

# The Priming of Informationally Weaker Alternatives: Antonyms and Negation

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## 1. INTRODUCTION

- Informational strength has been seen as key when it comes to scalar implicature (SI) derivation (Horn, 1972)
- Most accounts of SIs say that stronger alternatives are needed
  - Are stronger alternatives active in comprehenders' minds?**
- Ronai & Xiang (2023) tested the activation of strong scalars (*hot*) by weak ones (*warm*)
  - When they presented isolated scalar words, there was no priming
  - The strong terms were shown to be activated in a sentential context – suggesting involvement in SI derivation

## Which alternatives are relevant during online SI derivation?

## 2. HYPOTHESES & ACCOUNTS

- No activation when informational strength relations change
  - Negation** can reverse entailment relations (Horn, 1972)
    - Scalar words such as *hot* are no longer stronger than *warm*
  - Are **antonyms** also present in the process?

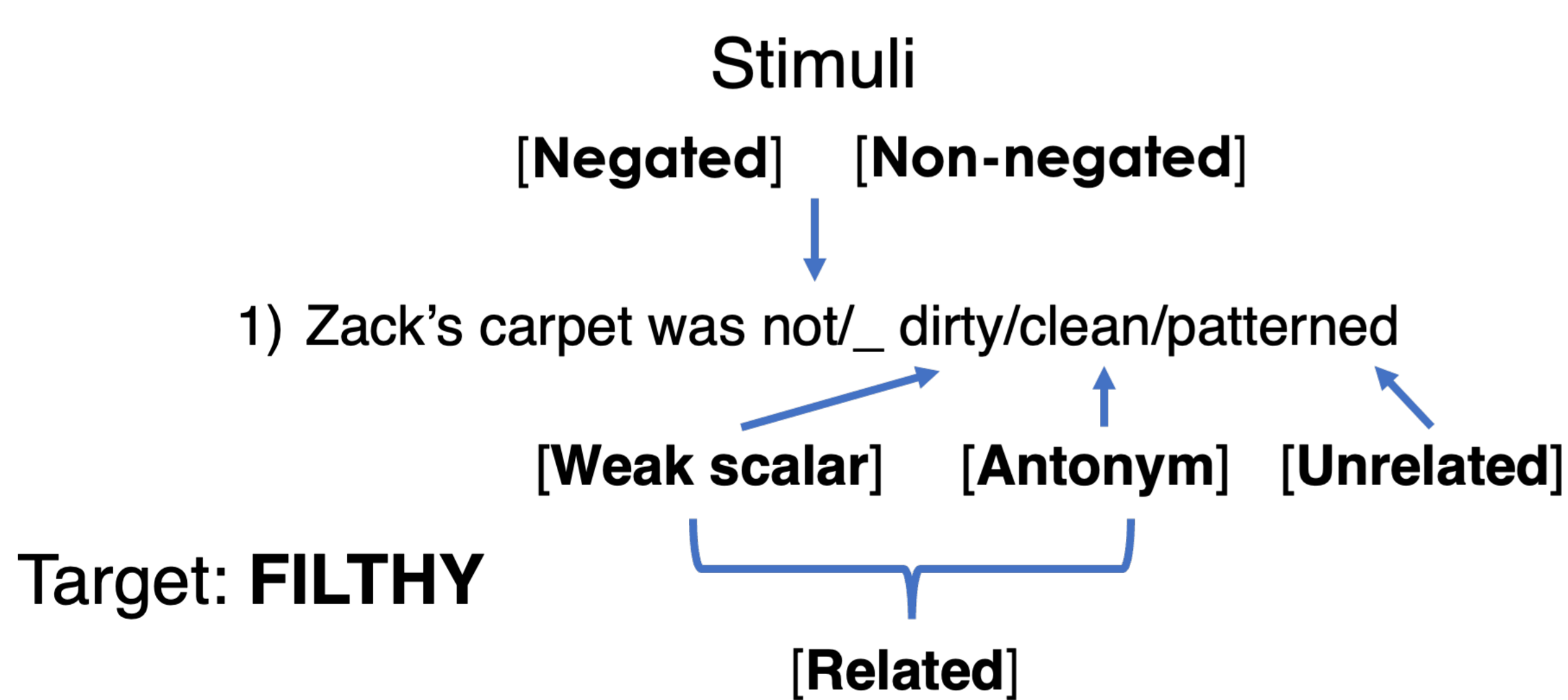
The **Scalar Account** (Horn, 1972) suggests that only stronger alternatives are relevant, antonyms play no role due to the split-scale assumption

The **Semantic Network Account** accounts for any alternative activation effects as simply epiphenomenal byproducts of spreading activation

The **Alternative Activation Account** proposes domain-general activation followed by selection based on contextual and grammatical factors (Gotzner, 2017)

## 4. METHODS

- Four lexical decision experiments on PCibex (N = 50 each)
- Single factor: Related vs unrelated
  - Related:** either **weak scalar** or **antonym**
- RSVP (350ms per word, 650ms SOA)
- Experiment 3: Only prime words (*clean*) and targets (*filthy*)
  - 150ms per prime, 650ms SOA



