Temporal Variables in First and Second Language Speech and Perception of Fluency

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Fluency

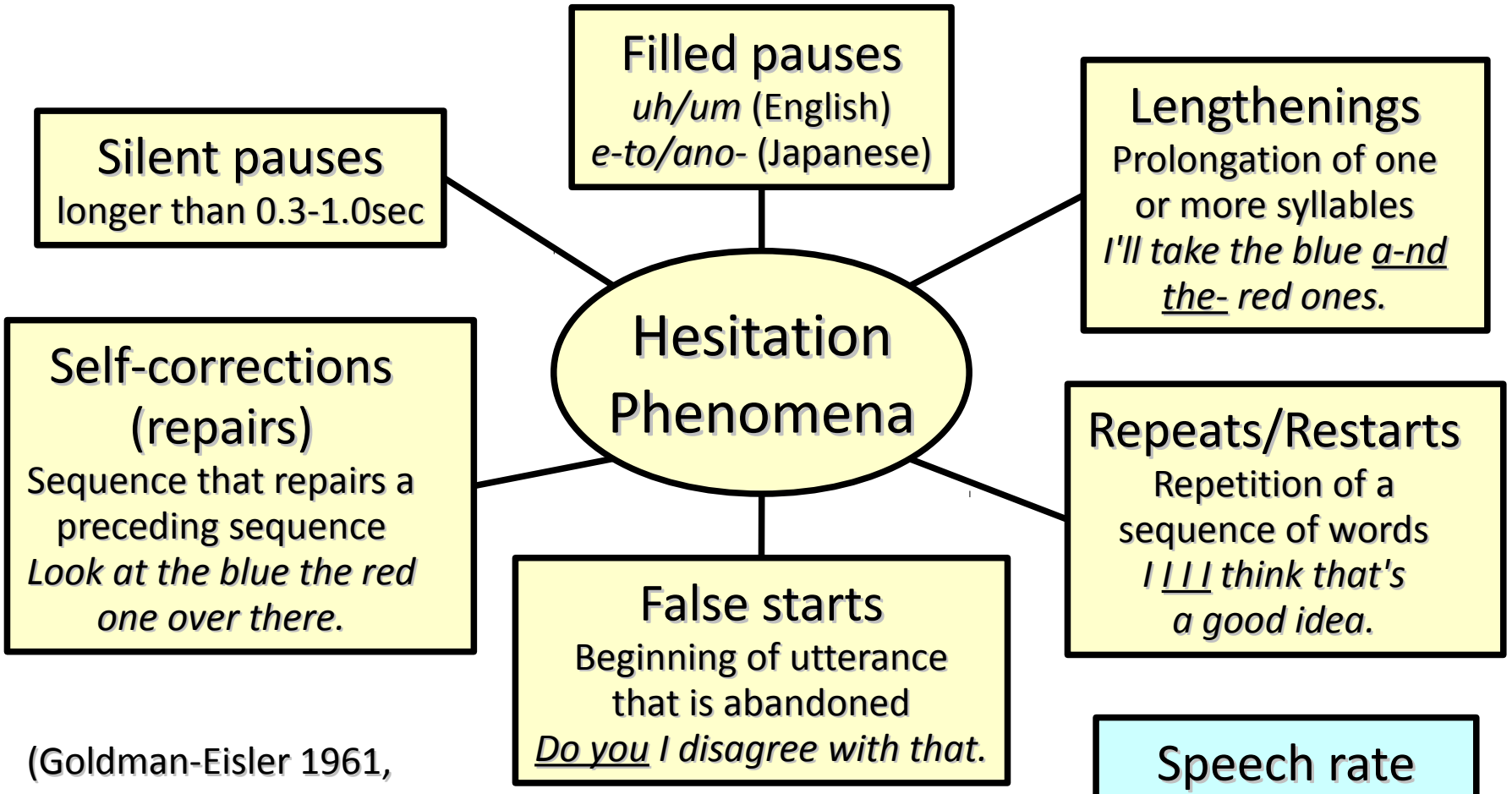
- Segalowitz (2010): levels of fluency
  - Cognitive fluency: ease of mental preparation
  - Utterance fluency: smoothness of articulation
  - Perceptual fluency: hearer's view of smoothness

De Jong et al (2012)

