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INFERRING PRAGMATIC MESSAGES FROM METAPHOR

Abstract

When speakers utter metaphors, such as “Lawyers are also sharks,” they often intend to communicate messages beyond those expressed by the metaphorical meaning of these expressions. For instance, in some circumstances, a speaker may state “Lawyers are also sharks” to strengthen a previous speaker’s negative beliefs about lawyers, to add new information about lawyers to listeners to some context, or even to contradict a previous speaker’s positive assertions about lawyers. In each case, speaking metaphorically communicates one of these three social messages that are relevant to the ongoing discourse. At the same time, speaking metaphorically may express other social and affective information that is

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more difficult to convey using non-metaphorical speech, such as “Lawyers are also aggressive.” We report the results of three experiments demonstrating that people infer different pragmatic messages from metaphors in varying social situations and that many metaphors can express additional pragmatic and rhetorical meanings beyond those conveyed by non-metaphorical language. These findings demonstrate the importance of trade-offs between cognitive effort and cognitive effects in pragmatic theories of metaphor use and understanding.

Keywords

Metaphor, pragmatic messages, cognitive effects, psycholinguistics, rhetorical meanings.

1. Inferring pragmatic messages from metaphor

If you heard someone say that “Lawyers are sharks,” what meaning would you infer from the speaker’s statement? Linguistic expressions like “Lawyers are sharks,” exhibiting a “A is B” form, called resemblance metaphors, are typically seen as conveying emergent meanings not captured from a mere combination of the meanings of the A (topic) and B (vehicle) terms. For example, most people interpret “Lawyers are sharks” as expressing a range of impressions about lawyers, including their being highly aggressive, potentially dangerous to those being attacked, and ceaseless in their efforts to attain their goals.

There is a long history of interdisciplinary research examining the precise ways that people come to draw different metaphorical meanings when encountering “A is B” metaphors (Bowdle & Gentner, 2004; Gibbs, 1994, 2008; Glucksberg, 2001). Psycholinguistic studies have demonstrated that the typical meanings people infer from “A is B” metaphors can be shaped by context, and that the cognitive effort required to infer metaphorical meanings may not be any greater than that used in interpreting non-metaphorical statements with similar form and broad meaning (e.g., “Lawyers are aggressive”). The psycholinguistic work on understanding verbal metaphors primarily focuses on the cognitive effort needed to comprehend metaphorical, as opposed to non-metaphorical, meanings. Few empirical studies, however, have investigated how speaker’s pragmatic purposes in using metaphor influences both the process of metaphor understanding and the exact social meanings people infer when they see or hear verbal metaphors.

Consider the following conversational exchange ending with the metaphorical statement “Lawyers are also sharks.”

Tom said to Peter:
“Lawyers support malicious people.”
“They don't care about the victims.”
“They just care about the money”
“Do you have anything to add, Peter?”
Peter replied:
“Lawyers are also sharks.”

Peter's reply to Tom's question does not merely assert a metaphorical meaning about lawyers in terms of sharks; it also conveys social, pragmatic information that Peter agrees with Tom's earlier negative evaluation of lawyers. The metaphor “Lawyers are also sharks” in this context serves to strengthen existing, negative assumptions about lawyers.

Consider now a different exchange between Tom and Peter.

Tom said to Peter:
“Lawyers work in a court”.
“They went to a law school”.
“They specialize in different fields.”
“Do you have anything to add, Peter?”
Peter replied:
“Lawyers are also sharks.”

In this situation, Peter's reply adds something quite new about lawyers, offering a negative opinion of lawyers compared to Tom's earlier non-metaphorical, and neutral, description of lawyers. Listeners presumably do more than just understand Peter's metaphorical statement about lawyers, because they also likely infer that Peter adds new contextual information by saying “Lawyers are also sharks.” Finally, consider one last exchange between Tom and Peter.

Tom said to Peter:
“Lawyers support people in need”.
“They care about their client's troubles.”
“They are not concerned with money.”
“Do you have anything to add, Peter?”
Peter replied:
“Lawyers are also sharks.”

