Distinguishing among Contextually-Determined Aspects of Utterance Meaning: An Empirical Investigation

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1. Background: What is said vs. what is implicated

1.1 Grice
- What is said: truth-conditional meaning, including NECESSARY CONTEXTUAL ELEMENTS (NCEs), required for truth-conditional meaning (reference resolution, indexicals, disambiguation, etc).
- What is implicated: includes extra-truth-conditional meaning, i.e., CONVENTIONAL and CONVERSATIONAL IMPLICATURES.
  - GENERALIZED CONVERSATIONAL IMPLICATURES (GCI): elements of meaning that are speaker-intended, context-dependent, cancelable (i.e., denying the implicature will not affect the truth-value of the proposition).
  - Conversational maxims: Quantity, Quality, Relation, Manner

1.2 Neo-Gricean approaches: GCI have been variously classified in the literature.
  Horn: 2 types: Q-based & R-based
  Levinson: 3 types: Q-based, I-based, M-based

1.3 Post-Gricean approaches: GCI INTRUDE on truth-conditional meaning, e.g., EXPLICATURE (Sperber & Wilson 1986, Carston 1988, and Récanati 1989), and IMPLICITURE (Bach 1994).

(1) Irene: Why aren't the guys rehearsing tonight?
   Sam: Robert broke a finger last night.
   (a) There is a finger such that Robert broke it the night prior to the day of utterance.
   (b) Robert broke his own finger the night prior to the day of utterance.
   (c) Robert can't rehearse the night of the utterance.
   Grice/Neo-Griceans: What is implicated = (b) & (c)
   Post-Griceans: What is implicated = (c)

2. Experimental approaches
  Bezuidenhout & Morris 2004: Eye-tracking experiment to test the predictions of Relevance Theory concerning the processing of GCI.
  Gibbs & Moise 1997: Speakers routinely distinguish between what is said and what is implicated for cases of PARTICULARIZED CONVERSATIONAL IMPLICATURES (PCIs), but not for GCI.
  Nicolle & Clark 1999: Failed to reproduce results of Gibbs & Moise (1997) as participants were most likely to select the PCI interpretation for what sentences “say,” “mean,” and “communicate.”

3. Unresolved issues
- Can speakers isolate a level of meaning corresponding to the Gricean notion of what is said that is exclusive of GCI?
- Can we find empirical evidence for the various distinctions among GCI types found in the literature?
- Can we improve upon previous methodologies?
4. Our study

4.1 Methods: Instructions and task. Participants were introduced to the character “Literal Lucy”, who interprets everything literally. As a result, Literal Lucy misinterprets figurative language and indirect speech acts.

4.2 Methods: Stimuli. Short conversations between Irene and Sam, followed by a FACT, which was related to either an entailment, NCE, or GCI associated with an underlined sentence. Participants were instructed to evaluate the truth of the sentence from Literal Lucy’s perspective. This paradigm created an external, shared, objective perspective that participants could use to evaluate the truth-conditional status of GCIs.

(2) Irene: I heard you all went shopping. What did Harry buy?
Sam: Harry bought four books.

FACT: Harry bought five books.

Given this FACT, Literal Lucy would say that the underlined sentence is:

T or F

4.3 Materials. 84 conversations
- 28 entailment controls (14 true, 14 false)
- 16 NCEs, 4 of each type: Lexical disambiguations, pronouns, indexicals, and ellipses
- 40 GCIs, 4 of each type: Scalar quantifiers, scalar adjectives, scalar binary operators, cardinals, comitatives (“do-togethers”), bridging inferences, lexical reduplications (“doublings”), verbal periphrases, conjunction buttressings, argument saturations (“slot fillings”)

4.3.1 GCI types: Based on Levinson’s (2000) categories
- Q-based: scalar quantifiers, scalar adjectives, scalar binary operators, & cardinals
- I-based: comitatives, bridging inferences, conjunction buttressing, & argument saturation
- M-based: lexical reduplications & verbal periphrasis

4.4 Participants. 26 Northwestern University students and community members, 17 female and 9 male, all native speakers of American English. We excluded 3 participants whose scores for either of the control types deviated by at least 2 standard deviations. Materials were presented with blocked randomization using a self-paced reading paradigm.

