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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

Research
question

Do printed words activate signs in deaf
bilinguals?

2 Studies

DGS-German & ASL-English bilinguals

Discussion

Is form overlap a pre-requisite of
co-activation?

How do form relationships mediate
co-activation?

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?

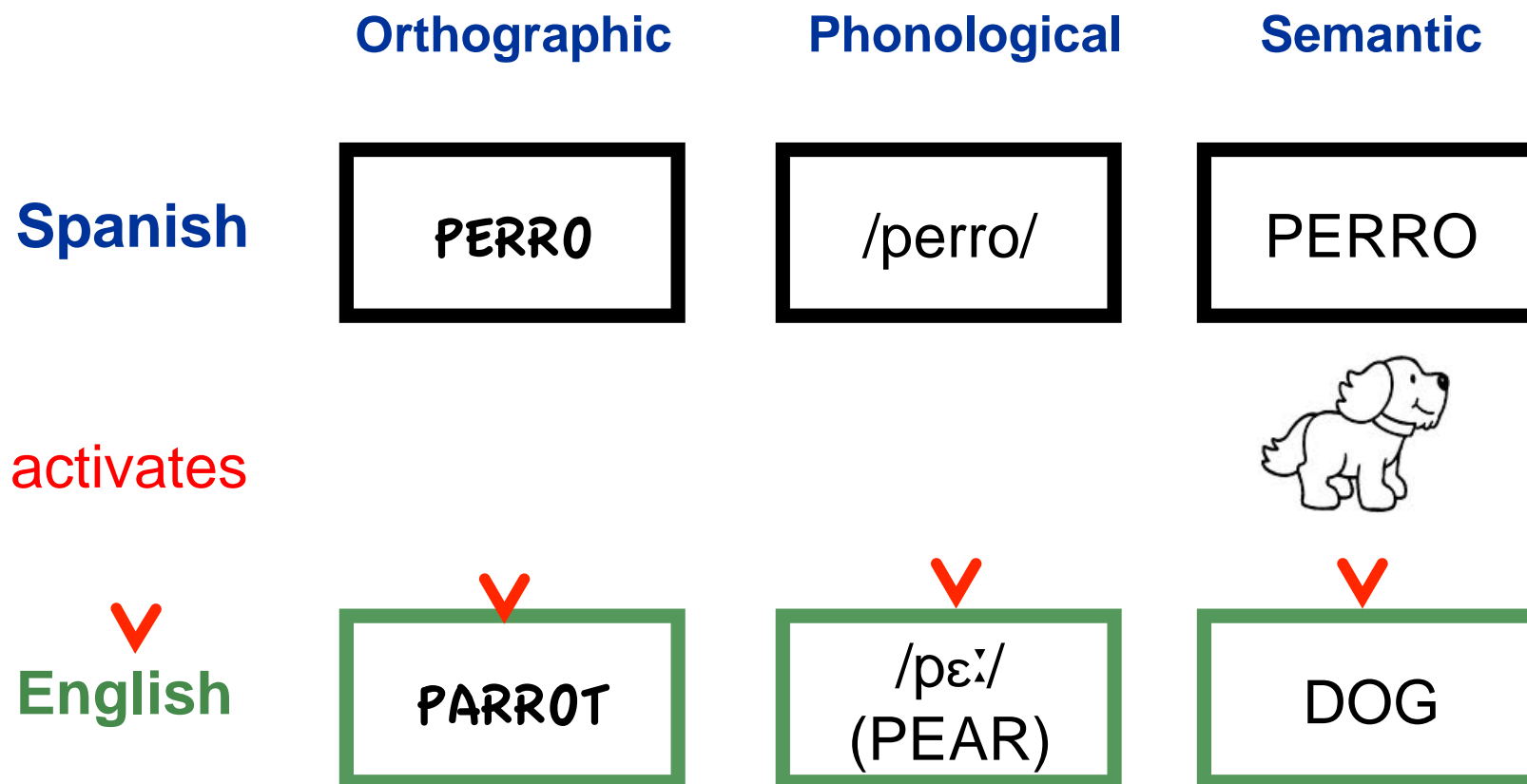
read



listen

speak

Cross-language activation in Spanish-English hearing bilinguals



Research Questions

Do sign-print bilinguals experience co-activation?



