

## Research challenge

- Identification & interpretation of written words
- years of research – important progress:
  - Orthographic processing (e.g. Davis, 2010)
  - Morphological processing (e.g., Rastle et al., 2000)
  - Semantic processing (e.g., Meteyard et al., 2012)
  - Sentence processing (e.g., Frazier, 1987)
- Many questions remain to be answered

Usually addressed

- Non-ecological designs
- Semantic/syntactic violations
- Rapid serial stimuli presentation
- Word in isolation
- Self-paced reading

Current study

- Everyday-like stimuli
- No violations
- No manipulations
- Complete sentences

New paradigm

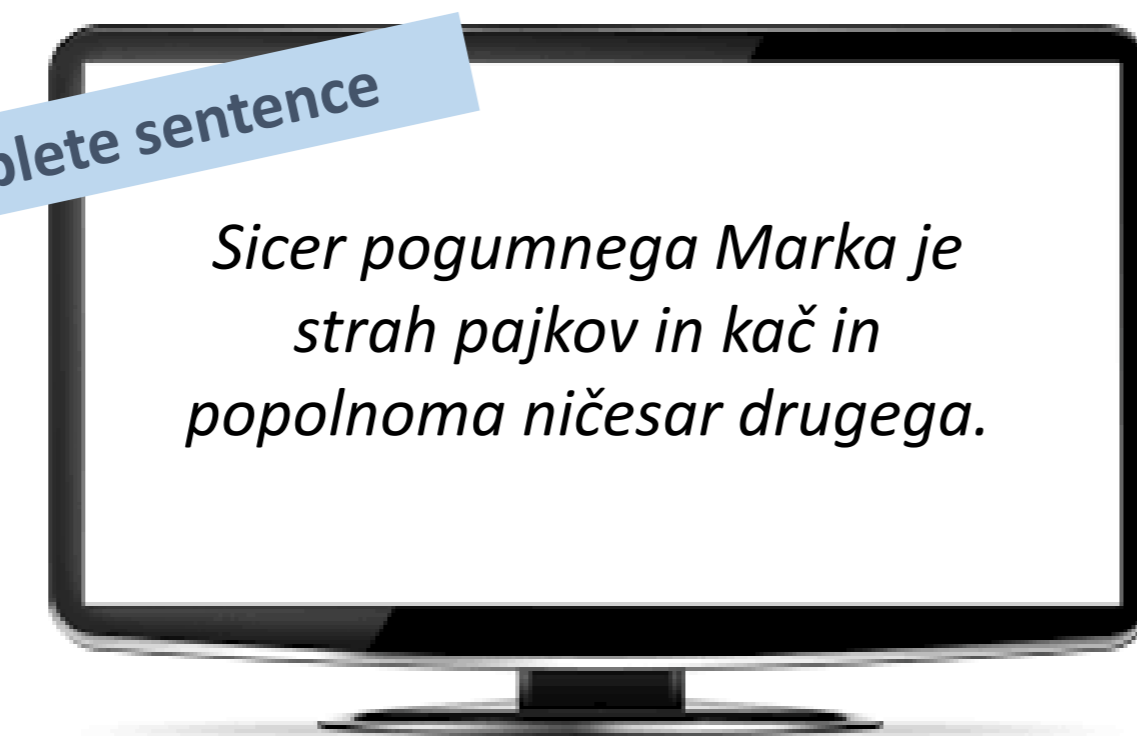


## Priming effect in eye-tracking during natural reading

Priming effect:

- When **target** preceded by related **prime** word:
  - faster & more accurate processing
  - cf. unrelated prime word
- Observed in behavioural, fMRI, ERP and eye-tracking studies
- In sentence context:
  - Yields mixed results in semantic priming
  - No clear evidence in morphological priming

Complete sentence



## Design & Task

- 4 conditions:

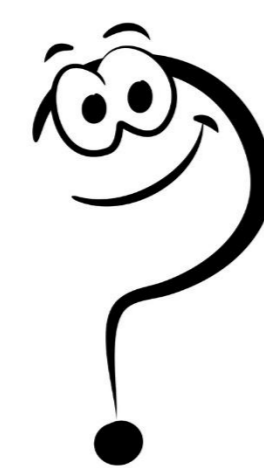


- 1. semantically +, morpho-syntactically +**  
Sicer pogumnega Marka je strah **pajkov** in **kač** in popolnoma ničesar drugega.  
Otherwise brave Mark is afraid of **spiders** (PL) and **snakes** (PL) and of nothing else.
- 2. semantically +, morpho-syntactically –**  
Sicer pogumnega Marka je strah **pajka** in **kač** in popolnoma ničesar drugega  
Otherwise brave Mark is afraid of **a spider** (SG) and **snakes** (PL) and of nothing else.
- 3. semantically –, morpho-syntactically +**  
Sicer pogumnega Marka je strah **dvigala** in **kač** in popolnoma ničesar drugega  
Otherwise brave Mark is afraid of **elevators** (PL) and **snakes** (PL) and of nothing else.
- 4. semantically –, morpho-syntactically –**  
Sicer pogumnega Marka je strah **dvigala** in **kač** in popolnoma ničesar drugega  
Otherwise brave Mark is afraid of **an elevator** (SG) and **snakes** (PL) and of nothing else.

- 160 grammatically correct sentences (40 sentences/condition)
- Manipulation on the prime only, target word same in all conditions
- No determiners preceding the noun
- Grammatical number expressed only in the suffix of the word  
eg. hiša (a house) – hiši (two houses) – hiše (3+ houses)

## Research questions

Will there be semantic / morpho- syntactic cross-word priming effect?



Would match/mismatch in the morpho-syntactic property (grammatical number) modulate semantic priming effect?

