Patterns of short-term phonetic interlingual interference in bilingual productions

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Introduction

Immediate phonetic interference in code-switching and interpreting (Šimáčková & Podlipský, ICPhS 2015).

Language mode (Grosjean 1985, 1997) – "the state of activation of the bilingual's languages and language processing mechanisms at a certain point in time" (2001:2)

- monolingual (L2-only)
- bilingual (code-switching, translating)

Introduction

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Short-term interference (Paradis 1993, Grosjean 2011, Simonet 2014) – a temporary increase in the degree of cross-language interference due to activation of both bilingual's languages

Phonetic reflexes of code-switching

over the last decade attracting steady interest

Bullock et al. 2006
Bullock & Toribio 2009
Antoniou et al. 2011
Gonzalez López 2012
Simonet 2014
Balukas & Koops 2014
Piccinini & Arvaniti 2015
Olson 2016

X

Grosjean & Miller 1994

"(CS) usually involves a total change, not only at the lexical but also at the phonetic level" (205)

CS-induced phonetic effects

Diverse outcomes but some points emerge:

- Cross-language convergence as well as divergence
- Directionality of effects ($L_A \rightarrow L_B$ and/or $L_A \leftarrow L_B$)
  - language acquisition order and use, language dominance and proficiency
  - bidirectional (early bilinguals in *Bullock&Toribio 2009*, highly proficient late bilinguals in *Olson 2016*)
  - unidirectional (*Bullock et al. 2006*, *Antoniou at al 2011*, *Balukas & Koops 2014)*
- Position of effects relative to the switch site
  - anticipatory (speech planning)
  - carry-over (transient nature; speech planning or articulation?)
- Nature of the phonetic categories in L_A and L_B
  - Voice Onset Time (VOT) of short-lag vs. long-lag voiceless stops

VOT of Czech and English stops

L1 → L2

L1 Czech – short-lag [p, t, k]

L2 English – long lag [p^h, t^h, k^h]

Czech-English bilinguals in our studies

- foreign language learners
- L1-dominant
- highly proficient in L2 (C1 or C2 in CEFR)
- undergraduate students of interpreting
- metalinguistic awareness (phonetics course)
- n 18 and 14, age 19 - 27

Predictions for Study 1

1. Switching languages induces an immediate increase in L1 interference.
   - VOTs in Czech-to-English code-switched utterances will be shorter than VOTs in the English-only mode
2. Interpreting induces greater interference than code-switching.
3. Speakers experienced with switching languages show less short-term interference.
   - 9 experienced vs. 9 beginner interpreters

Method

VOT of voiceless stops under 3 conditions

- English-only (*EN*), code-switching (*CS*), interpreting (*IN*)

Targets: 12 English words (1 syll): 6 *p*- & 6 *t*- initial

- EN / CS stimuli – 12 targets placed in 2 sentence positions: initially & finally = 24 English sentences
  - recorded by 5 English speakers (3 AmE, 2 BrE)
- IN stimuli – Czech equivalents of 12 targets, initial or final in a sentence = 24 Czech sentences
  - recorded by 5 Czech speakers
- Prompts: EN *What should you say?* / CS 'Co jsi slyšel?' *What did you hear?* / IN 'Co teď řekneš?' *What will you say now?*

Tasks

Delayed repetition and translation

Delayed repetition

ENGLISH-ONLY condition

Voice 1 *Pubs won't be open yet.*

Voice 2 *What should you say now?*

Response *"I should say Pubs won't be open yet".*

Delayed repetition

CODE-SWITCHING condition

- Voice 1 *Pubs won't be open yet.*
- Voice 2 *Co jsi slyšel?*
- Response *"Slyšel jsem Pubs won't be open yet".*