Peter's reply in this context contradicts Tom's earlier positive statements about lawyers. People should not just infer the metaphorical meaning of Peter's assertion, but also recognize that he is contradicting Tom.

In general, these three contexts evoke different readings of “Lawyers are also sharks.” Each of these different meanings is related to the basic metaphorical understanding of the comparison between “lawyers” and “sharks.” But the social messages, or cognitive effects, one draws from reading this metaphorical utterance in the three contexts differ quite a bit. Our claim is that metaphor understanding regularly includes pragmatic messages that depend on listeners’ recognition of speakers’ underlying communicative goals. Thus, different pragmatic messages arise automatically during the course of understanding metaphoric meanings in discourse. Psycholinguists, and others, rarely examine the pragmatic functions of metaphoric language, and our studies were aimed at determining whether, and how easily, people infer pragmatic meanings during online metaphor understanding.

The following experiments investigated people’s speeded reading and interpretations of metaphorical statements in contexts where speakers aim to convey different pragmatic messages by what they say. Psycholinguists and others have referred to these various messages conveyed by different figures of speech as pragmatic goals, social benefits, social functions, discourse goals, pragmatic functions, pragmatic effects, strong and weak implicatures, and cognitive effects (cf. Colston & Katz, 1996; Gibbs & Colston, 2007). Each of these descriptive terms captures something about what speakers and writers sometimes aim to pragmatically achieve through their use of words, and what listeners and readers often infer beyond the figurative meanings of statements. In the present studies, we specifically tested whether people can infer the pragmatic goals of a speaker trying to strengthen an existing assumption, adding new information about a topic, or contradicting an existing assumption through the use of metaphorical language. Our focus on these particular social messages was motivated by relevance theory’s claim that different cognitive effects are fundamental to ostensive inferential communication (Sperber & Wilson, 1995; Wilson & Sperber, 2004). Sperber and Wilson specifically define the presumption of “optimal relevance” (Sperber & Wilson, 1995: 270): “(a) the ostensive stimulus is relevant enough for it to be worth the addressee’s effort to process it;” and “(b) the ostensive stimulus is the most relevant one compatible with the communicator’s abilities and preferences.” One implication of this theory is that there is a trade-off between cognitive effort and cognitive effects such that listeners will attempt to maximize cognitive effects while minimizing cognitive effort. Cognitive effects are achieved when a speaker’s utterance strengthens an existing assumption, adds new information, or contradicts an existing assumption. For the present purposes, we chose to use “social messages” as a catch-all-phrase to emphasize the social nature of what speakers’ strive to accomplish by what they say in discourse.

Experiments 1a and 1b examined whether people inferred different pragmatic messages when reading both metaphors and non-metaphors in the three types of contexts presented above. Experiments 2a and 2b investigated people’s speeded

understanding of metaphors and non-metaphors in the same contexts. Our specific aim here was to demonstrate that reading time measures of metaphor comprehension include people's inferences about the pragmatic functions of speech, and not just their understanding of metaphorical meaning alone (Hamblin & Gibbs, 2003). We were also interested in comparing the effort needed to infer pragmatic messages with metaphors against those derived from non-metaphors. Finally, Experiment 3 explored whether people inferred a broader range of pragmatic and rhetorical messages (e.g., to be persuasive, creative, memorable) when understanding metaphorical expressions, such as "Lawyers are also sharks" compared to interpreting non-metaphorical statements like "Lawyers are also aggressive." This latter study explored the possibility that at least some metaphors have special abilities to readily convey certain rich pragmatic, rhetorical messages compared to non-metaphorical speech.

2. Experiment 1a

Experiment 1a examined whether people could infer different pragmatic messages from metaphorical utterances, specifically strengthening an existing assumption, adding new contextual information, or contradicting an existing assumption. We also investigated whether metaphors that expressed either positive (e.g., "Parents are also diamonds") or negative (e.g., "Marriages are also iceboxes") valence about the topic were equally effective in conveying the three types of pragmatic messages.

