

# When exactly corners stop corning?

## Incremental masked priming and complex word identification

davide.crepaldi@unimib.it  
www.davidecrepaldi.net



Simona Amenta, Anais De Santis, Elena Angela Morone & Rocco De Marco  
[Department of Psychology, University of Milano Bicocca, Italy]

Davide Crepaldi

[Department of Psychology, University of Milano Bicocca, Italy]

Marco Marelli

[Centre for Mind/Brain Sciences, University of Trento, Italy]

### FORM THEN MEANING?

Several masked priming experiments show equivalent priming for **genuine complex words** (e.g., dealer-DEAL) and **pseudo-complex words** (e.g., corner-CORN) [e.g., Longtin et al., 2003; Rastle et al., 2004; Marelli et al., 2013].

Other experiments, despite confirming priming in pseudo-morphological pairs, also demonstrate **more facilitation from truly derived primes** [e.g., Feldman et al., 2012; Järvikivi & Pykkönen, 2011].

This **experimental debate** has improperly turned into a **theoretical debate**. People finding the former pattern of result propose that morphological analysis is first informed only by orthographic appearance [e.g., Crepaldi et al., 2010], whereas people finding the latter pattern of results propose that semantics is a factor right from the earliest stages of processing [e.g., Feldman et al., 2012].

Here we take a new look at this issue by using **incremental masked priming** [e.g., Jacobs et al., 1995].

### INCREMENTAL MASKED PRIMING

Trial timeline identical to classic masked priming, but:

- Many SOAs in the same experiment
- No control prime: the baseline is the shortest SOA (~10 ms)
- All SOAs below the awareness threshold (< 60 ms)

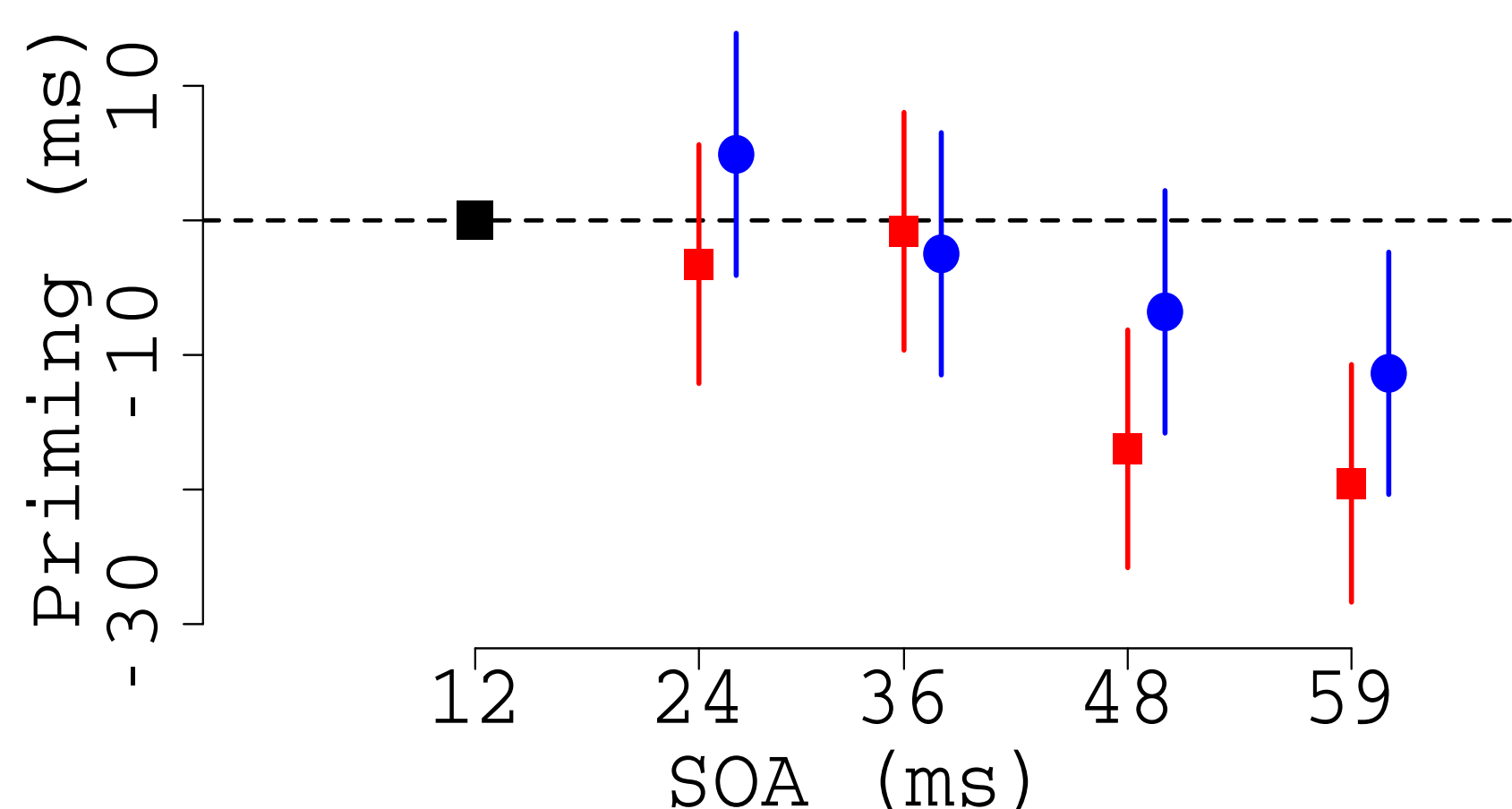
Two big advantages:

- Reduced variability
- Track time pattern of the effects

### EXPERIMENT 1

• 95 items for each of three conditions: **TRANSPARENT** (dealer-DEAL), **OPAQUE** (corner-CORN) and **FORM** (dialog-DIAL). In the FORM condition the final part of the prime (-og, in the example) is not a morpheme.

- **Five SOAs**, one to five refresh cycles on a 85-Hz screen (i.e., 12, 24, 36, 48 and 59 ms)
- **207 participants**
- **Mixed models** with crossed random intercepts for target words and participants. List effects (e.g., item position in the series, RT on the preceding trials) and target features (e.g., length, frequency) used as covariates.
- **Results**: blue is opaque priming and red is transparent priming, both pitted against form priming. Bars are 95% CI.



### REFERENCES

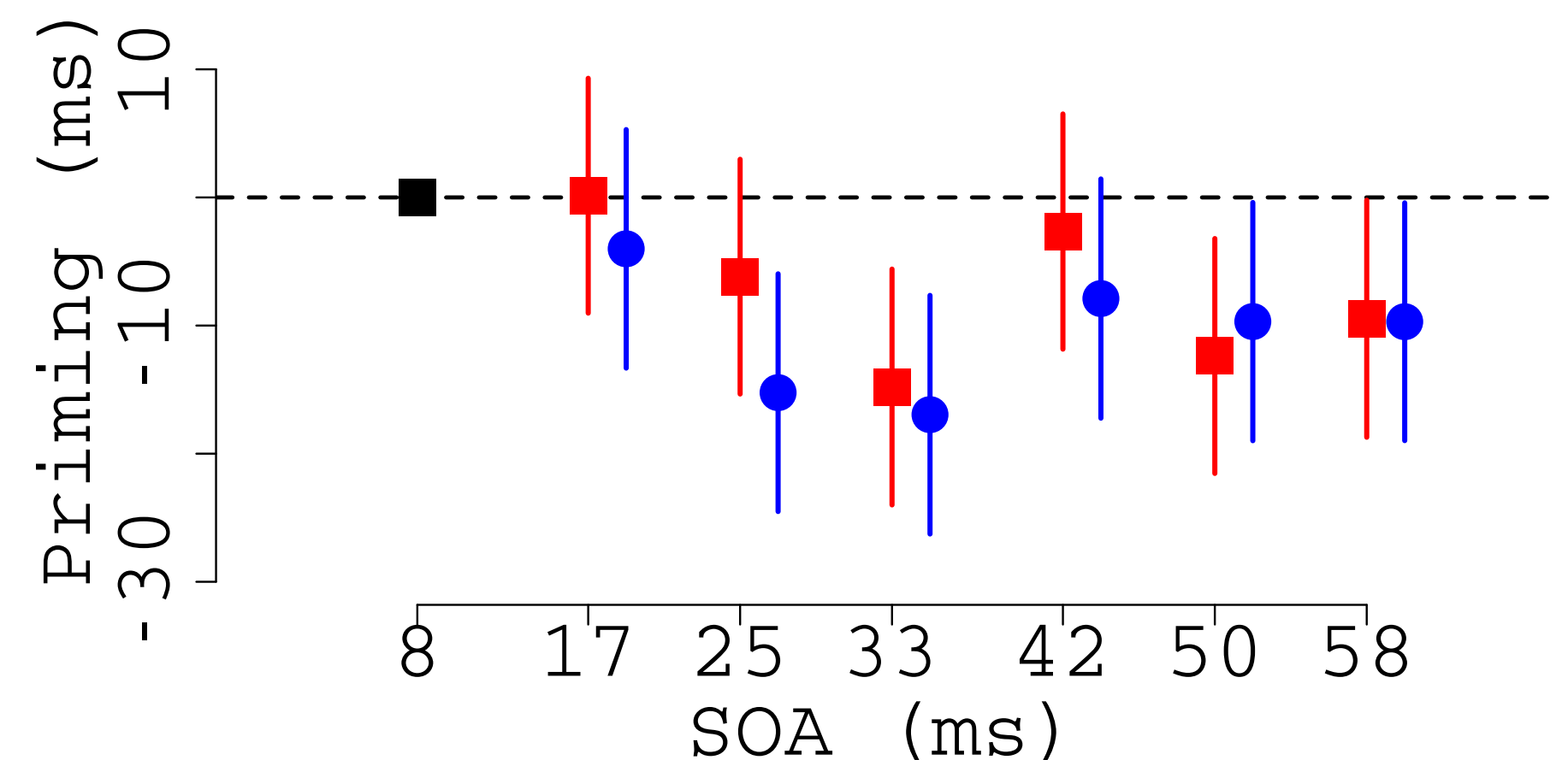
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### EXPERIMENT 2

• Everything identical to Exp 1 but:

- **Seven SOAs**, one to seven refresh cycles on a 120-Hz screen (i.e., 8, 16, 25, 33, 41, 50 and 58 ms)
- 141 new participants

• **Results**: blue is opaque priming and red is transparent priming, both pitted against form priming. Bars are 95% CI.



