

Iconic priming and metaphoric mapping in deaf signers of American Sign Language

F. Schaller^{1,2}, K. Emmorey³, B. Lee³, Z. Sevcikova Sehyr³, C. O'Grady³

¹Experimental Neurolinguistics Group, Bielefeld University

²Cluster of Excellence "Cognitive Interaction Technology", Bielefeld University

³San Diego State University Laboratory for Language and Cognitive Neuroscience

Introduction

The iconicity of signs of American Sign Language (ASL) does not seem to influence signers' language processing (Bosworth & Emmorey, 2010). However, this might be different for metaphor comprehension (see Taub, 2001). According to the Double Mapping Constraint (DMC) proposed by Meir (2010), iconic signs used in a metaphorical expression must preserve the structural mapping between

- 1) the articulators and the concrete source domain and
- 2) the source and the target domains.

Thus, the signed translation equivalents of some common metaphors in spoken languages are impossible to express in sign languages. For instance, the English metaphor *The acid ate the metal* cannot be expressed by means of the iconic sign EAT which depicts holding food and bringing it to the mouth in sign languages such as ASL because the connotation of the metaphor is the act of consumption, a concept that is not depicted by the iconic sign EAT.

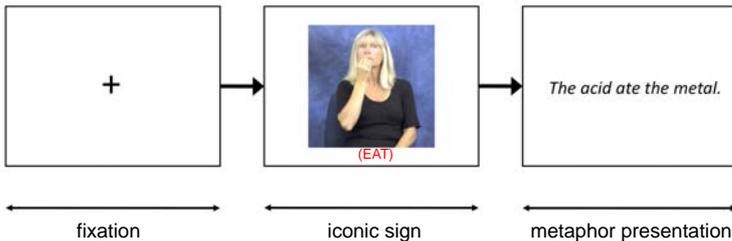
In the current behavioral RT-experiment, we examined deaf native ASL signers' comprehension of written English (L2) metaphors against the background of the restrictions of the DMC. We thus investigated the role of the DMC in language processing and whether the presentation of iconic sign primes would affect metaphor comprehension in English.

Material & Method

- 24 deaf native ASL signers:
 - mean age = 30.4 years, SD = ±5.6
 - right-handed
 - skilled readers of English

prime trials: related iconic prime + metaphor

30 metaphors complying with the DMC (e.g., *Communication collapsed*).
30 metaphors violating the DMC (e.g., *The acid ate the metal*).



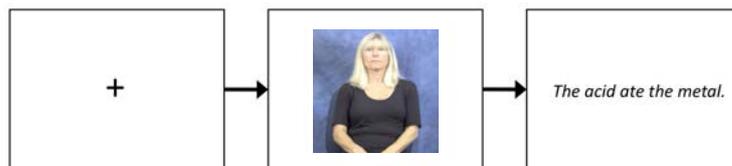
control trials: unrelated iconic prime + metaphor

30 metaphors complying with the DMC (e.g., *Communication collapsed*).
30 metaphors violating the DMC (e.g., *The acid ate the metal*).



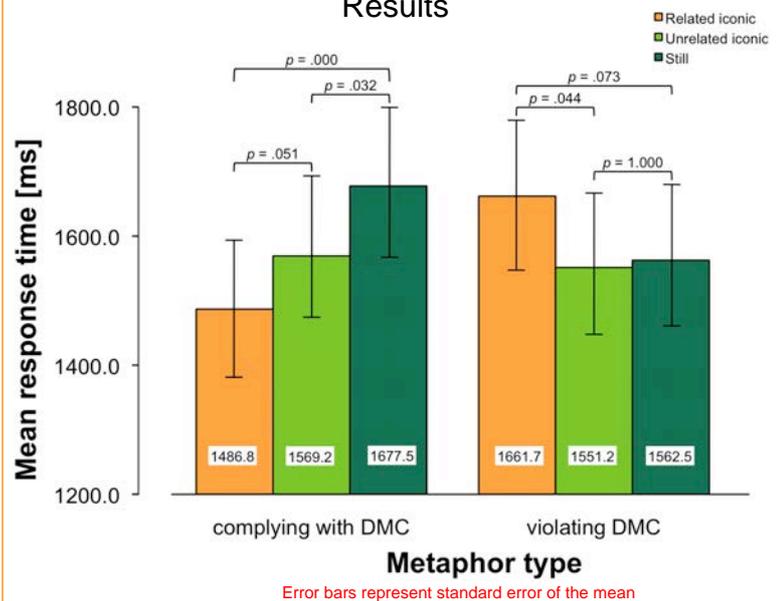
baseline trials: still prime + metaphor

30 metaphors complying with the DMC (e.g., *Communication collapsed*).
30 metaphors violating the DMC (e.g., *The acid ate the metal*).



- combination of prime and metaphor type was counterbalanced; each participant read each metaphor only once
- participants judged sensibility of sentences: 20 anomalous sentences were added to the metaphor list (e.g., *The ever is flailig present monkey*).

Results



- no main effect of either prime or metaphor type; only interaction effects
- facilitation effect when related signs preceded metaphors that complied with the DMC when translated into ASL (stronger than the facilitation caused by unrelated signs)
- interference effect if related signs preceded metaphors that violated the DMC when translated into ASL

Discussion

- Deaf ASL signers' L1 (ASL) interacts with metaphor comprehension in their L2 (English):
 - related iconic primes facilitated access to the metaphorical meaning of sentences that complied with the DMC
 - related iconic primes of the ASL sign prime hindered participants' access to the metaphorical meaning of sentences that violated the DMC
- ASL signers are sensitive to the DMC when processing metaphors in their L2.

Acknowledgements

This research was supported by the Cluster of Excellence Cognitive Interaction Technology 'CITEC' (EXC 277) at Bielefeld University, funded by the German Research Foundation (DFG), and a grant from the National Institutes of Health (R01 DC010997) to Karen Emmorey.

References

- Bosworth, R. G., & Emmorey, K. (2010). Effects of iconicity and semantic relatedness on lexical access in American Sign Language. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 36(6), 1573-1581.
- Meir, I. (2010). Iconicity and metaphor: Constraints on metaphorical extension of iconic forms. *Language*, 86(4), 865-896.
- Taub, S. F. (2001). *Language from the body: Iconicity and metaphor in American Sign Language*. Cambridge: Cambridge University Press.