2.1 Method

Participants: Twenty-four University of California, Santa Cruz undergraduate students participated in this experiment. They received course credit for their service.

Materials and design: Twenty-four, seven line, scenarios were written that depicted two people speaking to one another about some topic (e.g., teachers, fast food, parents, holidays). These scenarios began with one speaker voicing an opinion about the topic by making three statements. The first speaker then asked the second "Do you have anything to add?" to which the second speaker then replied by uttering a metaphorical utterance. There were three types of context. For strengthening contexts, the first speaker voiced an opinion about some topic, with the second speaker's metaphorical utterance agreeing with, or strengthening the implication of what the first speaker had said. For new contexts, the first speaker made a series of factual statements about some topic, with the second speaker's

metaphorical utterance adding new information beyond what was conveyed by the first speaker. In the contradictory contexts, the first speaker voiced an opinion about some topic, with the second speaker's metaphorical utterance disagreeing or contradicting what was conveyed by the first speaker. Finally, the second speaker's metaphorical utterance was either positive in its valence (e.g., "Parents are also diamonds") or negative (e.g., "Marriages are also iceboxes"). Overall, then, the study incorporated a 3 (types of context) X 2 (types of metaphor) completely within-subjects design.

The experimental materials were divided into three booklets; such that if a specific scenario (e.g. about marriage) ended with the second speaker making a strengthening remark in booklet A, it presented a new remark in booklet B, and a contradictory remark in booklet C. Thus, in each booklet there were eight stories ending with strengthening remarks, eight with new remarks, and eight with contradictory remarks. Each booklet also contained 12 positive metaphors and 12 negative metaphors. Combined with the three types of context, this led to each booklet having four positive strengthening metaphors, four positive new metaphors, four positive contradictory metaphors, four negative strengthening metaphors, four negative new metaphors, and four negative contradictory metaphors.

Following each scenario, ending with the second speaker's metaphor utterance, participants were presented with a series of four statements, to which participants were to rate their degree of agreement using a 7-point rating scale, ranging from 1 meaning "strongly disagree" to 7 meaning "strongly agree." The first statement examined the degree to which the participants believed that speaker's metaphorical utterance indicated that he or she thought positively about the topic (e.g., "Peter thinks positively about marriage"). The second statement examined whether participants believed that the speaker's metaphorical utterance indicated that he/she believed that the first speaker thought positively about the topic (e.g., "Peter thinks that Tom thinks positively about marriage"). The third statement examined whether the participant perceived the second speaker to be trying to convince the first speaker of something about the topic that he/she does not already believe (e.g., "Peter is trying to convince Tom of something about teachers that Tom does not already believe"). The final statement examined whether participants believed that the speaker's metaphorical utterance expressed complex meaning (e.g., "Peter's remark expresses complex meanings").

The entire experiment was completely counterbalanced in the assignment of the different stimuli materials across the three booklets. The orders of stimuli were randomly distributed within each booklet. Table 1 presents all the metaphorical expressions.

Procedure: Participants were randomly assigned to receive one of the three booklets that contained the instructions and all experimental materials. The

instructions read: “This experiment examines your interpretation of speakers’ utterances in different contexts. You will be reading a series of stories, each of which ends in someone saying something, followed by a series of statements regarding YOUR interpretation of what that speaker had meant to communicate. Your task is to closely read each story context, and the final utterance. You are to then give your ratings of agreement with each of the four statements that follow. You are to give your ratings of agreement along a 7-point scale, where 1 indicates ‘No, I don’t agree with this statement’ and 7 indicates ‘Yes, I very much agree with this statement.’ You are encouraged to use all portions of the rating scale, so that in some cases you may sort of agree with one of the statements, in which case you could give a 3, 4, or 5 rating.” Participants then read and gave their agreement ratings to the different questions for two practice stories. When they completed this, and had no questions about their task, they then began the experiment, which took about 25 minutes to finish.

