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Irony comprehension: The graded salience hypothesis*

RACHEL GIORA and OFER FEIN

Abstract

The aim of this study is to test the graded salience hypothesis, according to which salient meanings should be processed initially before less salient meanings are activated (Giora, 1997). A meaning of a word or an expression is considered salient if it can be retrieved directly from the lexicon. According to the graded salience hypothesis, processing an utterance such as What a lovely day for a picnic (which has one salient interpretation — the literal) should involve activation of its literal meaning in both types of contexts — in the context biased towards the literal meaning and in the context biased towards the ironic meaning. However, while the ironically biased context should activate the ironic meaning as well, the literally biased context should activate only the literal meaning. In our study, subjects were presented with 'target sentences' (ironies) at the end of either ironically or literally biasing contexts. They were asked to complete one of two fragmented words (such as t_b_e) with the first word that came to mind. The target words were related to either the ironic or the literal meaning of the target sentence, so that activation of the different meanings could be assessed. Findings support the graded salience hypothesis. They show that, contrary to current beliefs, irony interpretation involves processing the literal meaning. They further reveal that ironic and literal interpretations do not involve equivalent processes.

Is irony as easy to understand as nonironic language (as contended by e.g., Gibbs 1986; Gibbs, O'Brien, and Doolittle 1995)? Or does it involve a special (e.g., sequential) process and is therefore more difficult to understand than literal language (as maintained by e.g., Giora 1995 following Grice 1975 and Searle 1979)? Contemporary cognitive psychologists

(e.g., Gibbs 1994; Gibbs and Gerrig 1989; Gildea and Glucksberg 1983; Glucksberg 1989; Glucksberg et al. 1982; Glucksberg and Keysar 1990; Keysar 1989, 1994; Ortony et al. 1978) and linguists (e.g., Sperber and Wilson 1986/95) believe that understanding literal and nonliteral language requires equivalent processes (henceforth the processing equivalence hypothesis). Traditional theorists (e.g., Grice 1975; Searle 1979), however, assume that understanding nonliteral language requires a sequential process, and is more difficult than understanding literal language. In a previous study, Giora (1997) proposed that the equivalent/special process debate can be reconciled if one considers the type of utterance processed. Reviewing and reanalyzing a number of studies on literal and figurative language, Giora showed that meaning salience determines the type of processing invoked. The meaning of a linguistic expression is considered salient in case its interpretation can be directly computed from the lexical meanings automatically associated with entries before any extra inferences based on contextual assumptions have been derived. The graded salience hypothesis thus predicts that salient meanings should be processed initially. Alternative interpretations of similar salience should be processed in parallel, while less salient meanings should be evoked after more salient meanings have been derived.

The purpose of this study is to test the predictions of both the processing equivalence hypothesis and the graded salience hypothesis regarding irony comprehension. According to the processing equivalence hypothesis, the ironic meaning should be activated directly upon processing an utterance in an ironically biased context, without having to process its literal meaning first. Similarly, the literal meaning should be activated directly upon processing an utterance in a literally biased context. In contrast, the graded salience hypothesis predicts that ironic meanings should be activated after their literal meanings have been processed, because ironic interpretations are less salient than their literal meanings. As illustration, consider the following example:

(1) What a lovely day for a picnic.

The literal meaning of the concept 'lovely' can be retrieved directly from the lexicon. However, its ironic meaning cannot. The literal meaning of (1), then, is more salient than its ironic meaning. It should, therefore, be activated initially. According to the graded salience hypothesis, then, the

interpretation of (1) in its ironic meaning (e.g., said on a rainy day) should involve a sequential process: The literal interpretation should be activated prior to the activation of the ironic meaning. In contrast, the interpretation of (1) in a literally biased context (e.g., said on a sunny day) should not. The graded salience hypothesis thus predicts that (1) in its ironic meaning should take longer to read than (1) in its literal meaning. According to the processing equivalence hypothesis, however, (1) should take equally long to read in either (ironically or literally biased) context (e.g., Gibbs 1986). Indeed, in a recent study, Giora et al. (1998) provide evidence in support of the graded salience hypothesis and against the processing equivalence hypothesis. They show that reading an utterance in an ironically biased context takes longer than reading it in a literally biased context. Evidence from reading times and response times then (and see also Giora's [1995] reinterpretation of Gibbs's [1986] findings) are consistent with the hypothesis that irony interpretation involves a sequential process, i.e., activation of the literal meaning prior to the activation of the ironic meaning.