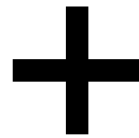
If so,

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

criteria for
▶ Participants



Sample Trial:

Are these words semantically related?

MOVIE

Sample Trial:

Are these words semantically related?

PAPER

Sample Trial:

Are these words semantically related?

Study Design:

Implicit priming experiment in German/English print only

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Phonologically
related in DGS

Phonologically
unrelated in DGS

YES response:
semantically related



Recht
(rights)

Jura
(law)

Gabel
(fork)

Löffel
(spoon)

NO response:
semantically unrelated



Gemüse
(vegetable)

Nummer
(number)

Käse
(cheese)

Haar
(hair)

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

▶ Slower RT
in implicit
condition

▶ More
errors in
implicit
condition

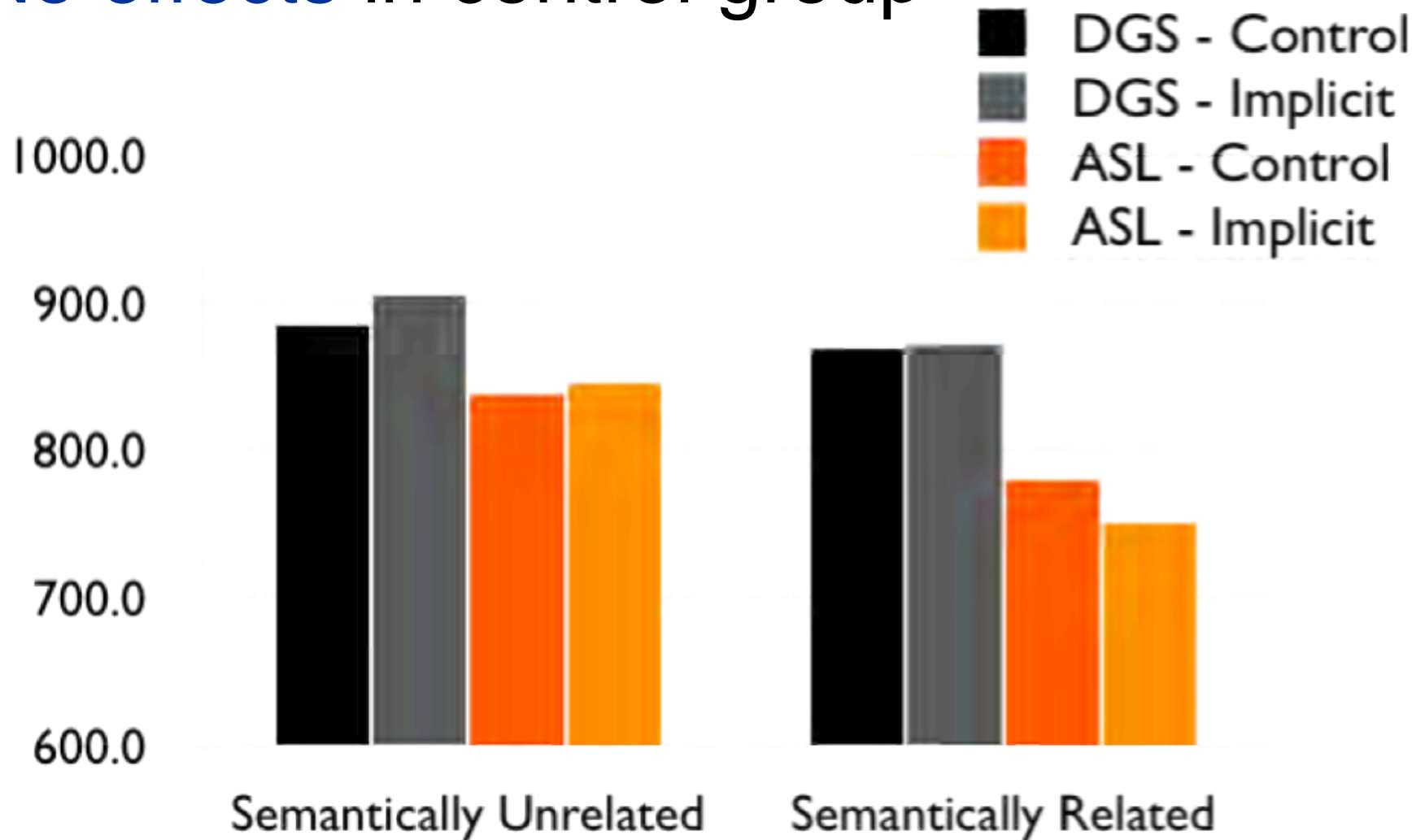
NO

◀ Same RT
for
control &
implicit

▶ Same
accuracy
for control
& implicit

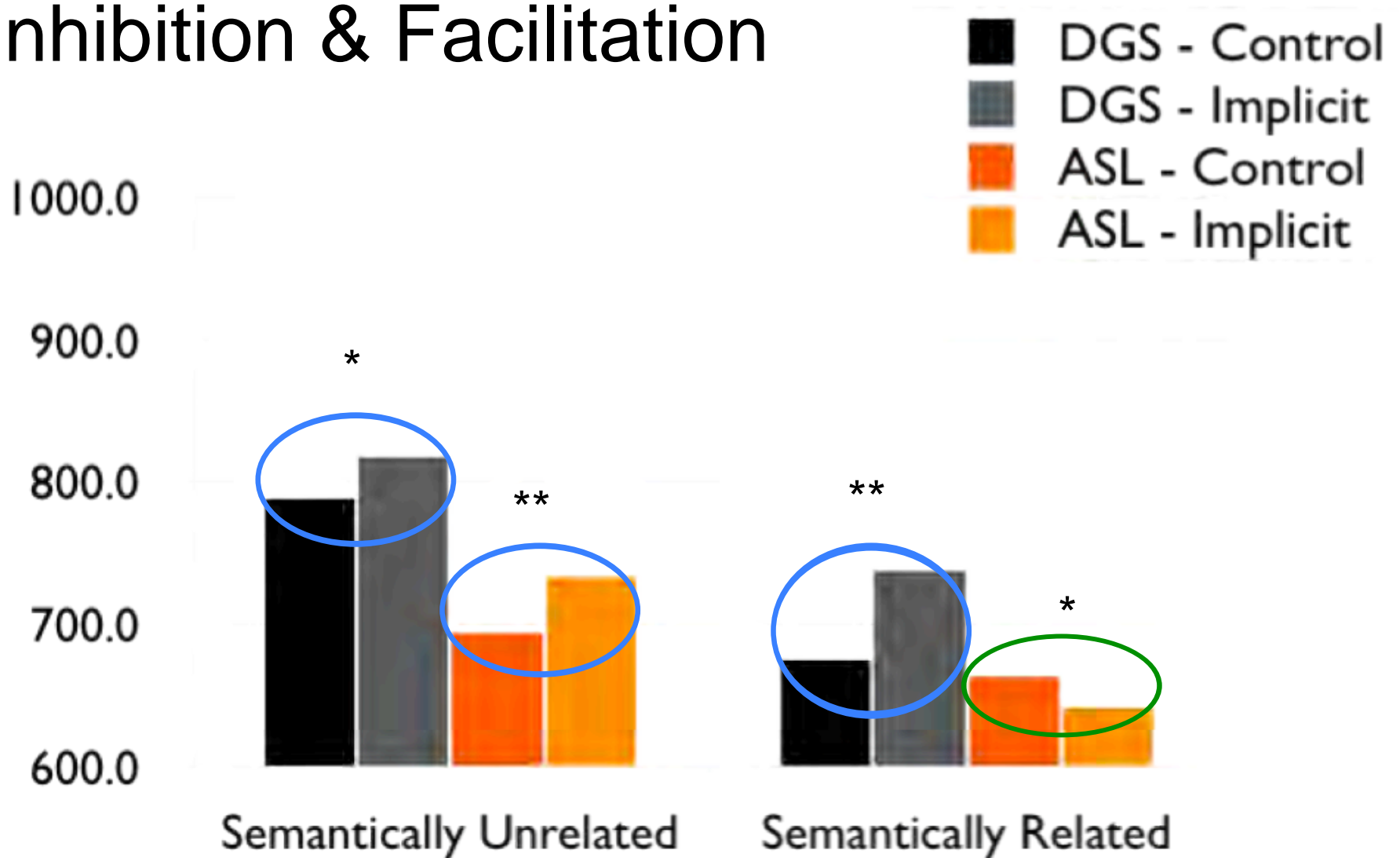
RT Analysis I

No effects in control group



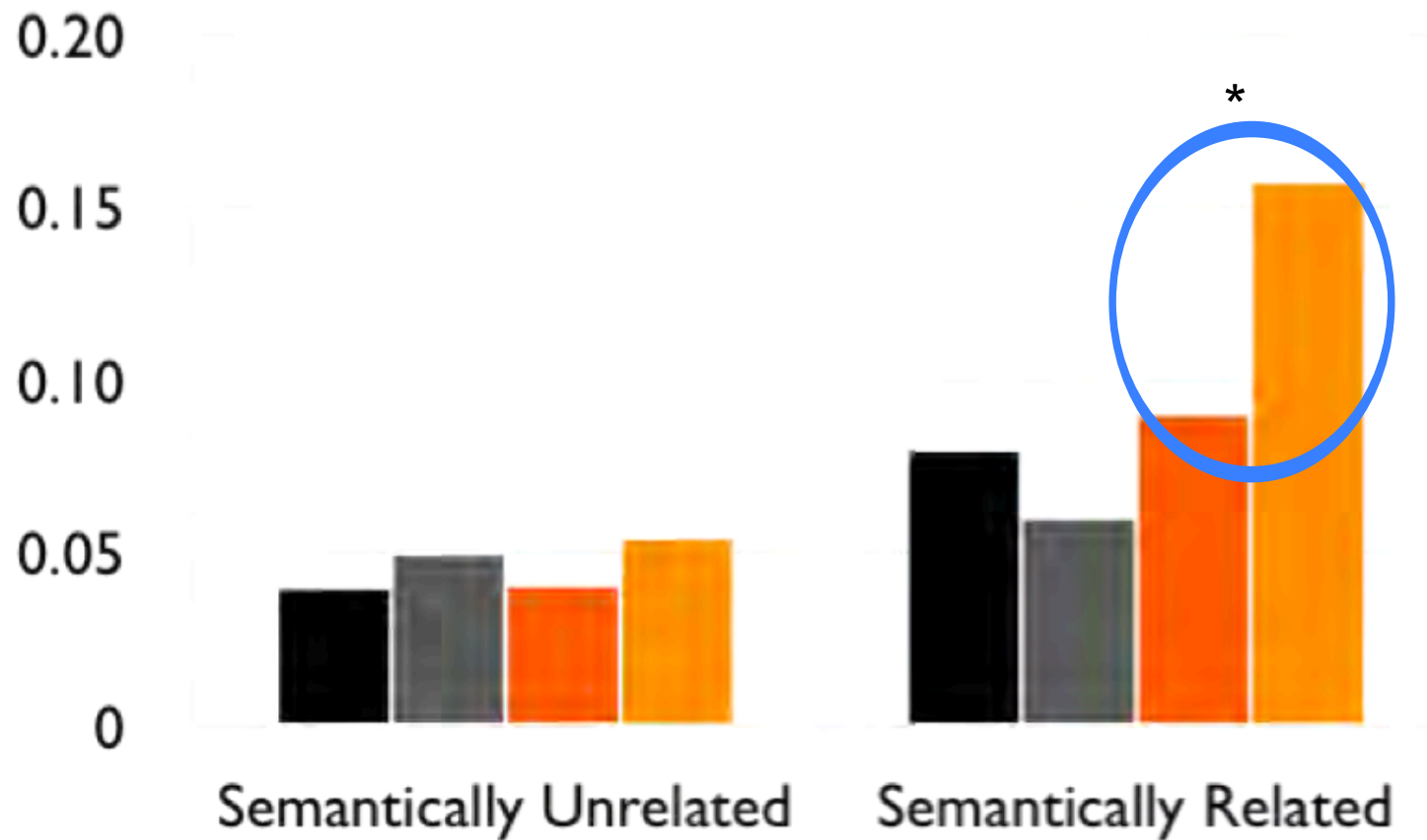
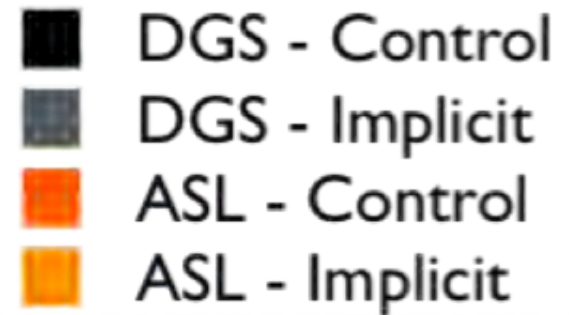
RT Analysis II

