



Offline effects but no online differences in  
phrasal meaning composition including  
intersective vs. subsective adjectives

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*ELM poster presentation 2020*  
#68



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# ERP correlates of phrasal meaning composition

<i>Det.</i>	<i>Adj</i>	↓EEG	<i>Composition</i>	<i>Denotation Question</i>	<i>Typicality Question</i>
en a	grønn green	skilpadde turtle	Syn+ Sem+ [Adj N]=[Adj]∩[N]	Is it a common turtle? <b>Yes</b>	Is it a green animal? <b>Yes</b>
en an	rosa pink	skilpadde turtle	Syn+ Sem+ [Adj N]=[Adj]∩[N]	Is it a common turtle? <b>No</b>	Is it a pink animal? <b>Yes</b>
en a	langsom slow	skilpadde turtle	Syn+ Sem+ [Adj N]⊆[N]	Is it a common turtle? <b>Yes</b>	Is it a slow animal? <b>Yes</b>
en a	rask fast	skilpadde turtle	Syn+ Sem+ [Adj N]⊆[N]	Is it a common turtle? <b>No</b>	Is it a fast animal? <b>No</b>

## Typicality

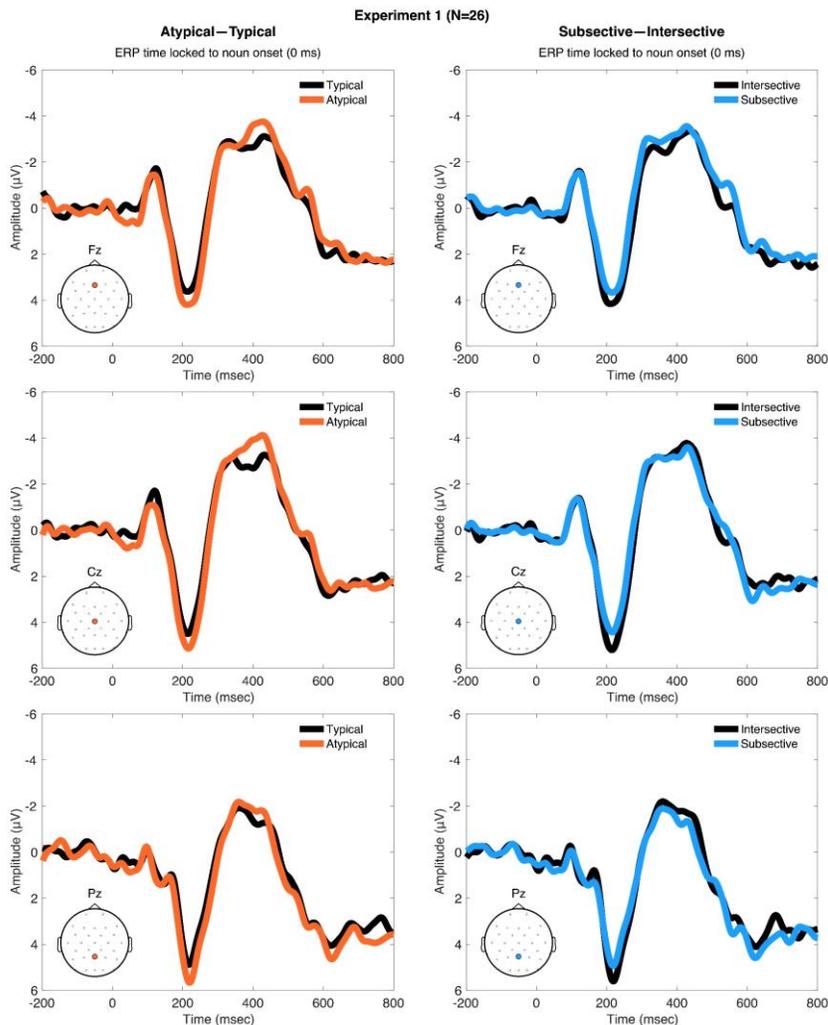
- Typical
- Atypical

## Denotation

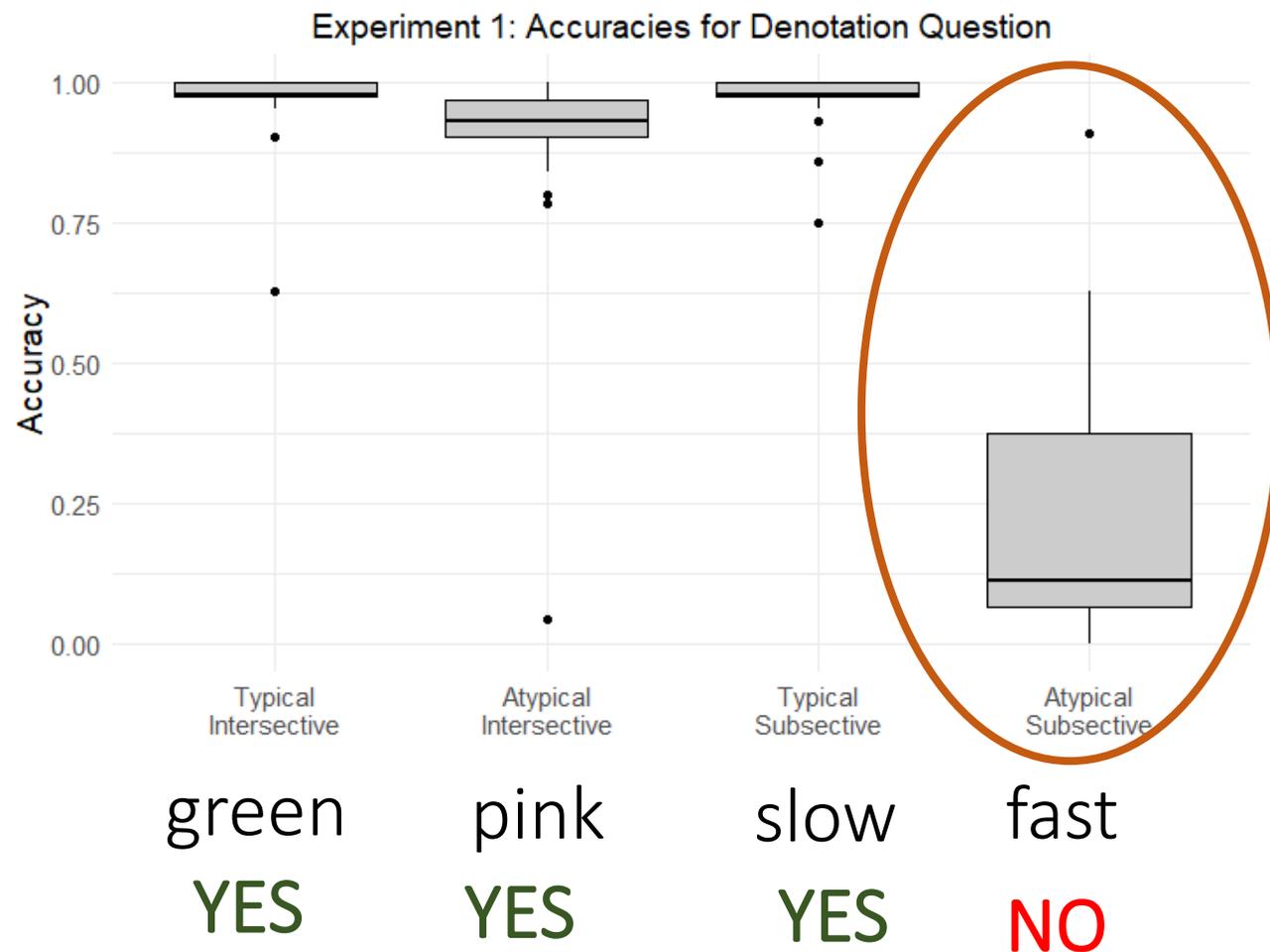
- Intersective
- Subsective

Expected answers based on linguistic theory

# Experiment 1

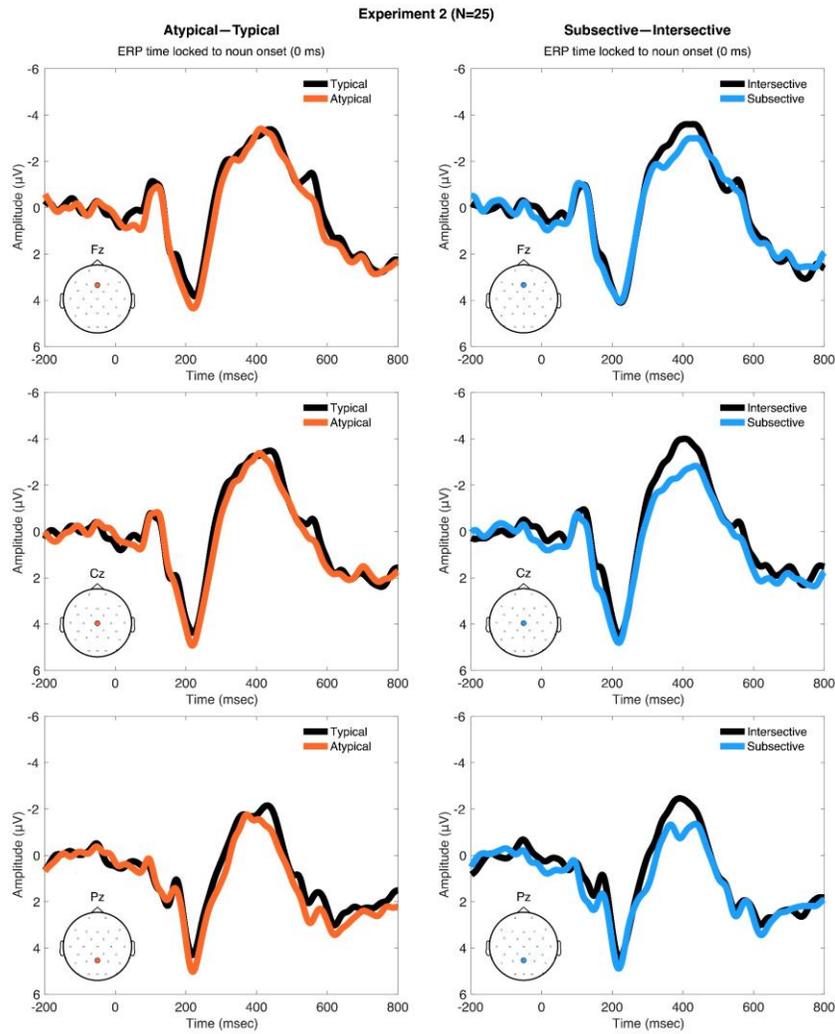


No significant clusters: Cluster-based permutation tests across the whole epoch (0-800 ms)