5. Results and Discussion: Each of the 4 categories (Entailments (True and False), NCEs, and GCIs), was significantly different from the others (p < 0.001). The averages below reflect how often the FACT did not change the truth of the underlined sentence:

<table>
<thead>
<tr>
<th>Entailments: False</th>
<th>1.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCEs</td>
<td>37.3%</td>
</tr>
<tr>
<td>GCIs</td>
<td>60.9%</td>
</tr>
</tbody>
</table>

Entailments: True 91.8%

5.1 NCEs: Both Neo- and Post-Griceans alike agree that truth-conditions are sensitive to NCEs. However, NCEs received a high number of “True” responses. This effect was driven solely by the lexical disambiguations, which were substantially more likely to receive “True” responses than all other NCEs. Excluding lexical disambiguations, NCEs pattern like false entailments. Thus, for our participants, NCEs constitute part of what is said.
5.2 Comparing GCI types: Some GCI types were significantly more likely than others to be judged part of the literal meaning of the underlined sentence.

- 26% Lexical reduplications/“doublings”
- 36% Scalar binary operators
- 47% Cardinals
- 50% Scalar quantifiers
- 59% Bridging inferences
- 61% Verbal reduplications
- 68% Argument saturations/“slot fillings”
- 75% Scalar adjectives
- 75% Conjunction buttressings
- 77% Comitatives/“do-togethers”
- 78% Verbal periphrases

5.2.1 Using Levinson’s (2000) classifications of GCIs, we found significant differences among implicature types:

\[ \begin{align*}
&68\% \text{ I-based} \\
&\star \\
&\star \\
&55\% \text{ Q-based} \approx 60\% \text{ M-based}
\end{align*} \]

\[
\begin{align*}
I &> Q \quad p < 0.02 \\
I &> M \quad p < 0.05
\end{align*}
\]

5.2.2 I-based implicatures: This type forms a coherent group, having scores between 59% and 77%, and cluster more closely than do either Q- or M-based implicatures. As a group, they are more often interpreted as not being part of literal meaning than are other GCI types.

5.2.3 Q-based implicatures: This type does not form a coherent group. There is considerable variation within the class, ranging from 36% to 75%. The salience of alternative set members affects the relative ease with which the relevant implicature can be cancelled.

(3) Hard to cancel = <and, or>
Easy to cancel = <drop-dead gorgeous, pretty>

5.2.4 M-based implicatures: Differences among reduplications: Nominals were harder to cancel than verbals (although trend not reliable).

(4) “I had a salad salad” (FACT: pasta salad) 26%
“He waited and waited” (FACT: 5 minutes) 61%

Differences between reduplications and verbal periphrasis: Reduplications were in general harder to cancel than verbal periphrasis (see appendix). Verbal periphrasis was significantly (p < 0.001) different from nominal reduplications but not verbal ones.

6. General discussion

6.1 Our data do not straightforwardly map onto any of the implicature classifications proposed in the literature, suggesting that these classifications do not reflect the ease with which specific implicature types can be cancelled.

6.2 The least-cancelable GCIs are those based on scales whose members are salient, either intrinsically (closed set) or through explicit evocation.

6.3 Participants appear to treat nominal reduplications as lexical entries with conventionalized meanings -- not as implicatures. They are more like NCEs than GCIs.
References


Appendix: Examples of materials

Entailments

True

(1) Irene: Does Ryan play any sports?
   Sam: He’s on a baseball team.
   FACT: Ryan is the third baseman on an intramural baseball team.