In this paper we intend to provide more evidence in support of the graded salience hypothesis. Particularly we will show that irony comprehension involves activation of the literal meaning, whereas processing the equivalent literal utterance does not involve activation of the ironic meaning. This asymmetry between ironic and literal interpretations will also attest that, contrary to current beliefs, irony and literal interpretations do not involve equivalent processes, since ironic meanings are nonsalient. For how conventional, salient ironies behave, see Giora and Fein (1999b).

The experiment was designed to test understanding of written discourse. To test meaning activation, we used a word fragment completion test. In a word fragment completion test, subjects are asked to complete a fragmented word (e.g., t_b_e) with the first word they can think of. Research in this area has shown that semantic processing during a study phase (like reading behavioral descriptions, reading short stories or poems, category clustering) produces indirect (semantic) priming (e.g., Bassili 1989; Bassili and Smith 1986; Mandler et al. 1990; Overson and Mandler 1987; Richards and French 1991; Whitney et al. 1992, and see discussion in Giora and Fein 1999a).

The aim of this study is to show that, as predicted by the graded salience hypothesis, processing an utterance in an ironically biased context

should involve activating the (incompatible) literal meaning as well as the intended (compatible) ironic meaning. However processing the same utterance in a literally biased context should activate the intended (compatible) literal meaning but not the (incompatible) ironic meaning. Specifically, we expect subjects to be able to complete literally and ironically related words in the ironically biased context condition, but mostly literally related words in the literally biased context condition.

Our subjects were children, aged nine to ten. Previous research has shown that children under this age misunderstand irony (e.g., Winner 1988, and see references therein). However, children as old as nine understand irony to the extent that ironic intonation somehow speeds up irony processing (as is the case with adults), insignificantly though (Rosenblatt et al. 1987, cited in Winner 1988: 155). Conti and Camras (1984) also show that children as old as eight can detect and appreciate irony.

Method

Design

A 2×2 factorial design with discourse type (ironically/literally biased), and word type (ironically/literally related) as within-subject factors.

Subjects

The subjects were sixty 4th graders, nine to ten years old, of a low, middle-class neighborhood, in a satellite town of Tel Aviv. They participated in the experiment as part of their class assignments.

Texts

Twenty Hebrew ironies ('target sentences') were selected for the experiment (see sample items in Appendix). For each target sentence (e.g., *Moshe, I think you should eat something* in [2]), two contexts, a couple of sentences long, were prepared. One comprised an ironically biased context, in which the last clause — the target sentence — had an ironic interpretation (e.g., 2a). The other comprised a literally biased context,

in which the last clause — the target sentence — had a literal interpretation (2b):

(2)

- a. After he had finished eating pizza, falafel, ice-cream, wafers and half of the cream cake his mother had baked for his brother Benjamin's birthday party, Moshe started eating coated peanuts. His mother said to him, "Moshe, I think you should eat something."
- b. At two o'clock in the afternoon, Moshe started doing his homework and getting prepared for his Bible test. When his mother came home from work at eight p.m., Moshe was still seated at his desk, looking pale. His mother said to him, "Moshe, I think you should eat something."

Materials

Two different booklets were prepared. Each contained 20 texts: ten literal and ten ironic context versions for the 20 target sentences, so that each subject read only one (either literal or ironic) type of each target sentence. The texts were ordered randomly within each booklet. They were each printed on a separate sheet of paper. Two incomplete (fragmented) test words were printed on the next page. One test word was related to the literal meaning and the other to the ironic meaning of the target sentence. For instance, example (2) was followed by the (fragmented) test words (which in Hebrew correspond to) *little* (li__le) — related to the literal meaning — and *stop* (s__p) — related to the ironic meaning of the utterance.