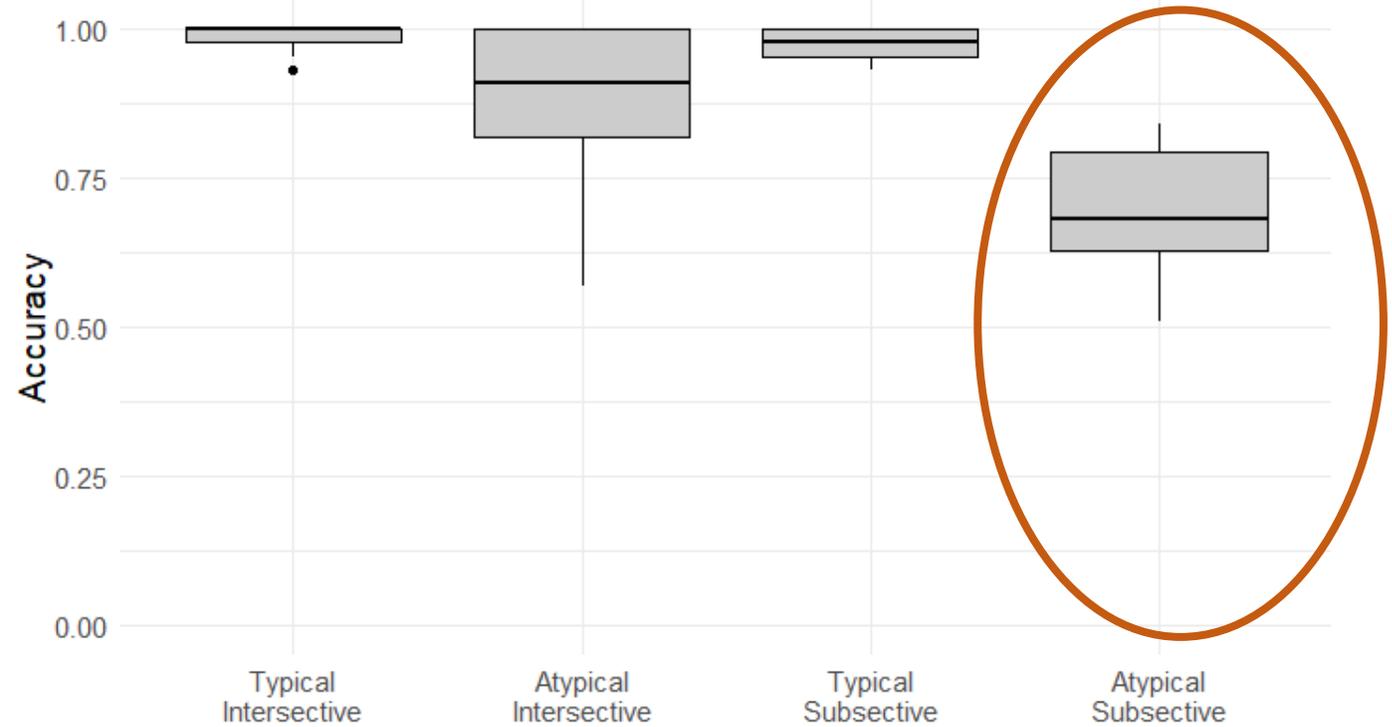
Is it a XX animal?

# Experiment 2



Difference: Participants were taught the intersective/subjective distinction plus given feedback after each trial.

Experiment 2: Accuracies for Denotation Question



green  
YES

pink  
YES

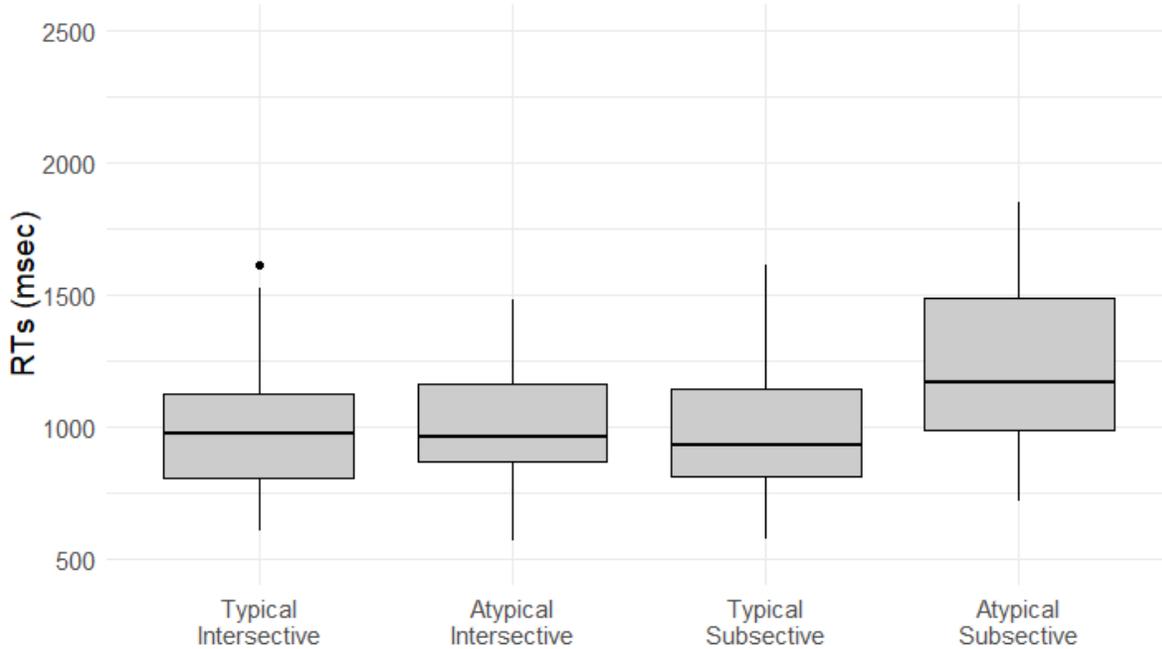
slow  
YES

fast  
NO

Is it a XY animal?