This study

- De Jong et al (2012) investigated relationship between cognitive fluency and utterance fluency.
  - L2 speech rate related to cognitive fluency
  - L2 Silent pause duration weakly related

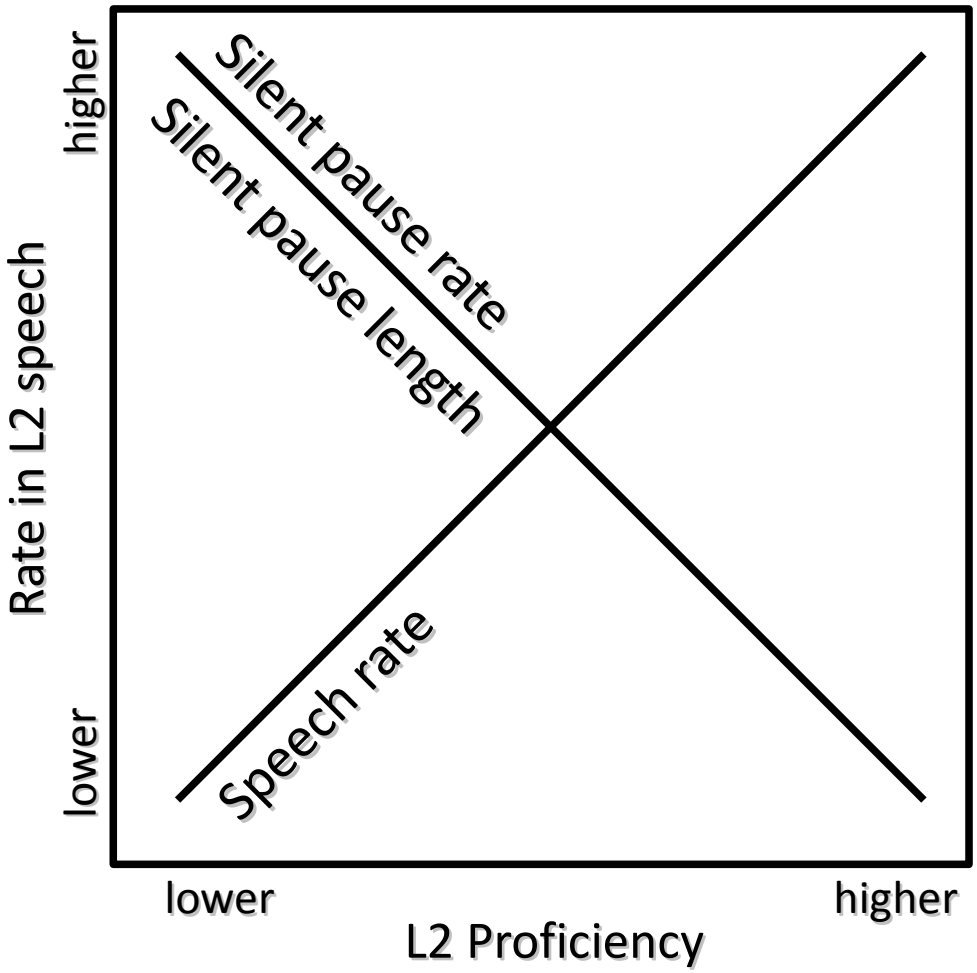
Observations of utterance fluency: Temporal variables



(Goldman-Eisler 1961, Levelt 1983, 1989, Maclay and Osgood 1959, Rochester 1973, inter alia)

(Cucchiarini et al 2010)

Temporal variables in L2 production



(Cucchiarini et al 2010, Kormos and Dénes 2004, Riazantseva 2001, Tavakoli 2011, Trofimovich and Baker 2006, 2007, Wu 2008)

Temporal variables in L2 production

- As a whole, work has been quite comprehensive.
- Lack of L1-L2 data from same speaker (cf., Cutler plenary)
- Gradually, more studies are including L1 observations.
  - Derwing et al (2009) and Cox and Baker-Smemoe (2012) observed that both speech rate and pause rate in L1 and L2 production are correlated.
  - De Jong et al (2015) found measures of L2 articulation rate were more meaningful when "corrected" for L1 speech patterns.
- Aim of the present research: Examine which utterance fluency characteristics correlate with perceptions of fluency by hearers.