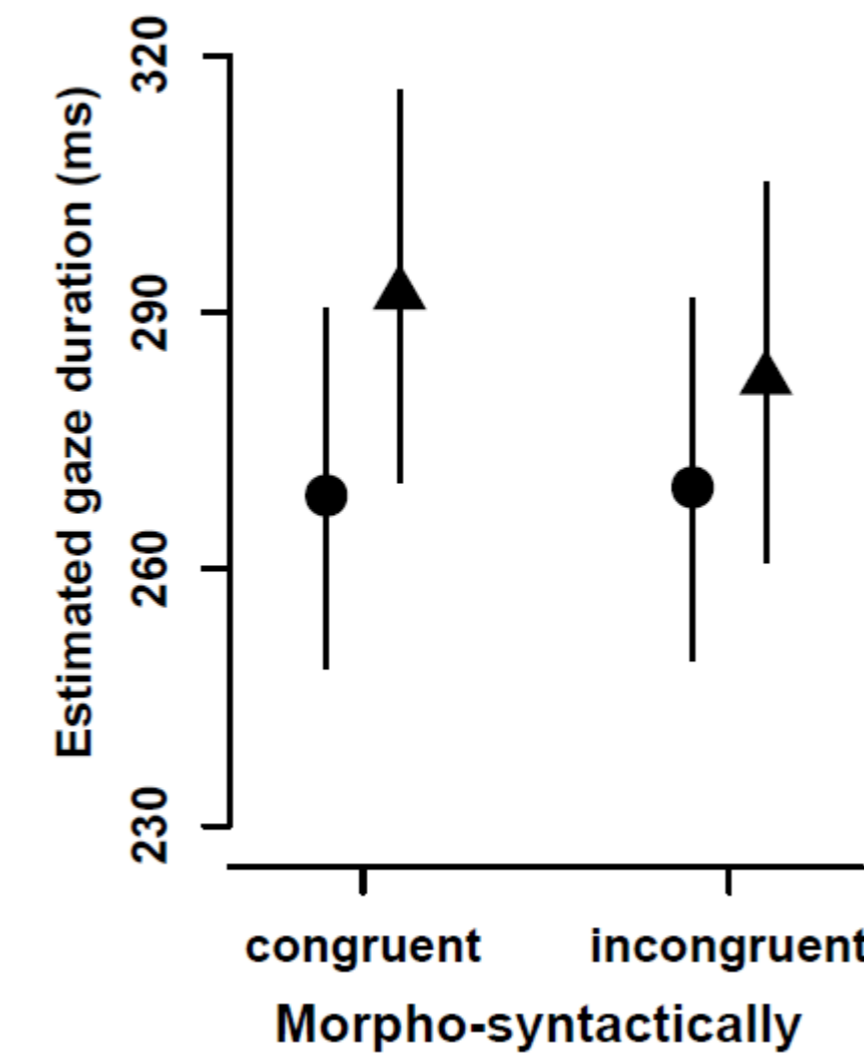
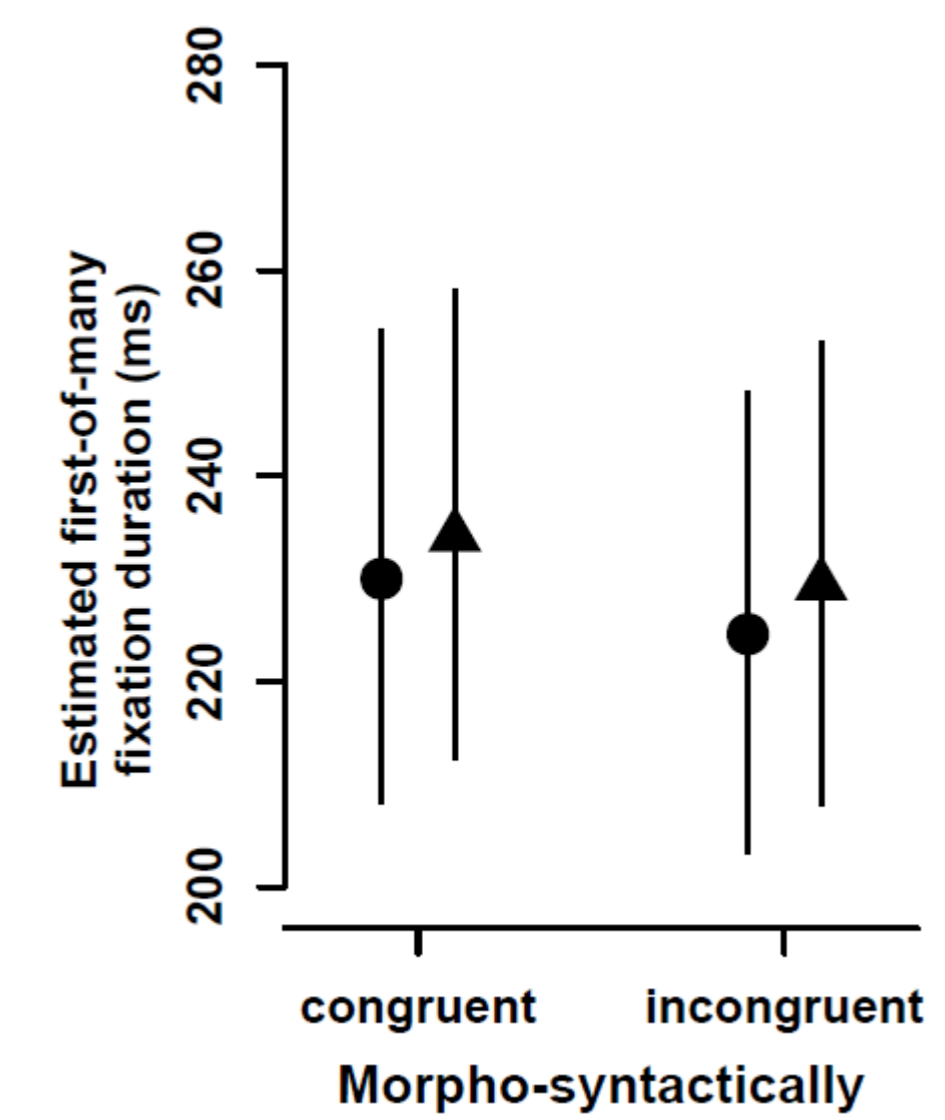
## Results

Participants:  
- N = 44 (F = 28)  
- Native Slovenian speakers

In all plots:  
● Semantically congruent  
▲ Semantically incongruent  
Error bars: 95% CI

### First-of-many fixation duration

Semantic priming effect:  
 $F(1, 1142)=.17, p=.68$   
Morpho-syntactic priming effect:  
 $F(1, 1142)=.22, p=.64$   
Interaction:  
 $F(1, 1142)=.001; p=.97$