# Experiment 2 (RTs)

Experiment 2: RTs (msec) for Typicality Question



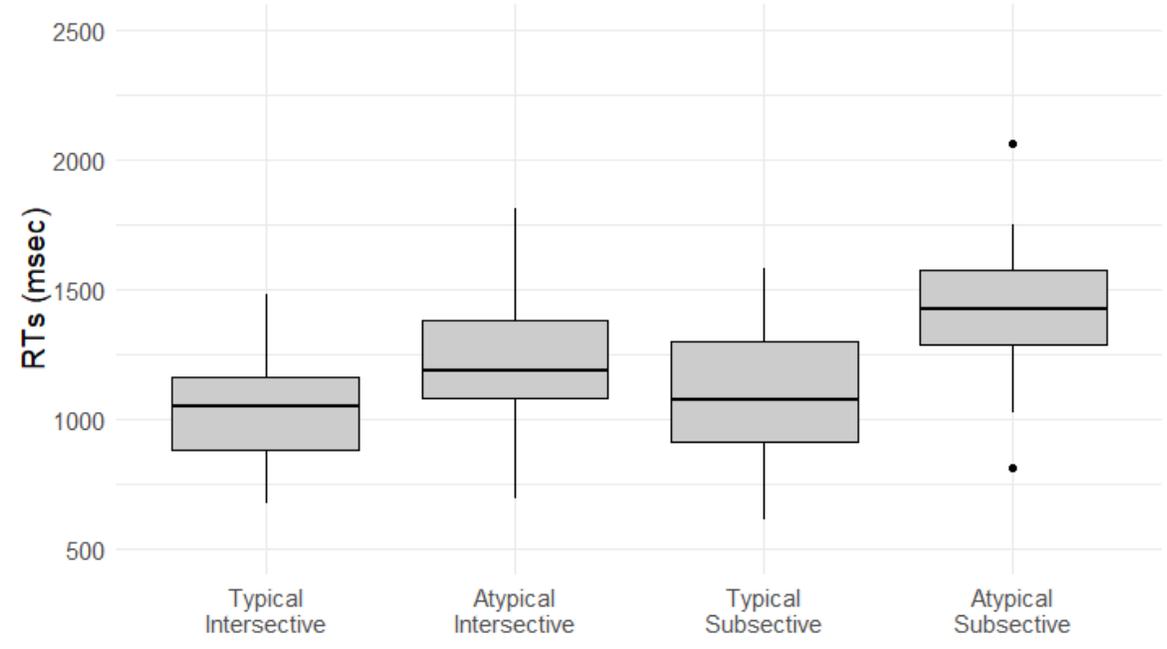
green      pink      slow      fast  
YES      NO      YES      NO

Is it a common turtle?

Effect of Denotation:  $p < .0001$

Denotation \* Typicality:  $p = .0001$

Experiment 2: RTs (msec) for Denotation Question



green      pink      slow      fast  
YES      YES      YES      NO

Is it a XY animal?

