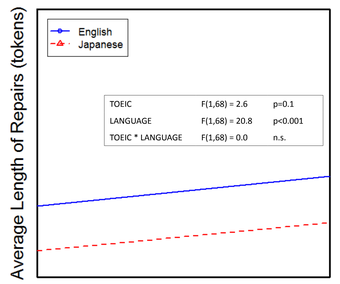
Repairs (self-corrections, restarts, repeats)



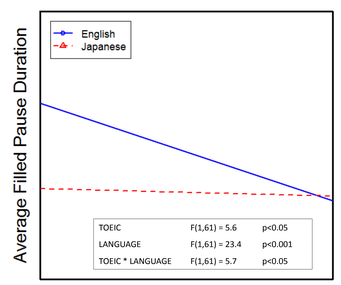
Silent Pauses (duration >= 0.3 sec)

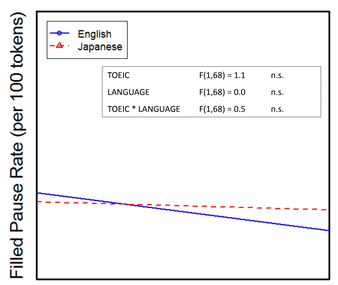


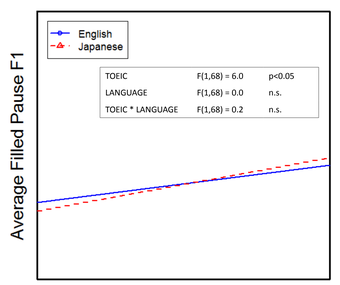




Filled Pauses







Discussion

Results from the CCHP suggest the following L2 developmental trajectory for hesitation phenomena.

Low-level speakers have limited productive vocabularies and little automaticity in utterance construction. Therefore, their linguistic cognitive processing burden is very high. They speak more slowly than in L1 (tokens per minute) by articulating words longer than in their native language, and using a variety of hesitation strategies: longer silent pauses, more silent pauses (per token—thus, shorter runs), longer filled pauses, and more and longer repairs. They do not increase their filled pause rate (per token). They use a filled pause phonetic form that is closer to L1 forms in vowel height (F1). Phonological encoding and outer speech monitoring are disengaged during silent pauses, so this allows greater effort on lower-level speech processing.

High-level speakers have large(r) active vocabularies and high automaticity in utterance construction. Therefore, they speak faster by using fewer silent pauses for hesitation purposes, not pausing as long, and by speaking individual words faster. They use shorter filled pauses, but no fewer (contra Rieger 2003). They may also use other hesitation strategies not yet studied in this corpus (e.g., lexical fillers; cf., Rieger 2003).

Results further suggest that the speech rate duration and silent pause effects are not really strong factors in development, but rather are the result of individual effects. In other words, it could be that only learners who speak faster and pause shorter become high-level L2 speakers.

This trajectory parallels the trajectory that has been found to influence judgments of L2 fluency: decreasing silent pause rate and duration (Anderson-Hsieh and Venkatagiri 1994, Kang 2010, Kormos and Dénes 2004, Rose 2011). However, filled pauses do not influence fluency judgments (Kang 2010, Rose 2011).

Future work for the CCHP includes annotation of part-of-speech information, clause structure, and syllable and phoneme intervals.

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