



1. Introduction

- **Observation:** Sentence meanings are under-specified; listeners draw inferences to arrive at intended utterance meanings.
- **For example:** Indirect answers to polar questions
 - (1) A: Is Sue at work?
B: She is sick with the flu. (de Marneffe et al. 2009)

Overarching research question: How do linguistic and contextual factors affect listeners' calculations of utterance meanings in indirect answers? In particular, how do prosody and the speaker's experience with the relevant state of affairs affect listeners' inferences?

Inferences based on scalar meanings

- Scalar inferences arise from the use of a weaker expression instead of a stronger one (Grice 1969, Horn 1972).
 - (2) **Mike: Was your date hot?**
Julie: He was good-looking. (≈ He was not hot)
- Scalar inferences involve a **degree** of belief in the implicated meaning (i.a. Goodman & Stuhlmüller 2013, Degen 2013)
- Prosody affects scalar inferencing: Presence of pitch accent on *or* or *some* increases extent to which scalar inference is drawn (e.g. Chevallier et al. 2008, Thorward 2009, Zondervan 2010, Schwarz et al. to appear)
- **Empirical short-comings:**
 - Predominant use of written stimuli
 - Only presence/absence of pitch accent investigated

Research question: Is the degree to which a listener believes in the scalar implicature affected by prosodic contour and the speaker's experience?

3. Experiment

2x 2 design – factors in "SW" dialogues like (2):

1. Prosodic contour of the answer (within-subject)

Julie: He was good-looking.

H* **L-L%** [neutral]

L*+H **L-H%** [uncertainty] (e.g. Ward & Hirschberg 1985)

- produced by ToBI-trained speakers
- verified through phonological and phonetic analyses

2. Speaker experience (between-subject)

- **Direct context:** Julie and Mike haven't seen each other in a while. They are catching up over coffee. Mike asks Julie a question about her life, and Julie answers. (E.g. *Was your date hot?*)
- **Non-direct context:** Mike and Julie recently moved to Argentina. Julie often talks on the phone to their friends back home. Mike asks Julie questions about their friends, and Julie answers. (E.g. *Was Sam's date hot?*)

Control stimuli: strong adjective in question, weak adjective in answer ("WS" dialogues, no prosody manipulation)

Was your/Sam's date good-looking? He was hot.

Sample trial: <strenuous, exhausting>, H* L-L%, non-direct experience



Mike: Was Lynn's hike exhausting?
Julie: It was strenuous.
H* L-L%

Does Julie mean that her hike was exhausting?

○ ○ ○ ○ ○ ○ ○

Definitely Perhaps Perhaps Definitely

No No Yes Yes

Mechanical Turk

- 59/57 AmE-speaking participants in direct/non-direct experience conditions
- HIT: 11 dialogues (8 critical, 3 fillers), each participant saw each adjective pair only once
- 9-10 judgments per dialogue

2. Norming experiments

Inclusion criteria: Pairs of adjectives <W(eak), S(trong)> that

1. are interpreted on the same scale ("W, even S" / % "S, even W"; Horn 1972)
2. stand in an entailment relation ("W, but not S" / % "S, but not W").

"W, even S"

Mike: Hugh's mission was risky.
Jake: ... it was even dangerous!

Is Jack's reply to Mike odd?

○ ○

Odd Not odd

"W, but not S"

Hugh's mission was risky, but not dangerous.

Does this sentence sound contradictory to you?

○ ○

Contradictory Not contradictory

Stimuli

- Four stimuli types: "W, but not S", "S, but not W", "W, even S", "S, even W"
- 30 adjective pairs <W, S> for which two native speaker semanticists gave the desired judgments for the 120 critical stimuli

Mechanical Turk: 61 participants, 6-8 judgments per stimulus

Result: For 19 adjective pairs the majority of judgments on all four types of stimuli went in the right direction

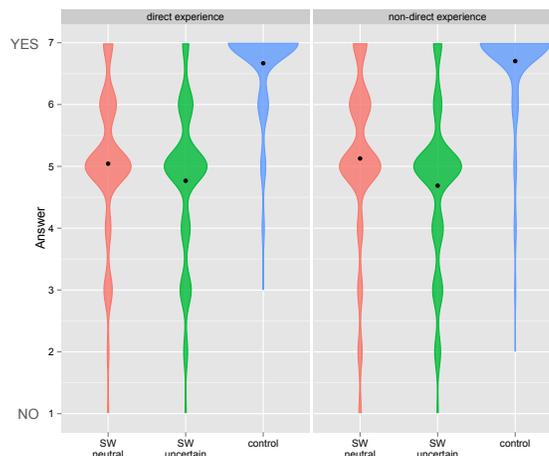
4. Predictions & Results

Predictions

Listeners give more negative responses to answers with uncertainty contour and direct experience (i.e. have a higher degree of belief in the implicature with such answers) than to answers with neutral contour and indirect experience.

Ordinal mixed-effects regression analyses (clmm R ordinal package):

- Adjective strength: WS dialogues receive significantly more negative responses than SW dialogues ($p < .001$)
- Prosodic contour: Dialogues with uncertainty contour receive significantly more negative responses than dialogues with neutral contour ($p < .001$)
- Speaker experience: No effect



5. Discussion

- > The uncertainty contour increases the degree to which the listener believes in the implicature, over the neutral contour.
- > Listeners' calculations of the meanings of indirect answers are sensitive to the prosody of the speakers' utterances.
- > Implications for experiment design:
 - Spoken experiment stimuli control for prosody
 - Our paradigm uses indirect implication judgments (Tonhauser et al. 2013) to probe for scalar implicatures

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