An Evaluation of Hesitation Phenomena as Measures of Second Language Proficiency and Fluency

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Overview

- Hesitation phenomena
  - Overview
  - HP in L2 speech
- Views of Fluency
- Crosslinguistic Corpus of Hesitation Phenomena
  - Description
  - Results
- Implications and Applications
- Accessing the CCHP

Overview of types of HP

- Long investigative history
  - Goldman-Eisler 1961, Levelt 1989, Maclay and Osgood 1959, Rochester 1973, inter alia
- Types
  - Silent pauses (SP): longer than 0.3-1.0 sec
  - Filled pauses (FP): *uh*/*um* in English, *e-to*/*ano*- in Japanese
  - Lengthenings: prolongation of one or more syllables
  - Repeats/restarts: repetition of a sequence of words
  - False starts: beginning of an utterance that is abandoned
  - Self-corrections: a sequence of words that repairs an immediately preceding sequence
  - Lexical fillers: various fixed expressions used as hesitation devices

HP in L2 production

- Findings (Cucchiarini et al 2010, Kormos and Dénes 2004, Riazantseva 2001, Rieger 2003, Tavakoli 2011, Trofimovich and Baker 2006, 2007, Wu 2008)
  - SP duration and rate: higher proficiency → shorter and fewer silent pauses
  - FP rate: higher proficiency → fewer filled pauses
  - Distribution: low and high proficiency speakers show different distribution of HP use
  - Differences between read and spontaneous speech
- Related
  - Speech rate: higher proficiency → faster rate
  - Mean length of runs: higher proficiency → longer runs

HP in L2 production

- As a whole, work has been quite comprehensive.
- However, individual works are limited in that many do not take individual variation into account (cf., de Leeuw 2007).
  - Exception: Derwing et al (2009) observed that both speech rate and pause rate in L1 and L2 production are correlated.
- My current research is a partial attempt to address this issue.

Fluency

- Segalowitz (2010) taxonomy of fluency types
  - Cognitive fluency (in speech planning)
  - Utterance fluency (in speech production/articulation)
  - Perceived fluency (from listener's perspective)
- De Jong et al (Forthcoming) investigated relationship between cognitive fluency and utterance fluency.
- De Jong and Perfetti (2011) – Nation's (1989) 4/3/2 technique leads to improved utterance fluency in short and long term.

Research Questions

- What is the developmental trajectory of HP use in L2?
- What is the relationship between hesitation patterns in L1 and L2 speech?
- What relationships are there between utterance fluency (i.e., measures of HP) in L2 speech and perceived fluency ratings or more general L2 proficiency?

Crosslinguistic Corpus of Hesitation Phenomena – pilot (CCHPp)

- Participants: L2 learners of varying proficiency levels
- Elicitation tasks
  - Spontaneous speech: picture description, topic narrative
  - Reading aloud
  - Performed in both L1 and L2
- Demographic information: age, gender, L2 proficiency (self-reported TOEIC score)
- Annotation
  - Transcripts, HP, word & pause intervals
  - Two annotators, one checker
- Native English speaker (N=16) ratings of fluency for L2 speech

CCHPp Results: Basic Statistics

- Participants: 10 Japanese L1, English L2 speakers
- Fully annotated parts of corpus
  - 7,237 tokens (words)
  - 71.7 minutes
- Spontaneous speech
  - 4,191 tokens
  - 47.7 minutes
- Read speech
  - 3,046 tokens
  - 24.0 minutes

- 1,420 silent pauses
- 456 filled pauses
- 203 self-corrections
- 70 repeats
- 8 false starts