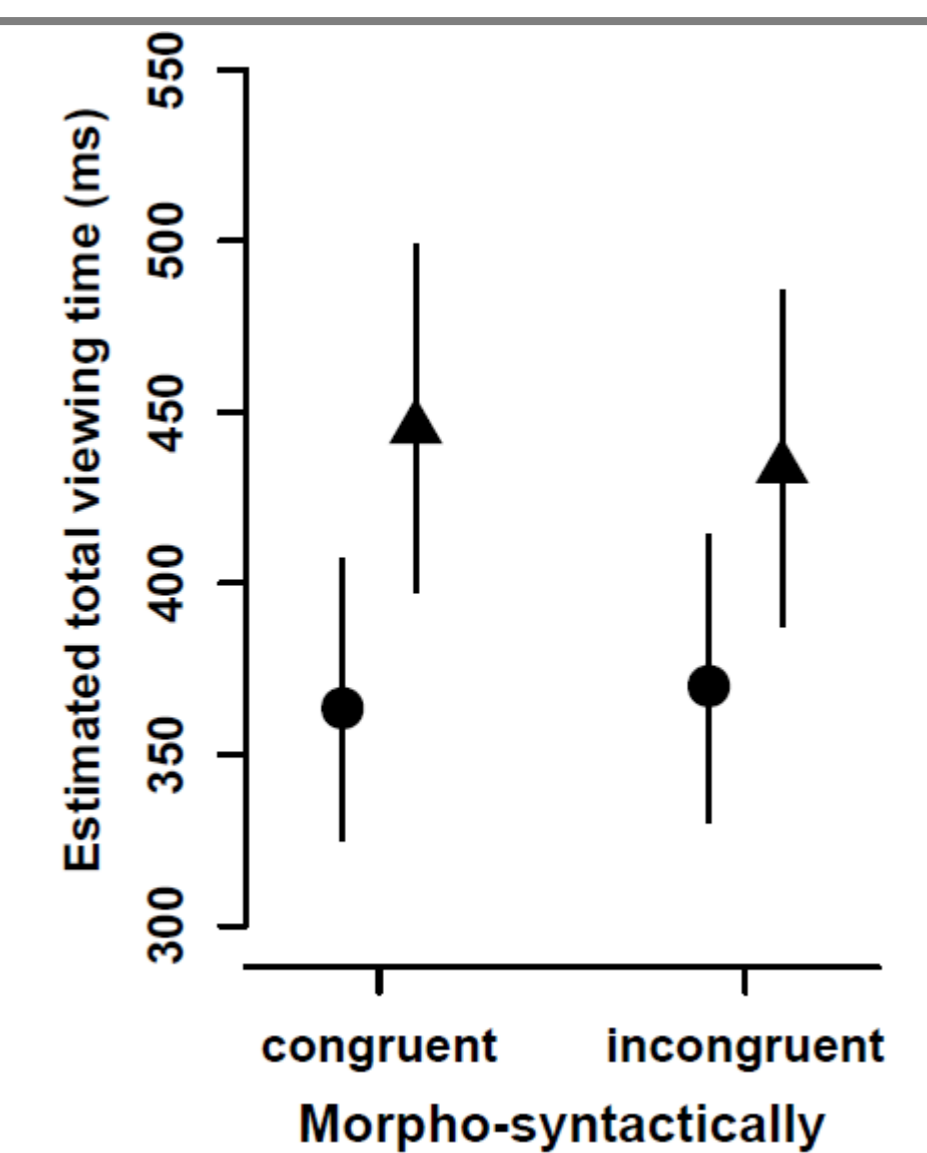


### First run gaze duration

Semantic priming effect:  
 $F(1,2736)=6.4, p=.01$   
Morpho-syntactic priming effect:  
 $F(1, 2736)=.3, p=.5$   
Interaction:  
 $F(1,2736)=.5, p=.4$

### Total viewing time

Semantic priming effect:  
 $F(1, 2105)=20.2, p=.00001$   
Morpho-syntactic priming effect:  
 $F(1, 2105)=.01, p=.9$   
Interaction:  
 $F(1, 2105)=.3, p=.5$



## Conclusion

- Cross-word priming at the semantic level
- Morpho-syntax does not seem to play any role, not even in modulating the semantic effect
- No effect in earlier measures of eye movement behaviour (first-of-many fixations)
- Novel design:
  - allows for comparison with the well-established priming paradigms with words in isolation
  - makes the transition from isolated-word identification to the natural sentence reading
- Insight into how priming influences eye movement during normal reading
- Contribution towards understanding of the influence of higher order language processing on the identification of words during reading
- Study speaks to the debate between sequential and parallel models of reading? (e.g., Reichle et al., 2003; 2009; Pollatsek et al., 2006; Engbert et al., 2002, 2005)

## References

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