2.2 Results and discussion

The mean ratings for each statement were computed for the three types of context and the two types of metaphor. These mean ratings are presented in Table 2. Recall that the higher the rating, the more participants agreed with the statement.

Separate 2 X 3 analyses of variance were conducted on the data for each statement. These were performed twice, once where participants was the random variable (F1), and once where the stimulus items were the random variable (F2).

For statement 1 (i.e., the speaker thinks positively about the topic) participants agreed significantly more that the speaker was thinking positively about the topic given positive metaphors than negative ones, $F(1, 23) = 14.67$, $p < .001$; $F(1, 23) = 8.05$, $p < .05$. The main effect of context and the interaction between type of metaphor and type of context were not reliable, all F s < 1 . Further examination of the individual cell means using protected t-tests revealed, not surprisingly, that people gave higher ratings for the positive metaphors than for the negative ones in each of the three types of contexts, $p < .01$ for each comparison respectively. The results for the first statement generally indicate that people were sensitive to whether the metaphor utterance in each story was intended to convey something positive or negative about the topic.

For statement 2 (i.e., the speaker believes that the addressee thinks positively about the topic), the main effects of type of metaphor and type of context were not statistically significant, both F s < 1 . However, the interaction of these two variables was highly significant, $F(2, 23) = 21.55$, $p < .001$; $F(2, 23) = 15.31$, $p < .001$. Examination of the individual cell means showed that participants agreed more that the positive metaphors indicated that the speaker thought that the addressee (i.e.,

the first speaker) thought positively about the topic in the strengthening context, $p < .01$, with the reverse happening in the contradictory contexts, $p < .01$. The agreement ratings did not differ for the positive and negative metaphors in the new contexts. This pattern of findings generally showed that people read the metaphors as being appropriately strengthening or contradictory of some assumption depending on whether the metaphor is positive or negative.

For statement 3 (i.e., the speaker was trying to convince the addressee of something the addressee did not already believe), the effect of metaphor type was not reliable, both $F_s < 1$; but there was a significant main effect of context, $F(2, 23) = 15.02$, $p < .001$; $F(2, 23) = 17.81$, $p < .001$; and the interaction between metaphor and context was reliable, $F(2, 23) = 12.43$, $p < .01$; $F(2, 23) = 7.54$, $p < .01$. Further analysis of the individual means indicated that participants thought the positive metaphors tried to convince the addressee of something he/she did not already believe more so than was the case for the negative metaphors in the strengthening contexts, $p < .05$, with the reverse happening in the new contexts (although this difference was only marginally reliable, $p < .10$). The difference between the two types of metaphor in the contradictory contexts was not close to being significant. Thus, the participants saw both the positive and negative metaphors as trying to convince the addressee of something he did not presently believe when these are presented in contradictory context. But overall, people recognize that the metaphors clearly contradicted the addressee in the contradictory contexts.

Finally, for statement 4, participants saw the positive metaphors as expressing more complex meaning only marginally more than they did for the negative metaphors, $F(1, 23) = 3.80$, $p < .10$; $F(1, 23) < 1$. The main effect of context type was not significant, nor was the interaction of between metaphor type and context statistically reliable, both $F_s < 1$. None of the specific comparisons between the positive and negative metaphors for the three types of context were significant.

In general, the results of this study demonstrated that people understand not only the rough metaphorical meanings of the final statements, but also that these convey additional pragmatic implications that differed in the three contexts.

3. Experiment 1b

The aim of Experiment 1b was to see if people draw the same kinds of social messages when understanding non-metaphorical paraphrases of the metaphorical comparisons used in the first study. It is virtually impossible to simply paraphrase metaphorical statements, such as "Lawyers are also sharks," in non-metaphorical terms, especially using single word substitutions. For this reason, we do not maintain that the non-metaphorical statements (e.g., "Lawyers are also

