

Changes in intelligibility of English in a multilingual community

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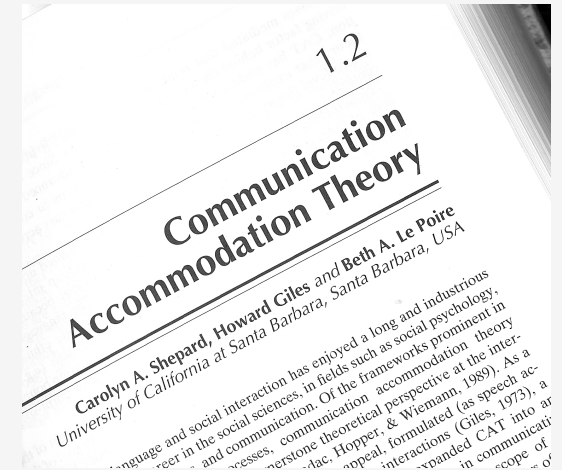
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U t r e c h t

U n i v e r s i t y

accommodation

- participants in conversation **converge** (accommodate)
 - phonologically, phonetically, stylistically
 - to increase “entrainment” and decrease social distance
 - e.g. “map task” conversation (Pardo, 2006)
- also without social context
 - word shadowing task (Goldinger, 1998)
- subconscious and automatic (Trudgill, 2008)



accent change

- also phonetic convergence of “accents” (varieties) (e.g. Evans & Iverson, 2007)
- similarly in new Dutch polders (Kamphuis, 1992)
- and requiring only brief exposure (Delvaux & Soquet, 2007)



perceptual effects

- shifts or changes in production
- also similar changes in perception?
- intelligibility of post-accommodated speech predicted to be higher than that of pre-accommodated speech
- within same talker

University College Utrecht

- bachelor college in Anglosaxon fashion
 - 3 year undergrad program
 - academic *Bildung*
 - ca 3x220 students + 60 exch
- selective, competitive, intensive
- English used as lingua franca
- also intensive social life



UCU English Accent

- multilingual, students' L1s are 10% English, 60% Dutch, 30% others
- *English-only policy*
- no pronunciation training
- minimal environmental effects
- unique (distinct) blend of L1/L2 English

German
Indonesian
Hungarian
Mandarin Ch
Spanish
Hebrew
Swedish
Polish
Lithuanian



L UCEA: Longitudinal Corpus of UCU English Accents

- 4 cohorts:
2010 ($n=72$), 2011 ($n=78$),
2012 ($n=72$), 2013 ($n=55$)
- 5 interviews (rounds) over 3 year
- total ~850 recordings, each ~20m
- metadata
from questionnaires and audiometry

LUCEA

- EN read texts

Rainbow Passage (Fairbanks, 1960),
Wolf Story (Deterding, 2006),
prosody sentences (White & Mattys, 2007),
intelligibility test sentences (Van Wijngaarden ea, 2002),
UN Decl Human Rights (UN, 1948; Bradlow ea, 2011)