False

(2) Irene: When did Robert’s great-uncle Jake die?
   Sam: He died in 1963.
   FACT: Robert’s great-uncle Jake died in 1957.

NCE: Necessary Contextual Elements

Ellipsis

(3) Irene: What did everyone eat?
   Sam: Robert ate apples, oranges, and pears, and so did Melissa.
   FACT: Melissa ate apples and oranges, but she did not eat any pears.

Indexicals

(4) Irene: When is your nephew’s play?
   Sam: Tonight.
   FACT: Sam’s nephew’s play is at 5:00 p.m. on February 21st, and this conversation took place on February 18th.

Lexical disambiguation

(5) Irene: Why did Cindy go to the drug store yesterday?
   Sam: She broke a nail.
   FACT: Without messing up her manicure, Cindy broke one of the 1/4”-nails she was hammering into the wall while hanging a picture frame.

Pronoun resolution

(6) Irene: I haven’t seen that coat I gave you for Christmas... And what did you do with the sweater I gave you?
   Sam: I hung it in the closet.
   FACT: Sam hung the coat Irene gave him in the closet, and he put the sweater from Irene in his dresser drawer.

Q-based Implicatures

Scalar quantifiers

(7) Irene: What happened at Erin’s birthday party?
   Sam: Her brother, Gus, ate some of the cake.
   FACT: Gus ate all of the birthday cake at Erin’s birthday party before Erin arrived.

Scalar adjectives

(8) Irene: Can you tell me about the new music director?
   Sam: Her name is Ruth. And she’s a competent pianist.
   FACT: Ruth is a highly-acclaimed, world-renowned pianist.

Scalar binary operators

(9) Irene: So what are you going to do with your annual bonus?
   Sam: I’m going to buy a new car or go to Hong Kong.
   FACT: Sam is going to go to Hong Kong and buy a new car with his annual bonus.
Cardinals

(10) Irene: To qualify for a TCP scholarship, you must be a single parent with at least two children. Do you know anyone who fits the bill?
Sam: Well, Seth is a single father and has two kids.
FACT: Seth is a single father with three kids.

I-based Implicatures
Comitatives (do-together)

(11) Irene: Can George and Steve come to the reception this afternoon?
Sam: No. They play squash at the gym until 6:00 every day.
FACT: George plays squash at the YMCA until 6:00 daily, and Steve plays squash at SPAC until 6:00 every day.

Bridging inferences

(12) Irene: How was the wedding?
Sam: The ceremony was nice. I spent the entire evening talking with the maid of honor.
FACT: Sam spent the evening talking to a woman who was the maid of honor in another wedding taking place at the same hotel.

Conjunction buttressing

(13) Irene: So what has your older sister been up to?
Sam: A lot, actually. Last year, she got married and had a baby.
FACT: Sam's older sister gave birth to her only child in January and was married two months later.

Argument saturation: locatives (2) and instrumentals (2)

(14) Irene: Where did John go on vacation this past year?
Sam: He went to Austria last winter and skied.
FACT: Last winter, John went to Austria, and he skied only while he was in Switzerland.

(15) Irene: Have you heard from Mary Ann?
Sam: Just yesterday. She bought a new laptop and sent me a long e-mail.
FACT: Mary Ann bought a laptop but used the library's computer to send Sam the long e-mail.

M-based Implicatures
Lexical reduplications: verbal (2) and nominal (2)

(16) Irene: What happened at Doctor Witherspoon’s office?
Sam: Sasha waited and waited and waited for her appointment.
FACT: Sasha waited 5 minutes for her appointment.

(17) Irene: All I’m having for lunch is potato salad. What are you having?
Sam: I’m having a salad salad.
FACT: Sam is having pasta salad for lunch.

Verbal periphrasis

(18) Irene: How was the choir concert?
Sam: The soloist produced a series of notes that resembled the score of the “Star Spangled Banner”.
FACT: The soloist received a standing ovation for her inspired performance of the “Star Spangled Banner”.