Crosslinguistic Corpus of Hesitation Phenomena (CCHP)

- Participants: L2 learners of varying proficiency levels
- Elicitation tasks
  - Spontaneous speech: picture description, topic narrative
  - Reading aloud
  - Performed in both L1 and L2
- Annotation
  - Transcripts, HP, word and pause intervals
  - Two annotators, one checker

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<UTTERANCE>
 <T>in</T>
 <T>America</T>
 <T FILLED-PAUSE="yes">uh</T>
 <T>there's</T>
 <T>a</T>
 <T FILLED-PAUSE="yes">uh</T>
 <T>very</T>
 <T>famous</T>
 <T FILLED-PAUSE="yes">uh</T>
 <T>and</T>
 <T>loved</T>
 <T FILLED-PAUSE="yes">uh</T>
 <T>basketball</T>
 <RP>
  <O>
   <T>cl#</T>
  </O>
  <T FILLED-PAUSE="yes">uh</T>
  <E>
   <T>association</T>
  </E>
 </RP>
 <T>which</T>
 <T>is</T>
 <T>called</T>
 <T>NBA</T>
 <T>National</T>
 <T>Basketball</T>
 <T>Association</T>
 <T>I</T>
 <T>think</T>
</UTTERANCE>
```

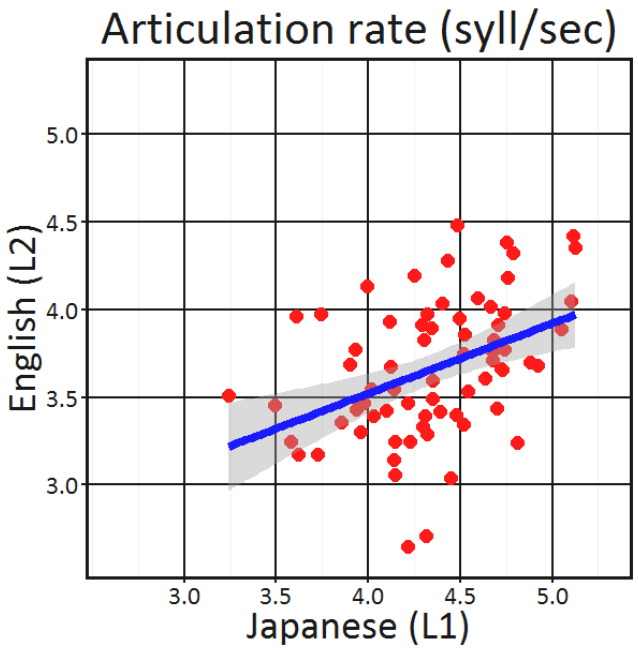
CCHP: Basic Statistics

- Participants: 36 Japanese L1 / English L2 speakers
- L1-L2 utterance fluency factors measured with Praat script (Quené et al 2011)

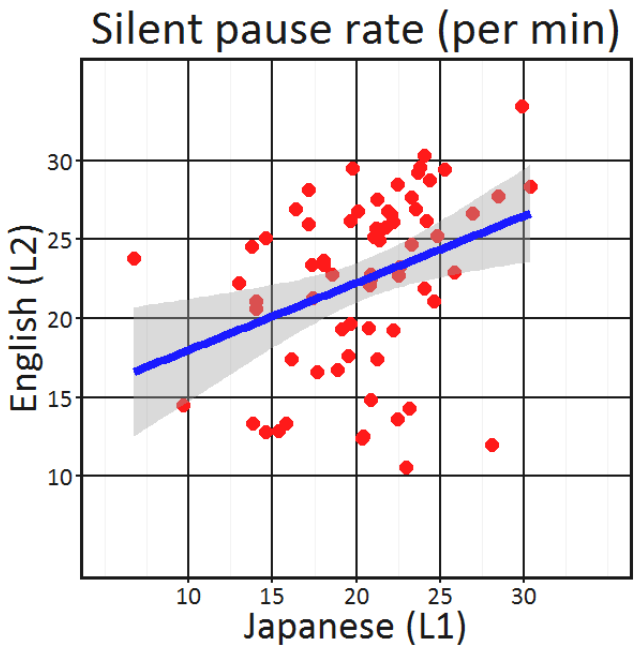
	Word count	Time
Read speech	22,336	2 hr, 48 min
Spontaneous speech	40,296	8 hr, 43 min
Total	62,632	11 hr, 31 min

Transcriber agreement = 91.5%

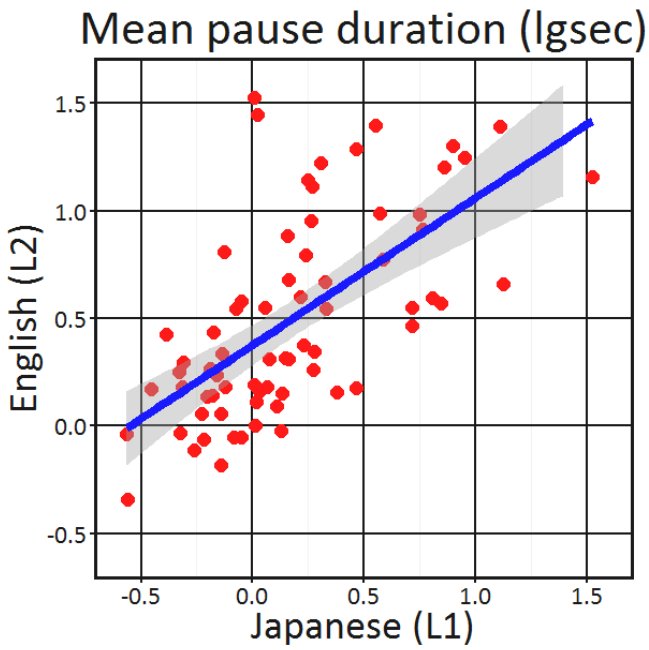
L1-L2 Utterance Fluency



r=0.413
p<0.001
r^2=0.17



r=0.341
p<0.005
r^2=0.12



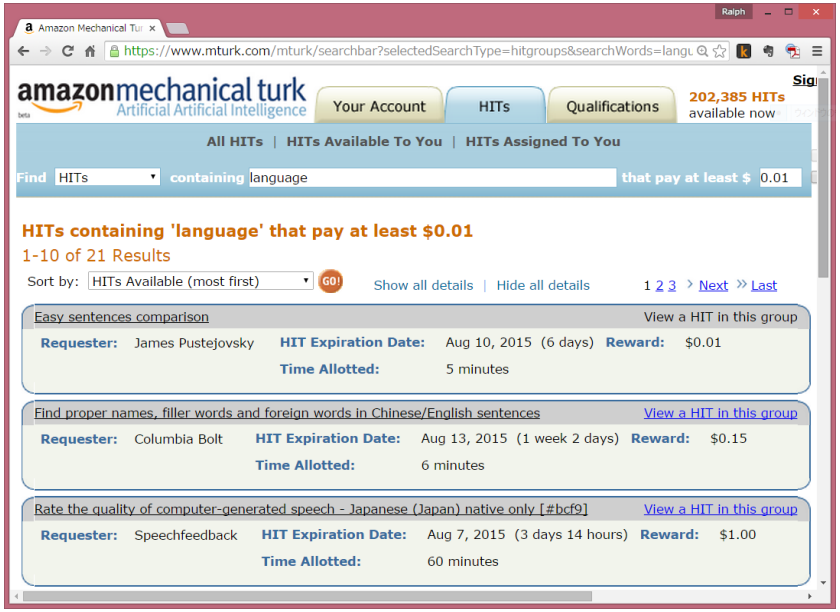
r=0.636
p<0.001
r^2=0.40

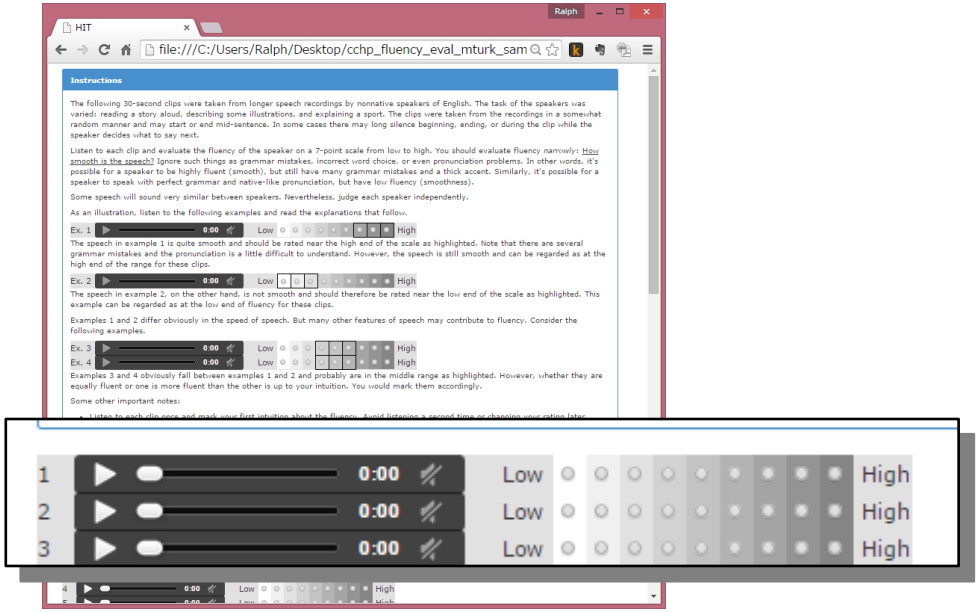