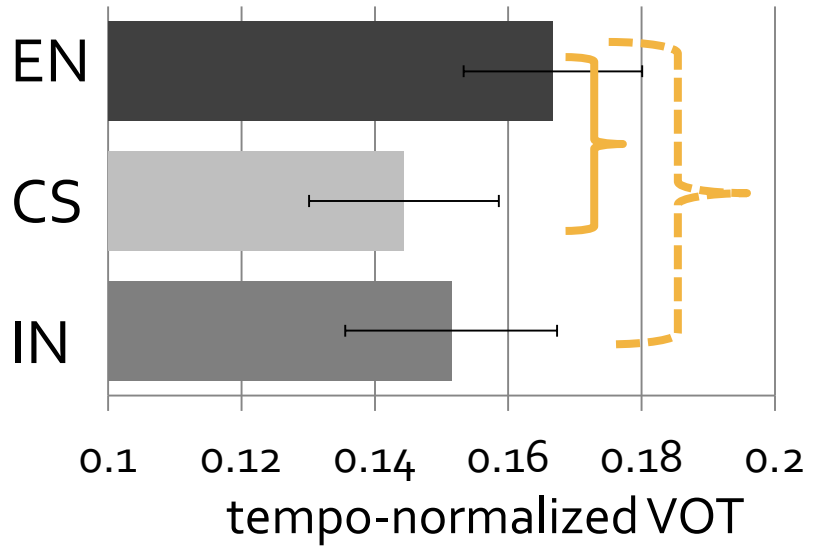
Translation

INTERPRETING condition

👂 Voice 1	*Hospody jsou dnes večer zavřené.*
👂 Voice 2	*Co teď řekneš?*
👄 Response	*"Teď řeknu Pubs are closed tonight".*

Results

- tempo-normalized VOT – % of word duration
- a posteriori Speaker groups
  - LongLag (n=9) , ShortLag (n=9)
- RM Anova (2 S-group, ~~2 Experience~~, 2 Place, 3 Condition)
  - effect of *Condition*
    $F(2, 28)=5.78$, $p<.01$
  - post-hoc Tukey
    - CS vs. IN, n. s.
    - EN vs. CS, $p < .05$
    - EN vs. IN, $p = .06$



Discussion

A quick recap

- 3 conditions
  - i. L2 English → the monolingual mode
  - ii. Code-switching
  - iii. Interpreting

  } the bilingual mode

Conclusions of Study 1

✓ 1. Short-term L1-to-L2 interference
   - VOTs of /p, t/ in the bilingual tasks were more L1-like compared to the monolingual L2-only task.

✗ 2. Short-term interference during interpreting and code-switching
   - no difference in VOT between the two bilingual tasks

✗ 3. Short-term interference modulated by experience with switching languages
   - no difference in short-term interference between experienced interpreters and beginners

Goals for Study 2

1. Can we replicate the finding of short-term interference during the **CS condition** found in Study 1?

2. Can we replicate the finding of interference during the **interpreting condition** even when the interpreting task does NOT also involve a code-switch?
   - Hypothesis: Yes
     Anticipatory cross-language influence has been attested, thus short-term interference in L_A does not occur only due to the recent articulation of L_B sounds but can be caused by planning speech in L_B (phonological encoding level).

Study 2: Method

Conditions:

1. English-only, 2. Code-switching = *Study 1*

3. Interpreting:

👂 Voice 1 *Hospody jsou dnes večer zavřené.*

👂 Voice 2 ***~~Co teď řekneš~~? What should you say now?***

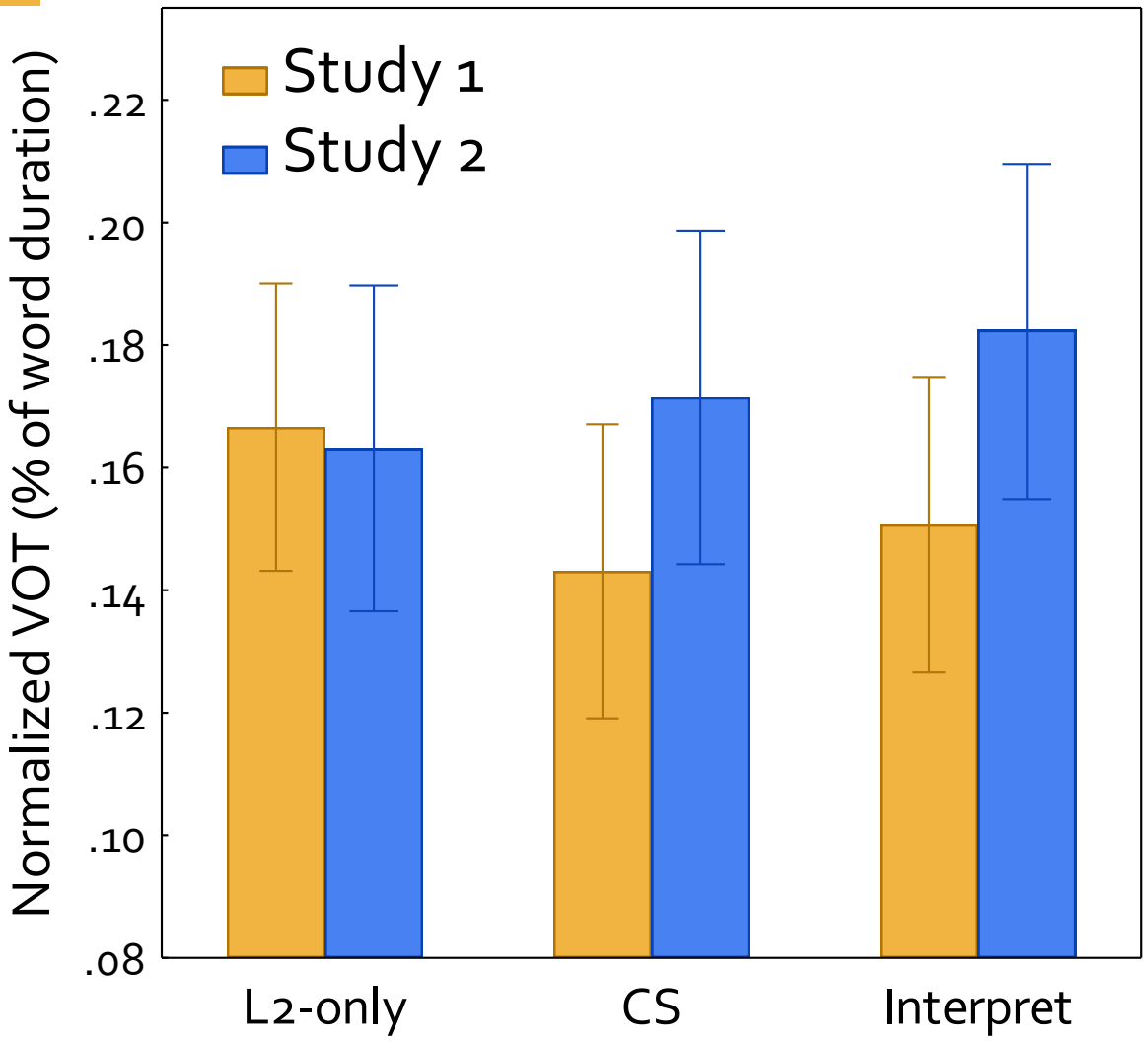
👄 Response ***~~"Teď řeknu~~ I should say*** *Pubs are closed tonight".*

Results

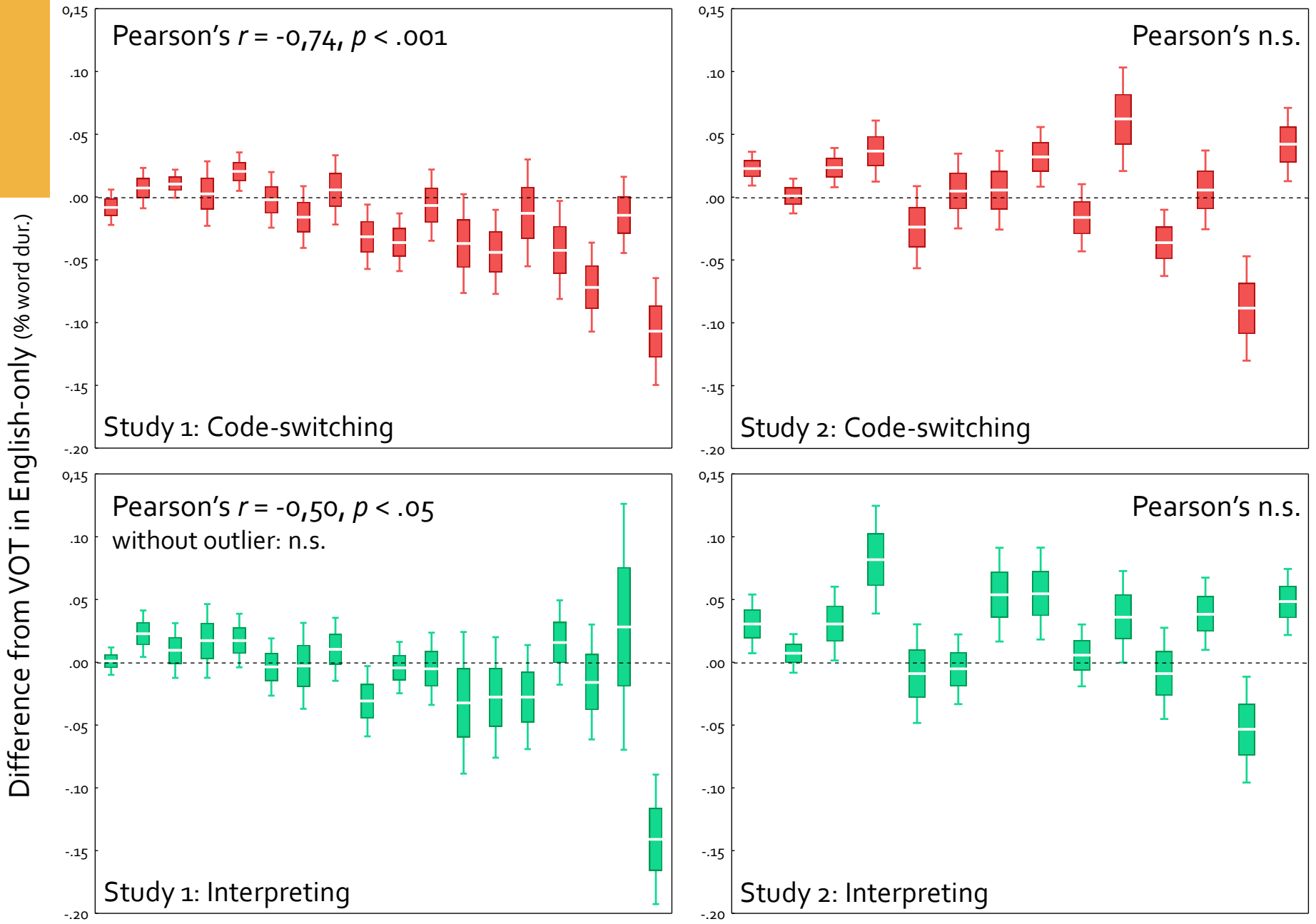
- tempo-normalized VOT – % of word duration
- RM Anova (2 Study, 2 Place, 3 Condition)