### SCALAR IMPLICATURES:



### LEXICAL DECISION TASK:

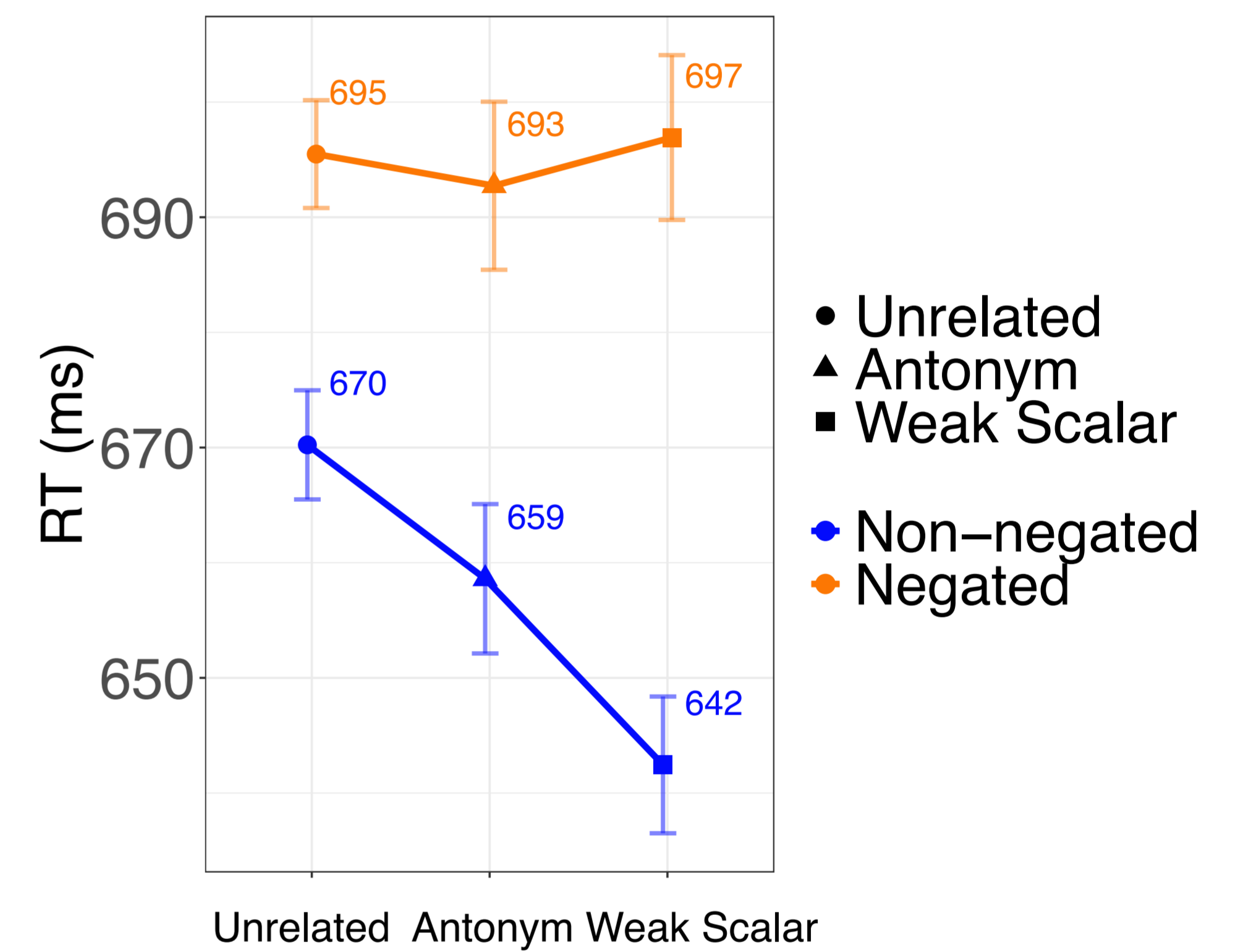


## 5. PREDICTIONS & RESULTS:

Account/ Prime type	Scalar Account	Semantic Network Account	Alternative Activation Account
Scalars	✓	✓	✓
Negated Scalars	✗	✓	✗
Antonyms	✗	✓	✓
Negated Antonyms	✗	✓	✗

Experiment	Estimate	SE	df	t-value	p-value
Exp 1: Negated weak scalars	0.0081	0.011	32.23	0.71	0.483
Exp 2: Antonyms in sentences	0.0238	0.008	2846	2.93	<b>0.0034*</b>
Exp 3: Antonyms in isolation	0.0248	0.009	2665	2.75	<b>0.0061**</b>
Exp 4: Negated antonyms	-0.001	0.013	29.37	-0.05	0.958

## COMBINED PLOT: EXP 1, 2, & 4 + EXP 3 (R&X, 2023)



## 6. RESULTS: COMBINED ANALYSIS

Combined data from Exp 1, 2, & 4 and Exp 3 from Ronai & Xiang (2023), which tested non-negated weak scalars. We created a 2 x 3 factorial design

**Negation:** Non-negated (baseline) vs. negated

**Prime:** Weak scalar vs. antonym vs. unrelated (baseline)

Factor	Estimate	SE	df	t-value	p-value
Negation	0.03	0.028	200.5	1.117	0.26513
Weak scalar	-0.04	0.009	8922	-4.390	<b>0.0001***</b>
Antonym	-0.023	0.009	8915	-2.625	<b>0.00867**</b>
Negation: Weak scalar	0.028	0.013	8917	2.164	<b>0.03049*</b>
Negation: Antonym	0.026	0.013	8917	1.954	0.05069

## 7. DISCUSSION

- Negation cancels the activation of targets**
  - Informational strength matters
- Negation influences activation differently when weak scalar vs antonym primes are used**
- Antonymic primes primed targets both in sentences and in isolation
  - An epiphenomenon in online SI derivation?
  - But see Doran et al. (2009) a.o. for evidence that non-entailed alternatives facilitate SI derivation
- Most compatible with the Alternative Activation Account**
  - Comprehenders seem to activate a slew of associates (antonyms) and then select depending on the grammar (negation) and context