CCHPp Results: Analysis

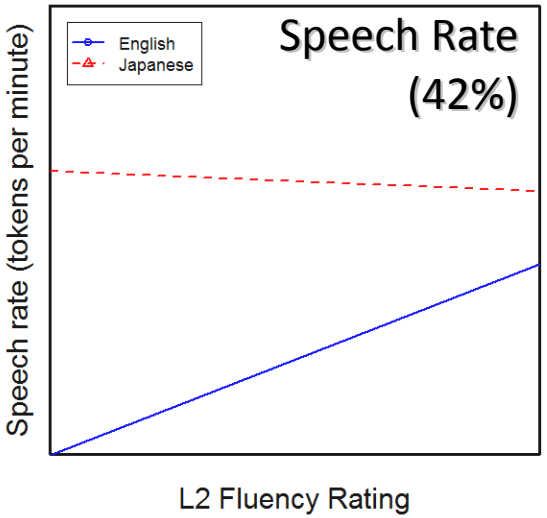
Factors

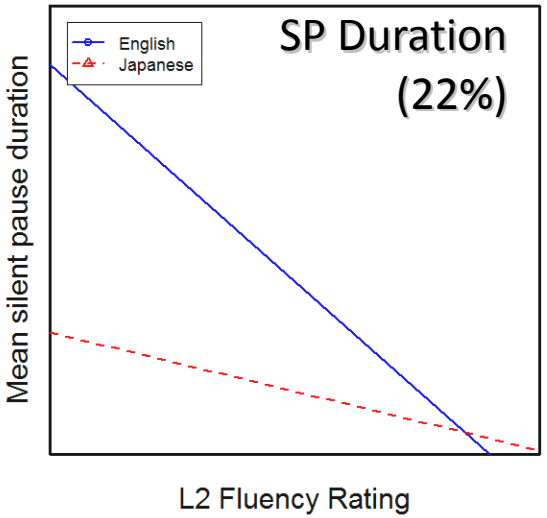
- speech rate
- mean SP duration
- SP rate (per 100 tokens)
- SP rate (per minute)
- mean FP duration
- FP rate (per 100 tokens)
- FP rate (per minute)
- mean length of runs

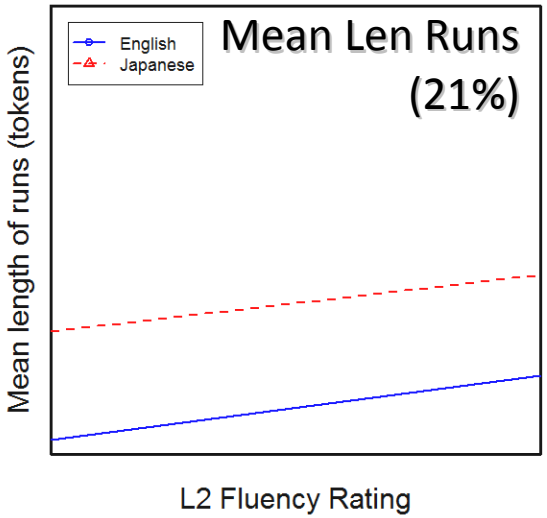
- Data collapsed by participant and L1-L2 difference was calculated
- Factors correlated with:
  - L2 Fluency Rating
  - TOEIC score
- Stepwise linear regression to find optimal combination of factors
- Data evaluated by
  - spontaneous speech
  - reading aloud

CCHPp Results: Spontaneous Speech

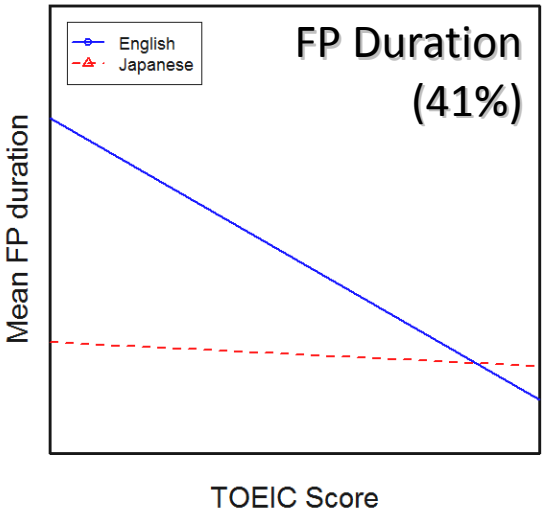
L2 Fluency Ratings ($R^2 = 0.82$)