- L1 read texts

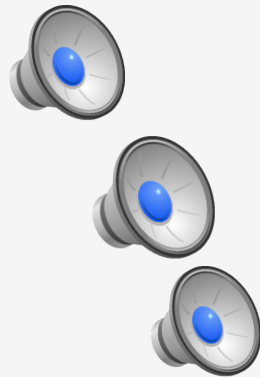
UN Decl Human Rights

- EN/L1 unscripted monologues
- EN unscripted dialogue

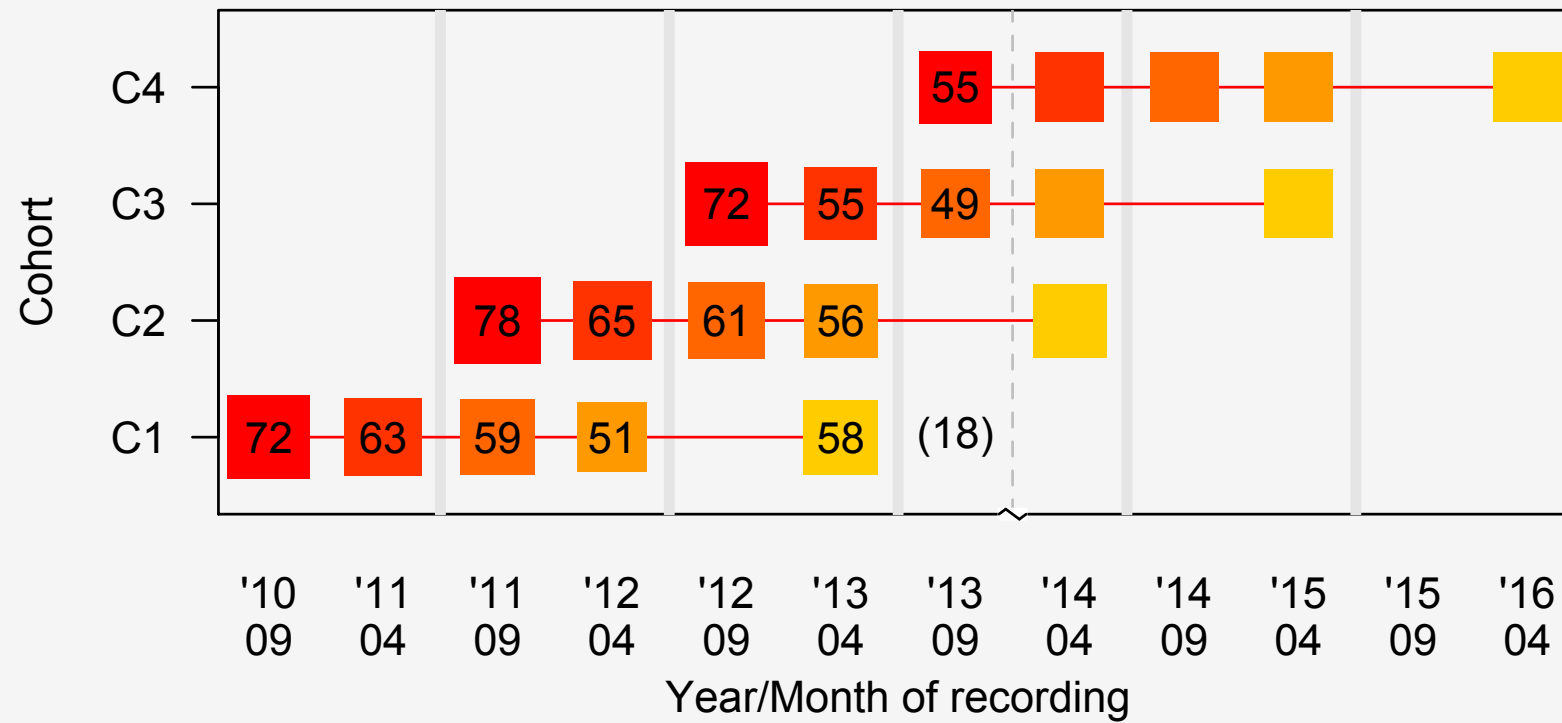
ARTICLE 4 No one shall be held in slavery or servitude; slavery and the slave trade shall be prohibited in all their forms.	ARTICLE 4 Nul ne sera tenu en esclavage ni en servi- tude; l'esclavage et la traite des esclaves sont interdits sous toutes leurs formes.
ARTICLE 5 No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.	ARTICLE 5 Nul ne sera soumis à la torture, ni à des peines ou traitements cruels, inhumains ou dégradants.
ARTICLE 6 Everyone has the right to recognition every- where as a person before the law.	ARTICLE 6 Chacun a le droit à la reconnaissance en tous lieux de sa personnalité juridique.

voorbeelden

- S109
- S060
- S121



Numbers of talkers in LUCEA corpus



Speech Reception Threshold

- **measure of intelligibility**
expressed as **Sp/Noi Ratio (SNR)** in dB
- list of 13 sentences, presented in noise
- response correct? next SNR -2 dB
response incorrect? next SNR +2 dB
- average SNR over last 10 sentences of list
- inefficient
 - entire list yields single SRT



factors

- **Round** (R1, R2, R3)
 - R1: Year 1, Month 1 (Sept 2010)
 - R2: Year 1, Month 8 (Apr 2011)
 - R3: Year 2, Month 1 (Sept 2011)
- **Talker's L1** (9 Eng, 15 Dutch, 6 Ger)
- **Listener's L1** (5 Eng, 33 Dutch, 7 E+D)

listeners

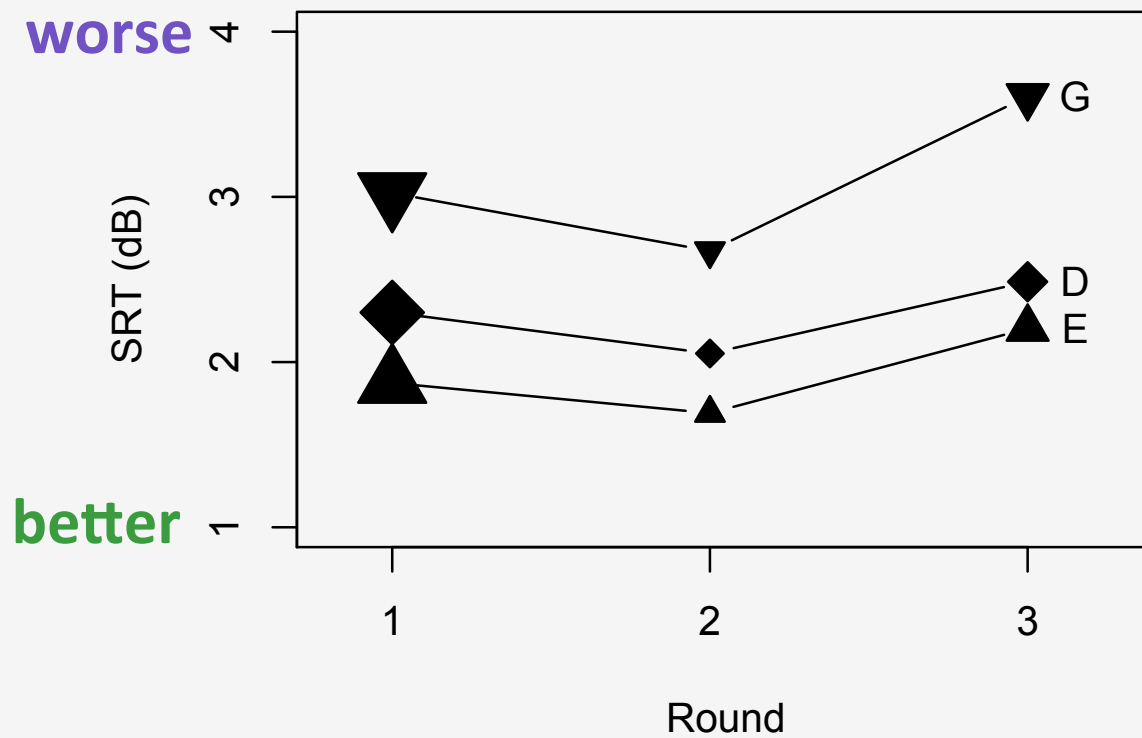
- L1 Dutch (n=33)
 - all very proficient in English
 - 18 inside UCU, 15 outside UCU
 - no differences, will be pooled in results
- L1 English (n=5)
 - all inside UCU
- biling/mixed English+Dutch (n=7)
 - all inside UCU