Pretesting of materials

Two pretests were performed. The first was aimed to get base line rates. In this pretest, test words were tested for their salience out of context. Twenty five 4th graders of the same school as above, who did not participate in the experiment, participated in this test as part of their class assignments. They were presented with the list of the fragmented words. They were instructed to complete the fragmented words with the first words that came to mind. A word that appeared in more than 20.0 percent of the responses was either replaced or refragmented and retested.

The second pretest was designed to test the effect of the context alone on the activation of the related concepts. In this test, subjects were presented with the contexts without the target sentences. 30 six 4th graders of the same school as above, who did not participate in the experiment, participated in this test as part of their class assignment. They were presented with the same booklets as in the experiment, the only difference being the absence of the last (target) sentence in each text. The subjects were instructed to complete one fragmented word with the first word that came to mind, as in the experiment.

Procedure

Subjects were tested in groups. The two booklets were distributed in a random order. The subjects were instructed to read the text once, rapidly, but in a way that would enable them to understand it. Then, they were to turn over the page. They were not allowed to go back to the text. They were instructed to complete one fragmented word with the first word that came to mind. They were also reassured that we were not concerned with correct spelling, and that in fact there was more than a single correct response. The session took approximately 30 minutes.

Results

For both the experiment and the pretests, the analysis data were the subjects' responses to the fragmented words. The responses were evaluated (by a research assistant) for their relatedness either to the ironic or the literal meaning of the target sentence. A response was classified as ironically or literally-related (and, hence, as either compatible or incompatible with its context) if it was either the intended word or related to one of the contexts. Incomplete responses or responses unrelated to either context were not analyzed.

For the first pretest, the number of correct (either ironically or literally-related) responses obtained for each fragmented word served as base-line rates. A *t*-test performed on the base-line rates obtained revealed no difference between ironically and literally-related words, $t(19) = .271$, $p = .79$, indicating that the fragmented words were similarly salient out of context. However, each base-line rate was subtracted from the number

of correct responses obtained for each (fragmented) word in the experiment. The data we present henceforth thus represent the number of (correct) responses above base-line rates.

The experiment data were submitted to two *t*-tests, one for each context type. The means are presented in Table 1, and illustrated in Figure 1. They show that while in the ironic context there was no significant difference between compatible and incompatible responses $t(19) = 1.22$, $p = .24$, there was a significant difference in the literal context, $t(19) = 5.08$, $p < .0005$.

To rule out the possibility that it is the context rather than the target sentence that affects the pattern revealed by the results, the data from the

Table 1. Mean compatible and incompatible responses to target sentences in ironically and literally biased contexts (SD in parentheses)

Irony comprehension		
text response	ironic	literal
compatible	8.30 (4.78)	10.55 (4.51)
incompatible	6.35 (4.58)	3.65 (2.91)

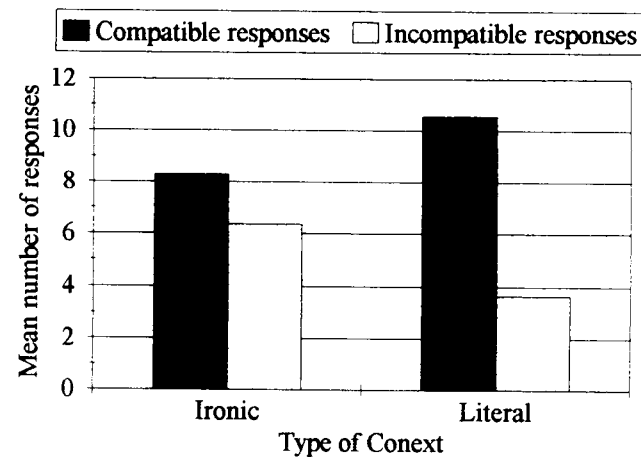


Figure 1. Mean number of compatible and incompatible responses in ironically/literally biased contexts

Table 2. Mean compatible and incompatible responses to ironically and literally biased contexts (SD in parentheses)

Context effect		
text	ironic	literal
response		
compatible	1.30 (1.66)	1.40 (1.88)
incompatible	1.10 (1.48)	0.75 (1.16)

second pretest were submitted to the same analysis as the original data. The means are presented in Table 2. Two *t*-tests, one for each context type, reveal that without the target sentences, there were no significant differences between compatible and incompatible responses, neither for the ironic $t(19)=.43$, $p=.67$, nor for the literal context, $t(19)=1.21$, $p=.24$.