aggressive”) studied in Experiment 1b are equivalent in meaning to the final metaphoric statements examined in Experiment 1a. Various empirical studies have shown that non-metaphorical paraphrases of metaphors are rarely as apt or informative as the original metaphors (Gibbs, 1994). Yet it is still useful to see if people have a greater tendency to draw certain social messages when encountering non-metaphorical speech of similar length in different contexts than what was observed with metaphorical utterances in the first study. Finally, we resist calling non-metaphorical paraphrases “literal” statements, precisely because there are many kinds of non-metaphorical meaning (e.g., metonymic, ironic, oxymoronic) that scholars would not characterize as being literal. Given the long-noted difficulties in defining “literal” meaning (Gibbs, 1994, 2002), we simply refer to the paraphrases employed as final statements in Experiment 1b as conveying “non-metaphorical” meaning. Our general expectation was that people would draw the same types of social messages for the non-metaphorical statements as for the metaphoric ones shown earlier.

We also note the problematic nature of determining “paraphrases” for the metaphoric statements, given the well-accepted difficulty of adequately, and simply, stating what a metaphor means, both in terms of its semantic meaning and the pragmatic message it can convey. However, there is also a long history in psycholinguistics of experimental work comparing people’s processing and consciously held interpretations of different figurative utterances compared to non-figurative alternatives. This work is useful for exploring what is possibly unique about figurative language use, and, what pragmatic messages people can infer when understanding, in this case, metaphoric expressions.

3.1 Method

Participants: Twenty-four undergraduate students from the University of California, Santa Cruz participated to fulfill a course requirement. These subjects did not participate in the first study.

Materials and Design: The three types of contexts used in Experiment 1a were also employed in this study. However, the final statements in the present study were simple non-metaphorical paraphrases of the final metaphorical remarks used in Experiment 1a. We created these non-metaphorical paraphrases by substituting the vehicle term of each metaphor (e.g., “shark”) with an adjective that conveys a general sense of the metaphorical meaning in a non-metaphorical way (e.g., “aggressive”). Table 1 also provides a list of the non-metaphorical final statements employed in Experiment 1b.

Procedure: The procedure was identical to that used in Experiment 1a.

3.2 Results and discussion

The mean ratings for each statement were computed for the three types of context and the two types of non-metaphor (i.e., positive vs. negative). These mean ratings are presented in Table 3. Once again, the higher the rating, the more participants agreed with the statement.

For statement 1, participants agreed that the speaker was thinking positively about the topic given positive non-metaphors than negative ones, $F(1, 23) = 10.58$, $p < .001$; $F(2, 23) = 11.34$, $p < .001$. The main effect of context and the interaction between type of non-metaphor and type of context were not reliable, all F s < 1 . Protected t-tests demonstrated that people gave higher ratings for the positive non-metaphors than for the negative ones in each of the three types of contexts, $p < .01$ for each comparison respectively. Overall, people were sensitive to whether the non-metaphoric utterance in each story conveyed something positive or negative about the topic.

For statement 2, the main effects of type of non-metaphor and type of context were not significant, all F s < 1 , but that the interaction of these two variables was highly significant, $F(2, 23) = 26.04$, $p < .001$; $F(2, 23) = 9.44$, $p < .01$. Protected t-tests showed that participants recognized that speakers thought that addressees (i.e., the first speaker) had positive opinions about the topic in the strengthening context, $p < .01$, with the reverse happening in the contradictory contexts, $p < .01$. The difference between the positive and negative non-metaphors in the new contexts was marginally reliable, $p > .10$. This pattern of findings generally show that people understood the non-metaphors as being appropriately strengthening or contradictory of some assumption depending on whether the statement was positive or negative.

For statement 3, the effect of non-metaphor type (i.e., positive or negative) was not reliable, $F < 1$, but there was a significant main effect of context, $F(2, 23) = 11.60$, $p < .001$; $F(2, 23) = 10.90$, $p < .01$, and the interaction between type of non-metaphor and context was reliable, $F(12, 23) = 9.87$, $p < .01$; $F(2, 23) = 5.33$, $p < .05$. Further analysis of the individual means indicated that in the strengthening contexts participants thought the positive non-metaphors were aimed to convince the addressee of something he/she did not already believe more so than was the case for the negative non-metaphors, $p < .05$, with the reverse happening in the new contexts, $p < .05$. Overall, the participants interpreted both the positive and negative non-metaphors as trying to convince addressees of something they doesn't already believe when these are presented in contradictory context.

