Cross-Language Semantic Interference Effects During Picture Naming in Bimodal Bilinguals

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INTRODUCTION

- Like spoken language bilinguals, bimodal bilinguals activate words from both languages when comprehending and producing in one language (Shook & Marian, 2012; Giezen & Emmorey, in press)
- Current models disagree about whether the competition between words in a bilingual's lexicon occurs at the lexical or articulatory level (Hall, 2011; Mahon et al., 2007)
- Because sign and speech are produced with different articulators, bimodal bilinguals present an unique opportunity to distinguish between these two accounts

RESEARCH QUESTION

Does competition between words in two languages occur at the lexical level or at the articulatory level?

HYPOTHESES

Bimodal bilinguals

- If competition occurs at the **lexical level**, then bimodal bilinguals should exhibit semantic interference when naming pictures in the context of cross-language distracters
- If competition occurs at the **articulatory level**, then bimodal bilinguals should **NOT** exhibit semantic interference

Monolingual controls

- Monolinguals will show semantic interference when naming pictures in the context of within-language distracters

PARTICIPANTS

	ASL-English bilinguals (n=16, 10 F)	English monolinguals (n=17, 14 F)
Age (yrs)	32.0 (7.54)	24.6 (4.9)
# Years of education	17.8	15.0 (1.2)
Age of exposure to ASL	10.7 (7 CODA, 9 L2)	
% Time ASL exposure	34.6	
ASL production proficiency[1]	6.1	
ASL comprehension proficiency[1]	6.3	

[1] Self-rating on 1-7 scale, ranging from 'almost none' to 'like native'

Picture-Word Interference Task

Task

- Naming pictures in **American Sign Language** (bimodal bilinguals) or **English** (monolingual controls) with English auditory distracter words

Stimuli

- 25 target pictures paired with semantically-related and unrelated distracter words

EXAMPLE — **Picture** — **Distracter**

pants

Semantic: *shirt*
Unrelated: *falcon*

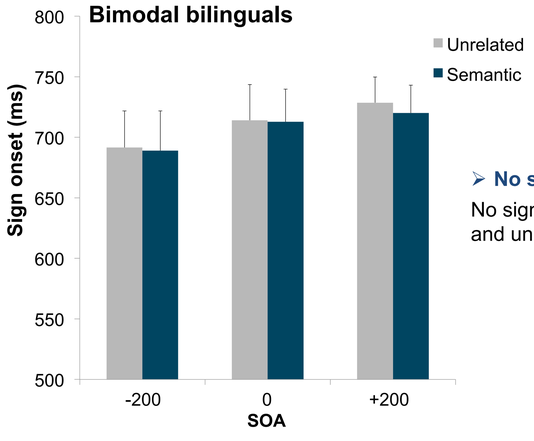
Design

- Distracter words were presented 200 ms before target picture onset (Stimulus Onset Asynchrony (SOA) = -200), simultaneously with picture onset (SOA = 0), or 200 ms after picture onset (SOA = +200)

Analysis

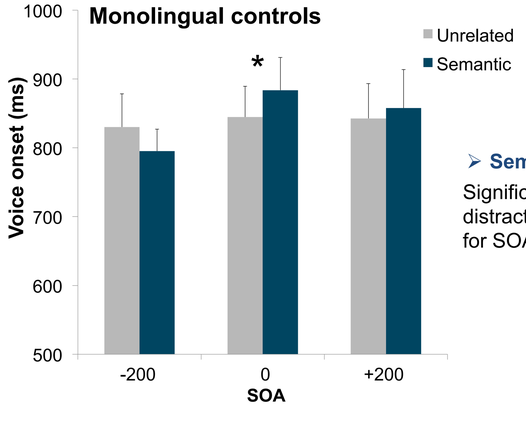
- Key release times (bimodal bilinguals) or voice onset times (monolingual controls) using Psyscope X60
- Planned comparisons between semantically-related and unrelated distracters for each SOA condition

RESULTS



➢ **No semantic interference**

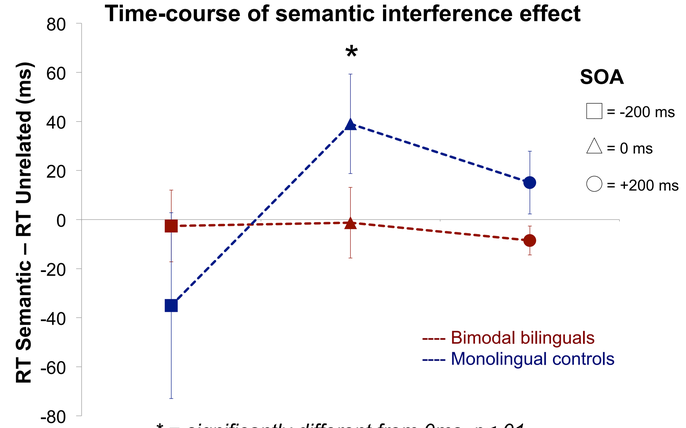
No significant differences between semantically-related and unrelated distracters for any SOA (all ps > .15)



➢ **Semantic interference at 0ms SOA**

Significantly slower responses with semantically-related distracters for SOA = 0ms ($p < .01$), but no differences for SOA = -200ms or SOA = +200ms (ps > .25)

Time-course of semantic interference effect



** = significantly different from 0ms, p<.01*

DISCUSSION

Bimodal bilinguals

- No semantic interference in any of the SOA conditions

➢ *Replicates previous findings of no interference at 0 ms SOA (Giezen & Emmorey, in press) and extends these results to earlier and later SOAs*

Monolingual controls

- Semantic interference in the SOA=0ms condition

➢ *In line with previous observations that semantic interference effects are most robust at 0ms SOA (Hall, 2011)*

CONCLUSIONS

- Bimodal bilinguals do not exhibit cross-language semantic interference effects in picture-naming
- This result implies that for spoken language bilinguals, competition between languages occurs at the articulatory level
- These findings support psycholinguistic models that propose a relatively late locus of lexical selection in production (Mahon et al., 2007)

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