Inhibition & Facilitation



Error Analysis I

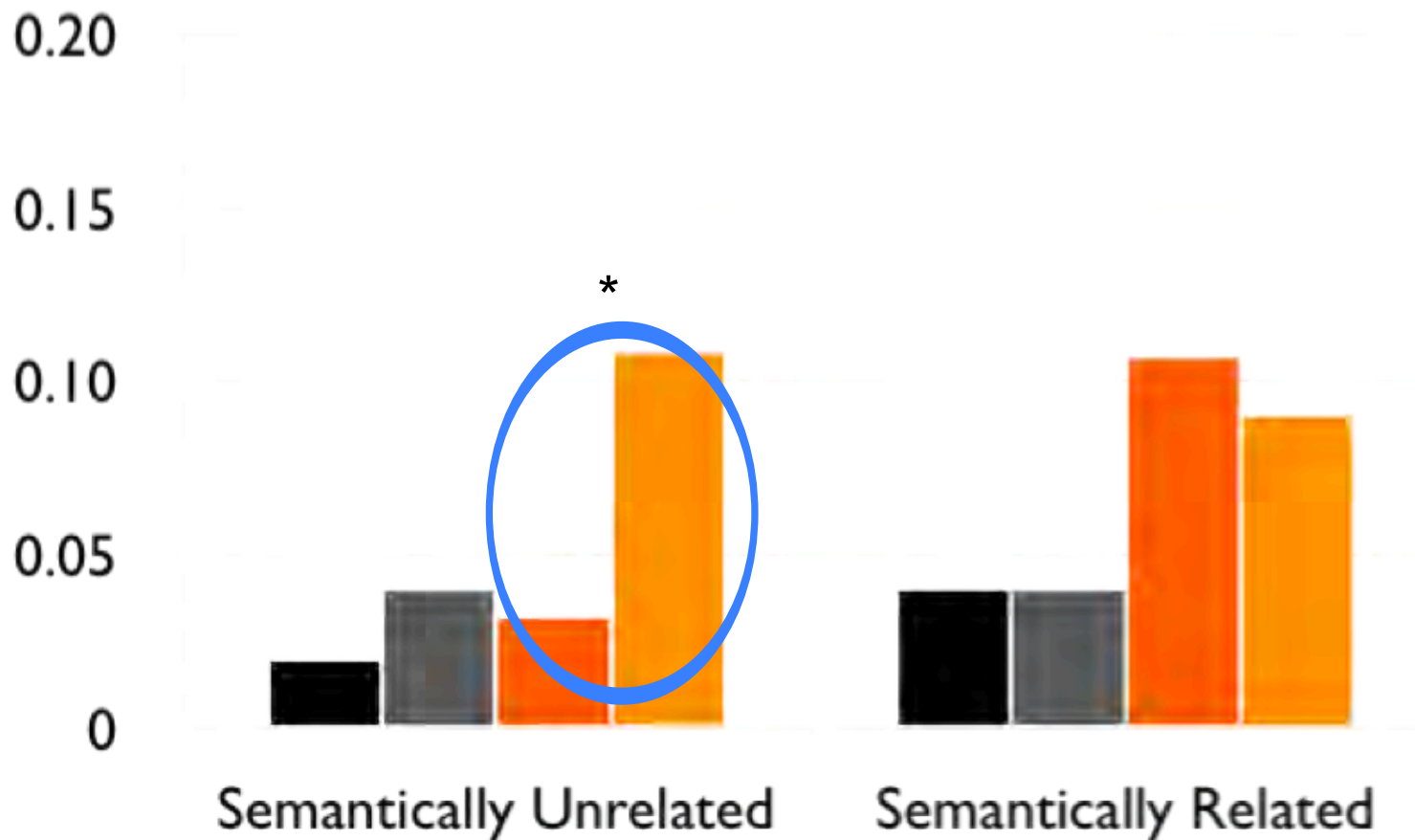
Hearing bilinguals show unexpected effect on English



Error Analysis II

ASL signers make more errors

- DGS - Control
- DGS - Implicit
- ASL - Control
- ASL - Implicit





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)

MOTHER - FATHER
CONGRESS - SENATE

Inhibition




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

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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