Discussion

Our findings show that comprehension of ironic and literal language involves activation of different concepts. Comprehension of ironic utterances involves activation of both the ironically and literally related concepts. Comprehension of (equivalent) literal utterances involves activation of literally related concepts only. Findings from two pretests rule out the possibility that it is either concept salience out of context, or concept salience as a result of context (without the target sentence) effect per se that account for the results obtained.

General discussion

As predicted by the graded salience hypothesis (Giora 1997), our findings show that understanding ironic language involves activation of both its literal and ironic meanings. These findings dispute the claim prevalent among contemporary linguists and psycholinguists that in processing ironies we do not (have to) process the literal meaning at all (e.g., Gibbs 1986, 1994). Furthermore, contrary to current views (e.g., Gibbs 1986; Sperber and Wilson 1986), these results also suggest that ironies and their literal uses are processed differently. While irony comprehension activates

both the ironic and literal meaning, literal language does not involve activation of the ironic meaning.

Taken together, then, the results obtained here and the different reading times found for irony and literal utterances (Giora et al. 1998, and see also Giora 1995 for a reanalysis of Gibbs's 1986 findings), lend support to the graded salience hypothesis, which predicts that irony comprehension should involve activation of the literal meaning prior to the activation of the ironic meaning.

Our study focuses on understanding written texts. However, recent evidence from conversational irony is also consistent with the graded salience hypothesis. Kotthoff (1999) shows that in dinner conversations among friends, about 36 percent of the responses to ironic turns addressed the explicit, literal meaning, and only 18 percent of the responses addressed the implicated ironic meaning. (The rest were not clearly related to either meaning.) Such linguistic behavior attests to the availability of the literal meaning of irony. Thus, evidence from naturally occurring conversations between friends also lends support to the hypothesis that the salient — literal — meaning of ironic utterances is computed in irony comprehension.¹

Tel Aviv University, Tel Aviv

Appendix

(3)

- a. On Friday, Baruch woke up at quarter to eight, and had to rush off to school. Because he was in such a hurry, he went to school wearing his slippers. When his friend Shimon saw him, he said, "Baruch, what a nice pair of shoes!"
- b. On Thursday, Baruch celebrated his tenth birthday. For his birthday, he got a pair of black sneakers from his uncle Shmuel. The next day, he wore his new shoes to school. When his friend Shimon saw him, he said, "Baruch, what a nice pair of shoes!"

(4)

- a. Dani and Roni are great pals. Because they don't have to go to school on Saturday, they stay up until very late on Friday. Last week they spent their time in the mall, and the weeks before they had gone to see

friends. On Friday afternoon, Dani asked Roni, "Where shall we spend the evening?" Roni thought for a while and said, "It's been long since we went to the movies."

- b. Lily and Galit are great pals. Because they don't have to go to school on Saturday, they stay up until very late on Friday nights. For the last five weeks they have gone to the movies. On Friday afternoon, Lily asked Galit, "How shall we spend the evening?" Galit thought for a while and said, "It's been long since we went to the movies."

Notes

Correspondence address: giorar@post.tau.ac.il

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1. That irony comprehension involves activation of the literal meaning is further supported by some notorious misunderstandings. Consider, for instance, the negative reception of Randy Newman's "Short people" (which began by declaring that "short people got no reason, short people got no reason, short people got no reason to live"). Though Newman explained that he was ironic, this did not affect people's (literal) perception of it. Groups of short people organized a lobby against the song, and it was banned in e.g., Boston and Maryland (Fish 1989).

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