Effects and non-effects of sign language knowledge on written word recognition:

A comparison of ASL-English and DGS-German bilingual adults

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## Overview

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What happens in bilingual processing, when we read (Dijkstra, 2005)
listen (Marian & Spivey, 2003)
speak (Kroll, Bobb, & Wodniecka, 2006)

Bilingual studies: Single lexicon with L1 & L2 forms competing for recognition

*co-activation is the norm, not the exception*
What about deaf bilinguals?

read

listen

speak
Cross-language activation in Spanish-English hearing bilinguals

Spanish: PERRO

Orthographic: PERRO
Phonological: /perro/
Semantic: PERRO

Activates:

English: PARROT

Orthographic: PARROT
Phonological: /pε:/ (PEAR)
Semantic: DOG
Research Questions

Do sign-print bilinguals experience co-activation?

If so, does co-activation lead to inhibition or facilitation of lexical access?
Experimental Procedure

1. Signed Language Proficiency Task
   - ASL-SRT / DGS-SRT

2. Written Language Proficiency Task
   - Woodcock-Johnson III Passage Comprehension,
   - Goethe Institute German Proficiency Test

3. Experimental Task

4. Vocabulary Translation Task
   - Deaf Participants translated English/German stimuli into ASL/DGS
   - If response was not the expected translation then RT data for that stimulus were eliminated
Sample Trial:
Are these words semantically related?
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Are these words semantically related?
Study Design: *Implicit* priming experiment in German/English print only

YES response: semantically related

NO response: semantically unrelated
Criteria for Stimuli Development

• Validity and Reliability of Stimuli
  – verified by native signers

• Semantic Relatedness Judgment Test
  – Native German/English speakers

• Word frequency, length & syllables
  – English: http://elexicon.wustl.edu
  – German: http://wortschatz.uni-leipzig.de
Hypotheses

Are signs activated during reading?  

- YES  
- NO

- Slower RT in implicit condition
- More errors in implicit condition
- Same RT for control & implicit
- Same accuracy for control & implicit
RT Analysis I

No effects in control group
RT Analysis II
Inhibition & Facilitation

- Semantically Unrelated
- Semantically Related

Data categories:
- DGS - Control
- DGS - Implicit
- ASL - Control
- ASL - Implicit

Significance levels:
- * p < 0.05
- ** p < 0.01
Error Analysis I
Hearing bilinguals show unexpected effect on English
Error Analysis II
ASL signers make more errors

Semantically Unrelated
Semantically Related
Conclusions

Print activates signs in sign-print bilinguals

Sign activation can inhibit or facilitate lexical access

Co-activation does not rely solely on cross-language form similarity i.e., cognates

Conclusions
Discussion I: Facilitation vs. Inhibition Effects

Facilitation

Sign families → repetition priming

morpheme priming

(Fernald & Napoli, 2000)

Inhibition

Competition increases when phonologically similar but morphologically distinct forms are simultaneously activated

MOTHER - FATHER
CONGRESS - SENATE

MOVIE - PAPER
YESTERDAY - DORMITORY
Discussion II  ASL - DGS differences

Cross-linguistic difference?

Widespread use of fingerspelling & initialization in ASL

Widespread use of Mundbilder in DGS

Population difference?

Education/Literacy level
In USA

Education/Literacy level
In Germany

Iconicity effects at the lexical level
(cf. Thompson et al., 2009a, 2009b)
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