Effect of Typicality:  $p < .0001$

Effect of Denotation:  $p < .0001$

Denotation \* Typicality:  $< .0001$

# Discussion

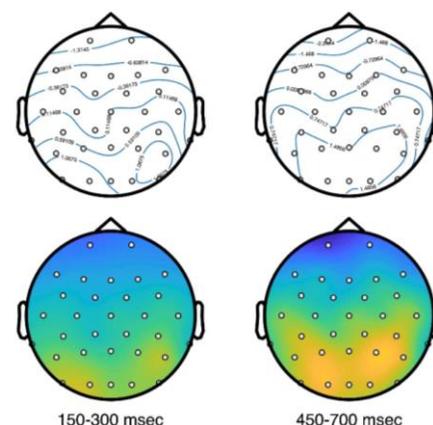
- **Difference between online and offline processing**  
Possibly speakers can assign “**maximal meanings**” to all or most phrases (offline results) as outlined in linguistic theory, but it is unclear whether such capacity actually plays out online during processing (ERP null results)
- Interpretation of the null results in light of the “**good enough**” approach to language comprehension (Ferreira et al. 2002)
- **Null results of Typicality seemingly contradict a large body of ERP studies**
  - But earlier work always used sentences or discourse contexts.
  - Federmeier et al. (2010) showed that low typicality items trigger N400 components whose amplitudes fall between high typicality and incongruous target words. Maybe manipulation not strong enough within a phrasal context?
  - Molinaro et al. (2012) found no N400 effects of typicality in phrases embedded in sentences.

# ERP Effect of Composition

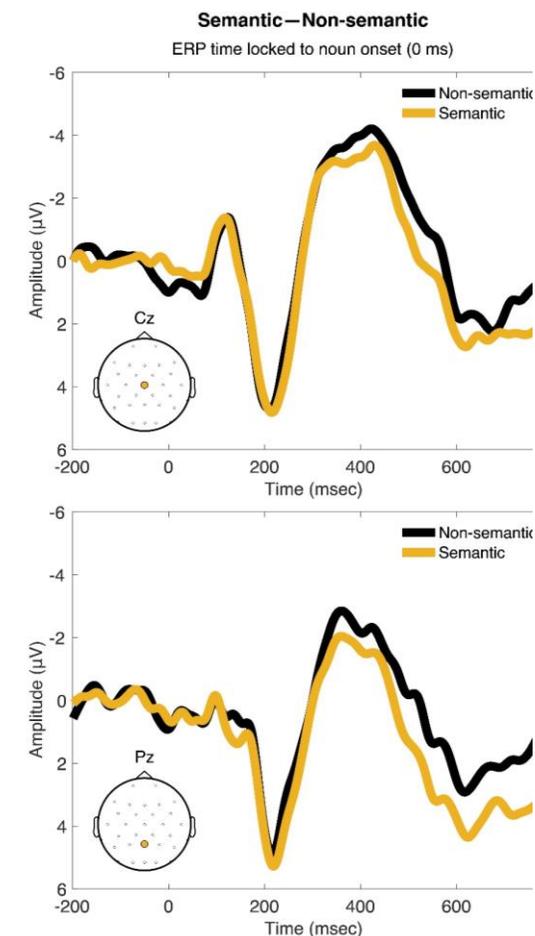
Experiments also included two baseline conditions

<i>Det.</i>	<i>Adj</i>	↓ <i>EEG</i>	<i>Composition</i>	<i>Denotation Question</i>
en <i>a</i>	xkqh [nonword]	skilpadde <i>turtle</i>	Syn- Sem-	Is it an animal?
en <i>a</i>	tæff [pseudoword]	skilpadde <i>turtle</i>	Syn+ Sem-	Is it an animal?

- Comparison: Non-semantic conditions vs. all four adjective conditions
- P600 composition effect
- Same effect was found in Ex1 & Ex2 plus in Fritz & Baggio (2020)



## Experiment 2



# References

- Federmeier, K. D., Kutas, M., & Schul, R. (2010). Age-related and individual differences in the use of prediction during language comprehension. *Brain and language*, 115(3), 149-161.
- Ferreira, F., Bailey, K. G. D., & Ferraro, V. (2002). Good-Enough Representations in Language Comprehension. *Current Directions in Psychological Science*, 11(1), 11–15.  
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- Fritz, I., & Baggio, G. (2020). Meaning composition in minimal phrasal contexts: Distinct ERP effects of intensionality and denotation. *Language, Cognition and Neuroscience*.  
10.1080/23273798.2020.1749678
- Molinaro, N., Carreiras, M., & Duñabeitia, J. A. (2012). Semantic combinatorial processing of non-anomalous expressions. *Neuroimage*, 59(4), 3488-3501.  
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