Pause duration > Articulation rate > Pause rate

Predictive of L2 proficiency

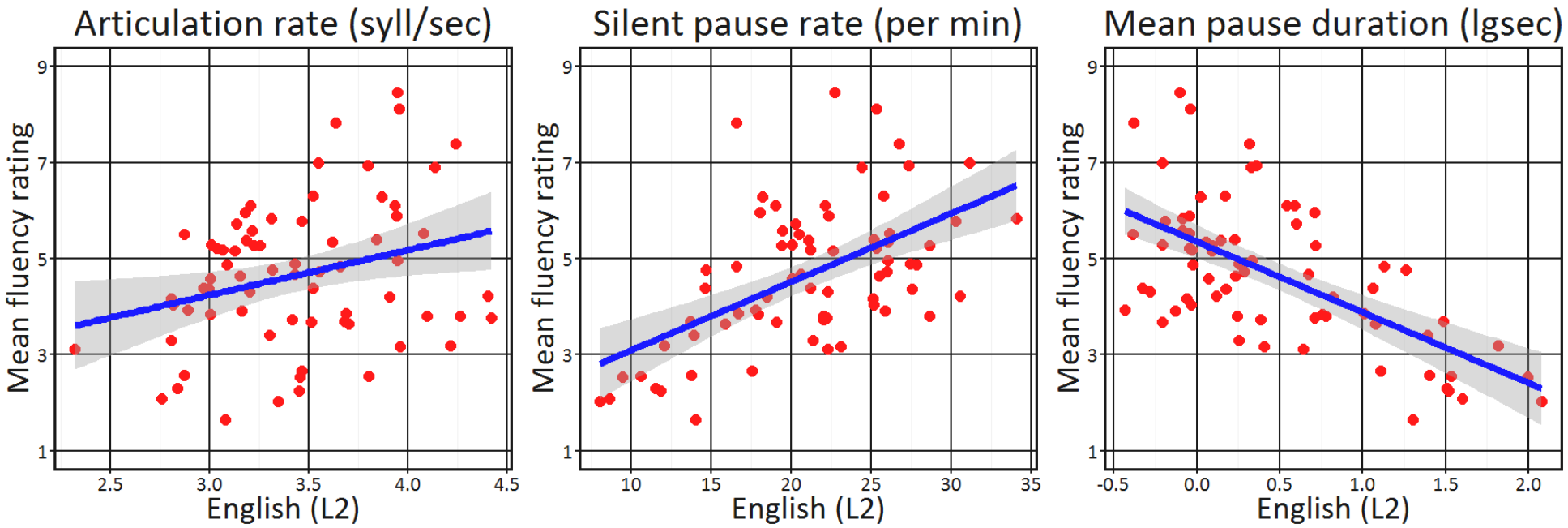
L2 Perceptual Fluency

- Fluency ratings (1=low … 9=high) obtained via Amazon Mechanical Turk
- Obtained fluency ratings on 7 30-second clips of L2 speech from all corpus participants.
- Used attention checks and background monitoring of audio player activity to check that instructions were followed.





Utterance Fluency vs. Perceptual Fluency



	Est.	Std. Error	t	p
(Intercept)	2.1831	1.0524	2.074	<0.05
Articulation rate	1.0268	0.2997	3.426	=0.001
Mean pause duration	-0.6138	0.0861	-7.130	<0.001
Adjusted R^2 = 0.4638; F(2,67) = 30.84, p<0.001				

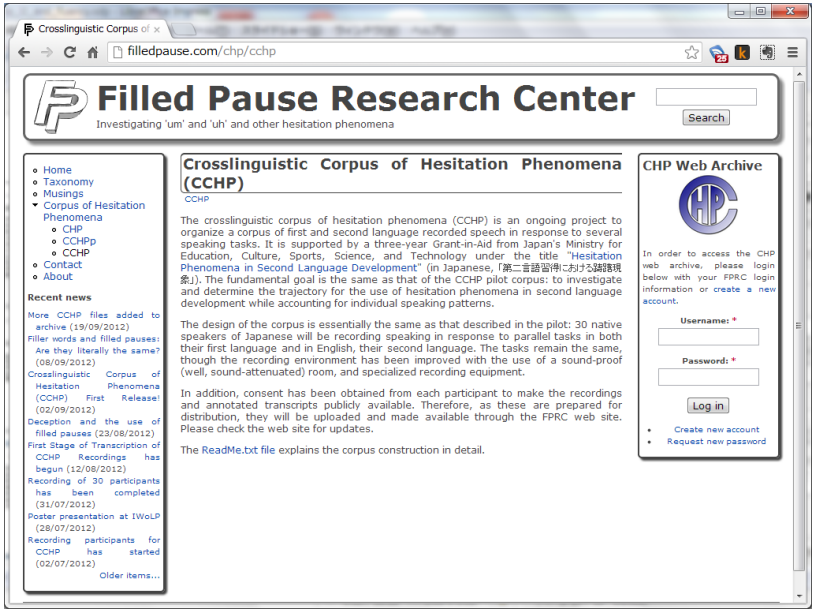
Summary and Implications

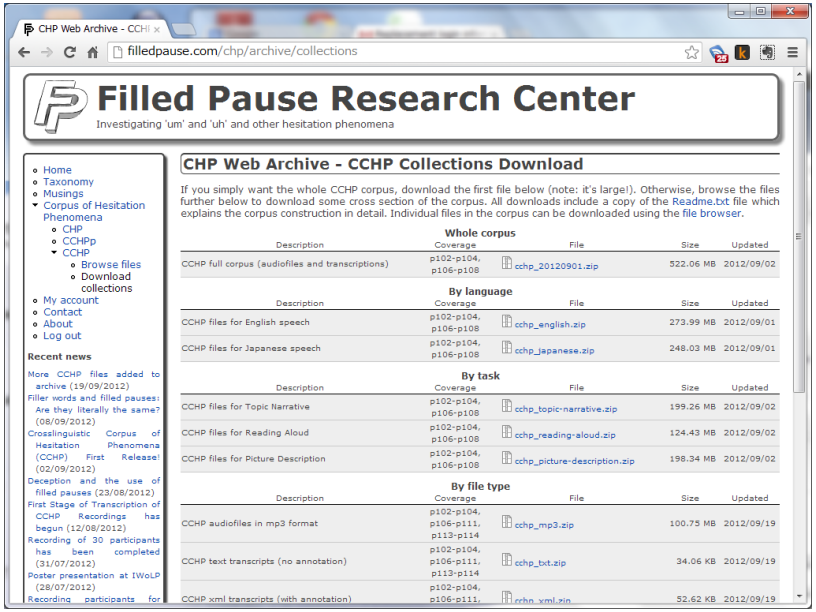
- Results show that for utterance fluency, silent pause rate is most indicative of learners' L2 proficiency.
  - Other L2 temporal variables correlate with those of L1.
- Fluency raters, however, seem to rely on articulation rate and silent pause duration instead.
- Implications for pedagogy
  - Raise awareness among L2 fluency raters of which temporal variables are truly indicative of L2 proficiency development.
  - Train speakers to speak faster and use shorter pauses.

Silent pause duration	Articulation rate	Silent pause rate
Strongest influence on perception of fluency		Best predictor of L2 Proficiency

CCHP Public Corpus

- Assembling a 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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