counterbalancing

- some lists of sentences were held back from talkers
- some talkers also participated as listeners
- listeners never heard a list which they themselves had spoken
- listeners never heard their own voice
- Lists, TalkerL1, and Round counterbalanced over listeners

results

listeners pooled



LMM: fixed factors

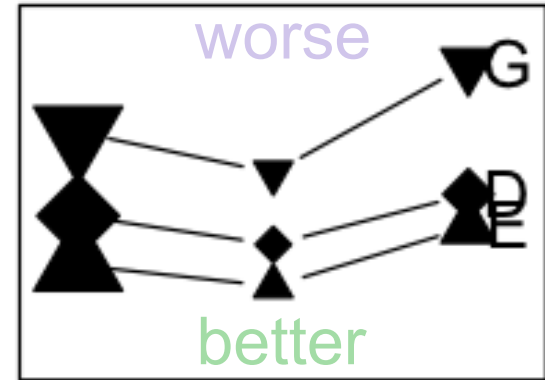
- Round (R1, R2, R3)
- Talker's L1 (9 E, 15 D, 6 G)
unequal numbers
- Listener's L1 (33 D, 5 E, 7 D+E)
unequal numbers

LMM: random

- 3 random effects (crossed):
Talker (30), Listener (45), List (6)
- random intercepts
- **random slopes** of Round
at levels of talker and of listener
 - effects of (speaker's) Round allowed to vary
across talkers and across listeners
 - heterogeneous variances allowed

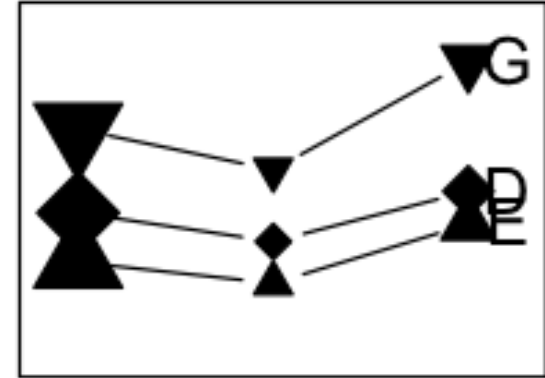
LMM: fixed

- **R2: $\beta = -0.5$ ($p = .045$)**
i.e. intell **better** than at R1
- **R3: $\beta = +0.2$ (n.s.)**
i.e. intell same as at R1
- **German talkers: $\beta = +0.7$ ($p = .044$)**
i.e. intell **worse** than of Du or Eng talkers
- listener groups: no effects
- talker \times listener: no interaction effect ($F < 1$)



LMM: random

- variances between talkers:
 $s^2 = 1.182, 0.317, 0.640$
- variances between listeners:
 $s^2 = 0.110, 0.003, 0.006$
- **variance** in intelligibility is lowest for stimuli from R2 recordings
- random slopes of Round increase fit of LMM
[Likelihood Ratio Test, $\chi^2(5)=17.3, p=.0040$]



convergence

- same talkers are more intelligible after phonetic convergence (R2) than before (R1)
 - lower average SRT
 - less variance in SRT
(between talkers and between listeners)
 - phonetic convergence not attested here
- summer break (between R2 and R3)
annihilates effect of previous convergence

interlanguage benefit

- no benefit observed (no interaction)
 - contra Bent & Bradlow (2003) and many others
- L1 listeners used to L2 accent
 - exposed to Dutch-accented English on and off campus
- L2 talkers already very proficient

(Hays-Harb et al, 2008; Van den Doel & Quené, 2013)

conclusions

- accommodation within community does increase talkers' intelligibility within that community
- makes conversations more efficient
- accents remain plastic, after long period of accommodation (9m)

THANK YOU