effects	*F* (1, 30)	*p*
Place	60.37	.000*
Study	**1.30**	**.263**
Condition	**1.61**	**.208**
interactions	*F* (2, 60)	*p*
Condition * Study	**6.27**	**.003***
Place * Study	0.08	.776
Condition * Place	4.91	.011*
Condition * Place * Study	1.38	.259

Condition * Study



- L2-only: VOTs comparable
- Interpreting: longer VOTs in Study 2 than Study 1
- However, such difference even in CS
  - Study 2: VOTs in bilingual tasks tend to be longer than in L2-only


Pearson's r = -0,74, p < .001
Study 1: Code-switching
Pearson's n.s.
Study 2: Code-switching
Pearson's r = -0,50, p < .05
without outlier: n.s.
Study 1: Interpreting
Pearson's n.s.
Study 2: Interpreting
0,15
.10
.05
.00
-.05
-.10
-.15
-.20
Difference from VOT in English-only (% word dur.)
Speakers from lowest to highest mean normalized VOT in English-only condition

Discussion

- RQ1: Study 2 did not replicate the finding of short-term interference in Study 1.
  - Study 1: VOT in L2 English became *more* L1-like in the bilingual mode
    - interference
  - Study 2: VOT in L2 English tended to be *less* L1-like
    - hyper-correction resulting in enhancement of an L2 phonetic category?

Discussion

- RQ2: Does carry-over interference from the other language take place at the level of speech planning or due to its recent articulation?
  - Can we find short-term interference during the interpreting condition even when the interpreting task does not also involve articulation in L1?
- Study 2 – no difference between the monolingual task and either interpreting or code-switching
  - RQ2 cannot be answered

Why did S1 not replicate S2?

- The difference between S1 & S2 in the bilingual tasks observed because
  - participants were not matched for baseline VOT.
  - collected data was not representative of individual speakers

Why did S1 not replicate S2?

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  - participants were not matched for baseline VOT.
  - collected data was not representative of individual speakers
- Individual differences
  a) short-term L1 interference in L2 (Antoniou et al. 2011)
  b) enhancement of L2 phonetic categories (hyper-correction) (Bullock & Toribio 2009)
  c) both (a) and (b)
  d) no temporary change in cross-language influence
- Unknown factor at play

Conclusion: phonetic consequences of CS

- Prior research has produced diverse results
  - but different types of bilinguals, language combinations, methodologies
- Our findings: results diverse even with participants from the same homogeneous population
- Phonetic effects of CS
  - unlike basic mechanisms of L1-L2 interaction that invariably yield effects in the same direction
  - subject to multiple external and internal factors giving rise to individual variation

Thank you!

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