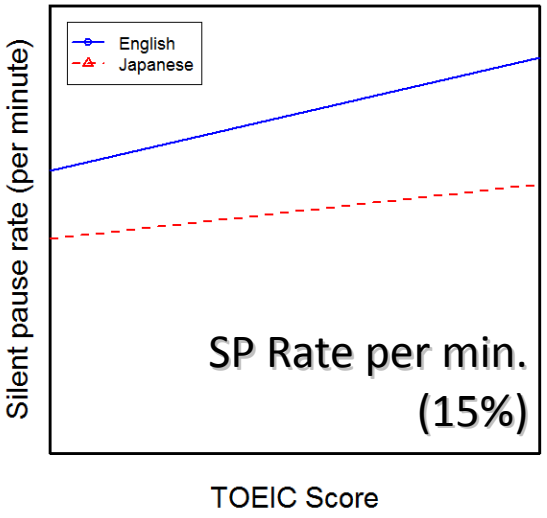


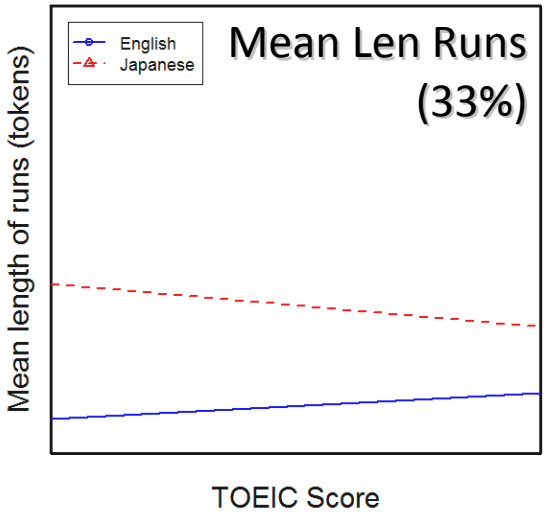




TOEIC Scores ($R^2 = 0.82$)