### VOCABULARY AND OSC

**Vocabulary** was measured for all participants in Exp 2. It contributes explained variance, but does so only through a main effect, i.e., people with wider vocabulary are generally faster.

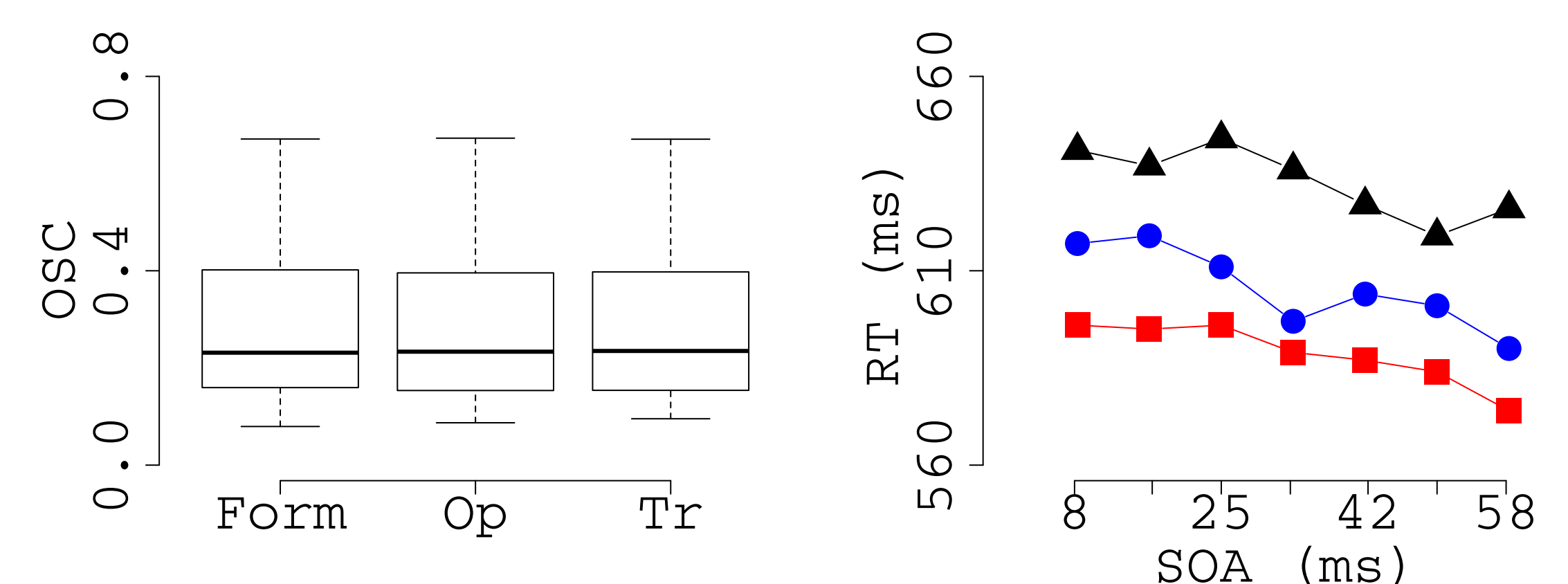
**No interaction with priming** whatsoever (contra Andrews and Lo, 2013).

**Orthographic-semantic consistency (OSC)** is a measure of how strongly the meaning of a stem can be gauged from its form. Whenever one sees the letter cluster WIDOW-, she knows that the word will have something to do with a woman who lost her husband (WIDOWER, WIDOWED, WIDOWHOOD). These stems have **high OSC** values and **are identified more quickly** [Marelli et al., in press].

When one sees the letter cluster CORN, she doesn't know whether she's reading about cereals (as in CORN) or about a region in England (as in CORNISH). These stems have **low OSC** values and **are identified more slowly**.

Transparency and OSC covariate: is the priming-by-transparency interaction a **priming-by-OSC interaction?**

We selected a subset of items where OSC was matched in transparent, opaque and form targets (left panel). **SOA did not interact with condition** anymore,  $F[12,648]=.629$ ,  $p=.82$  (right panel).



### CONCLUSIONS

- The priming pattern in transparent and opaque words changes with SOA. This may explain inconsistencies in the existing literature.
- There seems to be a time window where opaque and transparent priming are equivalent, but also one where transparent priming is larger than opaque priming.
- OSC plays a major role in masked morphological priming.