Phonological word-object mapping is contingent upon the nature of the visual environment

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Introduction

- Listeners' fixation behavior is determined by a **tug of war** between knowledge retrieved from linguistic and visual input
- Matches between information retrieved from both modalities happen at phonological, semantic, and visual levels of representation [1]
- On hearing Dutch base word *beker*, 'beaker' and seeing a **phonological** (a beaver, *bever*), a **shape** (a bobbin, *klos*), and a **semantic** (a fork, *vork*) competitor, phonological bias preceded shape and semantic bias

- The same visual objects as in [1] were embedded in semi-realistic line drawings
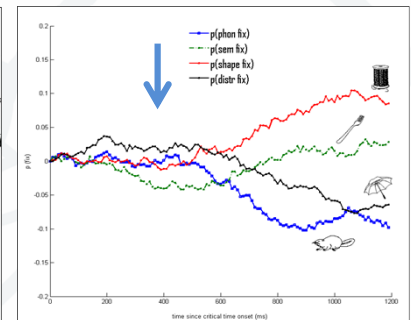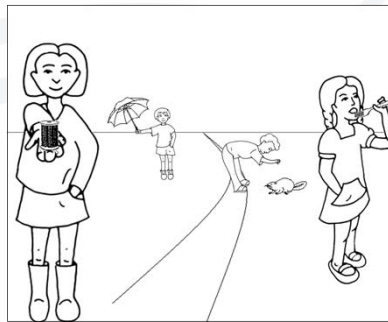
Hypothesis

- Visual and semantic context induces visual and semantic mode of processing at the expense of mapping at the phonological level
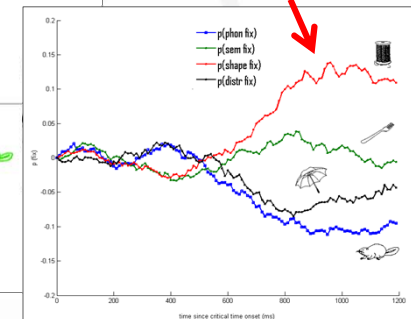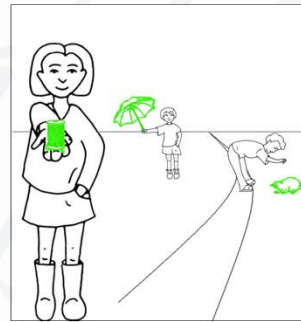
Results (Exp 1)

- Biases for semantic and visual shape competitors
- ***Phonological bias observed in [1] absent***
- Some evidence of phonological inhibition suggests word names have been retrieved
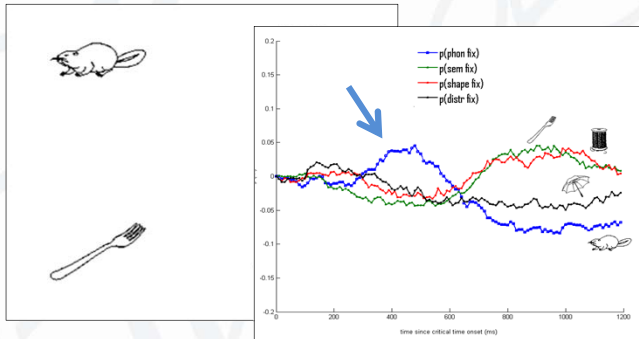
Experiment 1

Experiment 2

Replication of Huettig & McQueen (2007) with an active task

Experiment 3

Increase of objects' saliency in the scene by highlighting their contours

Experiment 4

Independent naming task before eye-tracking experiment
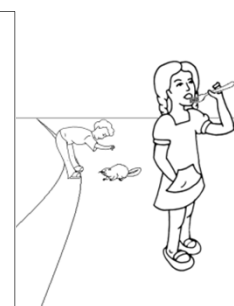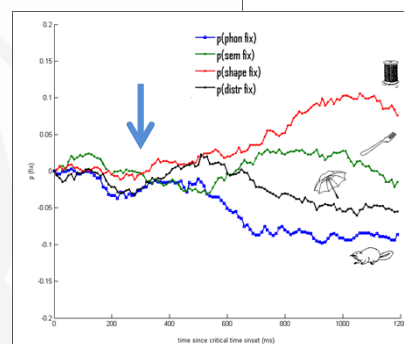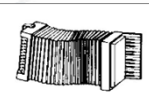

Conclusion

- Phonological word-object mapping is contingent upon complexity of visual display and scene content
- Complex displays induce visual and semantic modes of processing (cf. [2])

Open issues

- High working memory demands, i.e., increased number of objects, responsible for lack of phonological mapping?
- Language-mediated eye movements (at least partially) under substantial control processes
- Complete account of language-mediated eye gaze will have to include inhibitory mechanisms.

References

[1] Huettig, F., & McQueen, J. M. (2007). The tug of war between phonological, semantic and shape information in language-mediated visual search. *Journal of Memory and Language, 57*(4), 460-482. [2] Huettig, F., & McQueen, J. M. (2011). The nature of the visual environment induces implicit biases during language-mediated visual search. *Journal of Memory & Cognition, 39*(6), 1068-1084.