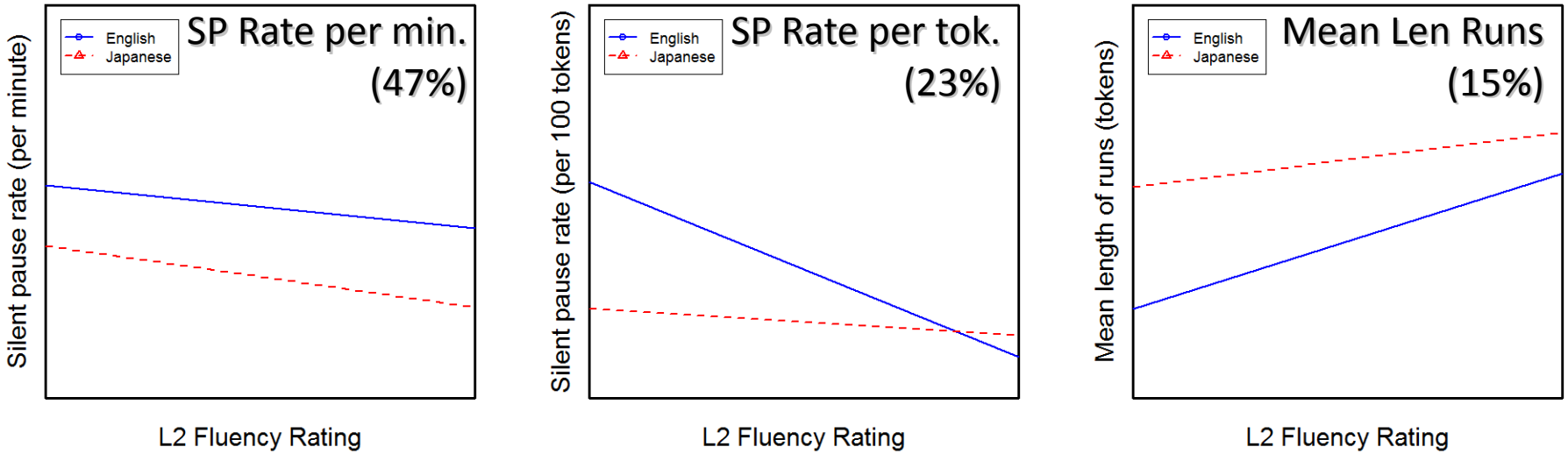




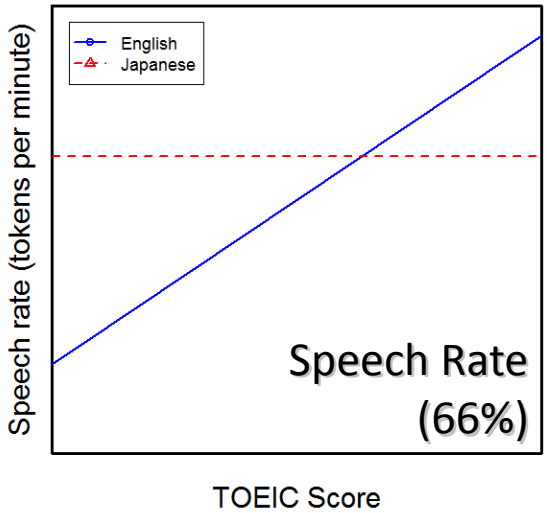


CCHPp Results: Reading Aloud

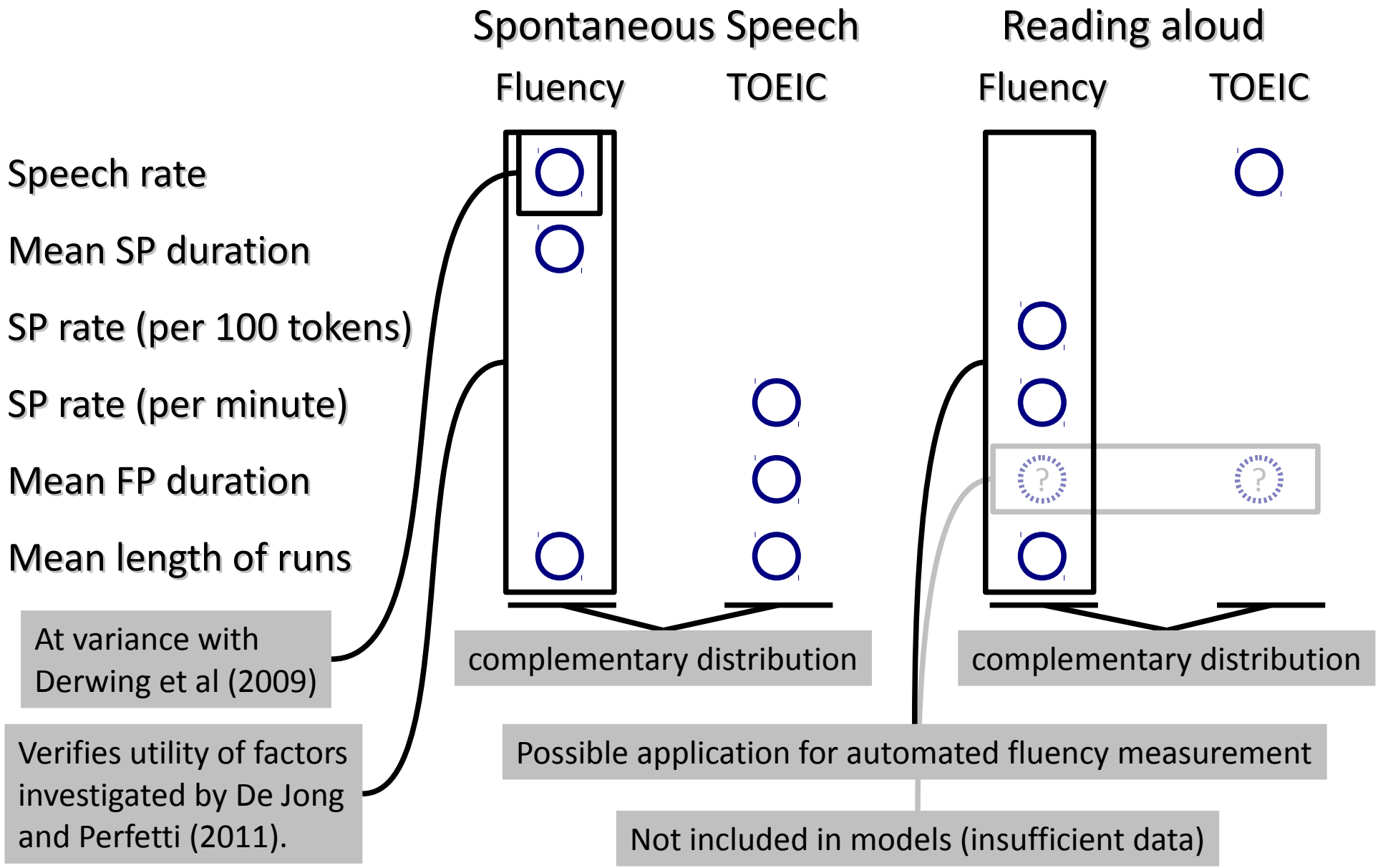
L2 Fluency Ratings ($R^2 = 0.77$)



TOEIC Scores ($R^2 = 0.61$)



CCHPp Results: Summary



Implications and Applications

- L2 oral fluency evaluation should focus on speech rate, SP rate and mean length of runs. Other correlating factors may be due to L1 speech characteristics.
- The 4/3/2 procedure (Nation, 1989)—already shown to effect gains in utterance fluency (De Jong and Perfetti, 2011)—may further effect gains in perceived fluency.
- A reading aloud task might be useful to evaluate fluency (focusing on SP rate and mean length of runs). This would be much easier to process than spontaneous speech.

Summary

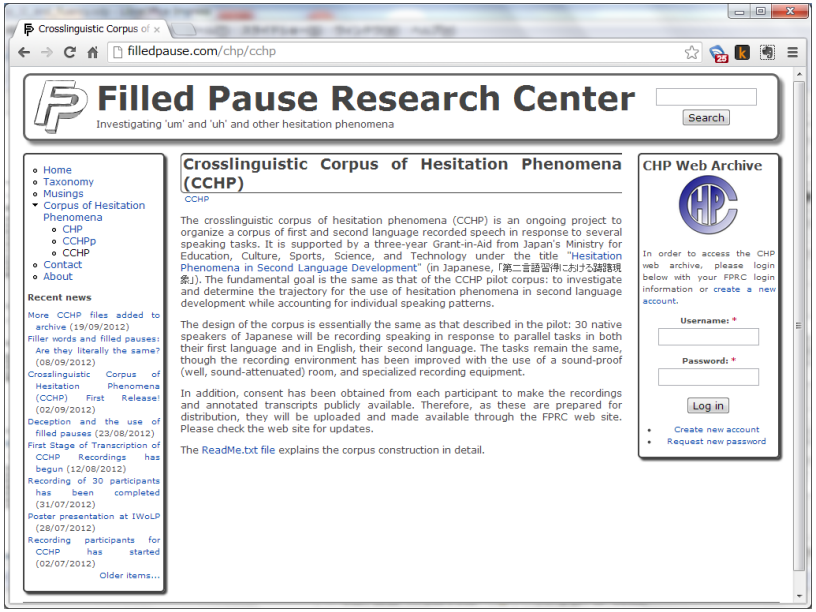
- While much progress has been made on the study of L2 oral fluency, L1 fluency factors have not often been taken into account.
- The Crosslinguistic Corpus of Hesitation Phenomena allows us to account for L1 factors in the study of L2 utterance fluency and perceived fluency.
- Results show that speech rate, silent pause duration and mean length of runs are factors that correlate well with L2 oral fluency, but not with overall L2 proficiency.
- Results suggest different methods for measuring fluency through spontaneous speech or reading aloud tasks.

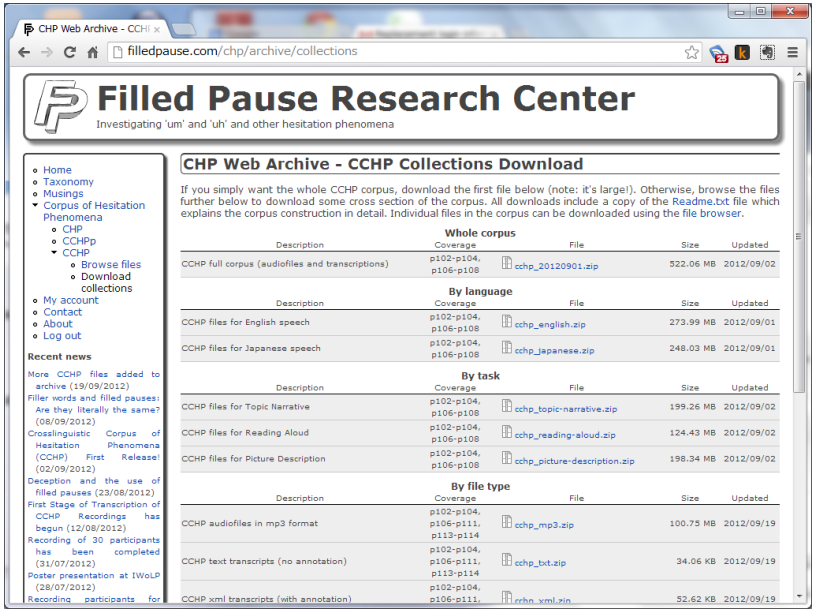
Further Work

- Repairs
  - Basic features of repairs (length, rate, etc.) did not correlate with oral fluency nor L2 proficiency at all.
  - However, other features might: clause location, linguistic structure of reparandum, type of repair (Levelt 1983, Kormos 1999)
- Filled Pauses
  - Only correlation was FP duration with L2 proficiency.
  - FPs are known to correlate with lexical frequency (Rose 2011) and contextual probability (Beattie and Butterworth 1979).
  - Check: effect of FP features on oral fluency is off-set by contextual lexical properties.

CCHP Public Corpus

- Assembling a larger (N=30), public version of the Crosslinguistic Corpus of Hesitation Phenomena is ongoing.
- When complete, audio files and annotated transcripts will be available for free download.
- Some files are already available for download: http://www.filledpause.com/chp/cchp





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