Finally, the findings for statement 4 did not reveal any significant differences in complexity for the positive and negative non-metaphors across the three contexts.

In general, Experiment 1b revealed that the pragmatic messages associated with understanding non-metaphors roughly mirrors those associated with interpreting

metaphors, at least in terms of the three main pragmatic effects of strengthening, adding new information, and contradicting existing assumptions. Non-metaphors do not appear to offer any advantage over metaphorical expressions of the “A is B” form in conveying significant social messages.

4. Experiment 2a

Do people require more cognitive effort when interpreting metaphors that convey certain pragmatic messages as opposed to others? Previous studies looking at speeded comprehension of metaphor, and other forms of figurative language, typically assess the effort associated with understanding figurative meaning alone, without considering how the pragmatic impact of messages influences processing time for a metaphorical expression. Our aim in Experiment 2a was to explore comprehension for A is B metaphors in contexts that convey different pragmatic goals. We predicted that people would take more time to understand metaphors in contradictory contexts than in either the strengthening or adding new information situations, because of the additional effort needed to reconcile the final speaker’s belief with what was stated earlier.

4.1 Method

Participants: Thirty-six UCSC undergraduate students participated in this study to satisfy a course requirement.

Materials and design: The same basic conversational exchanges used in Experiment 1a ending in one of the three types of metaphorical expressions were employed as the stimuli in this study. In addition, another 24 filler stories were created that ended with non-metaphorical statements. The 48 stories were distributed in a counterbalanced manner across three sets of materials with different participants being randomly assigned to read one set of these during the experiment. The presentation of all materials for each set was randomly determined for each participant. There were also three story conversations created, two ending with metaphors and one with a non-metaphor, which were used in a short practice session before the start of the main experiment.

Procedure: Each participant was seated at a computer terminal and told that he or she would be reading a series of stories involving conversational exchanges between two people. Participants were told to read each line of the story, presented one at a time on the computer screen, and to push the space bar to see the next line. The instructions emphasized that participants should read each line as quickly as possible, pushing the button as soon as they had finished, but to understand what

each statement expressed, before making their comprehension responses. Participants were also told that they would be asked several questions about their understandings of the stories after completion of this part of the experiment. After receiving the instructions, the participants went through a brief practice session involving three stories to insure that they understood their task. The entire task took approximately 15 to 20 minutes to complete.

4.2 Results and discussion

The mean reading times for the positive and negative metaphors in the three different contexts is presented in Table 4. Analyses of variance on these results indicated a significant effect of context, $F(2, 35) = 21.30$, $p < .001$; $F(2, 35) = 8.45$, $p < .01$, and a significant interaction between type of context and type of metaphor, $F(2, 35) = 8.93$, $p < .01$; $F(2, 35) = 4.55$, $p < .01$. Further analyses of the individual cell means showed that people took more time to read both the positive and negative metaphors in contradictory contexts than in either the strengthening or new contexts ($p < .05$ for each comparison). Furthermore, people took more time to read positive metaphors than negative ones in contradictory contexts, $p < .01$. No other comparisons were statistically reliable.

These findings demonstrate that metaphorically asserting the opposite of what was just previously uttered takes readers more time to comprehend than if the metaphor merely strengthened an existing belief or added some new information that was still consistent with the ongoing discourse. But people find contradictory metaphors easier to process when these statements assert something negative about the topic (e.g., marriage) than when these expressions make a positive comment. The presence of a negative vehicle term (e.g., “sharks”) in the context of a previous speaker’s positive comments about a topic appears to quickly alert people to speaker’s contradictory messages.

5. Experiment 2b

A long-standing topic of debate in the psycholinguistic literature is whether metaphoric language is more difficult to process than non-metaphorical speech. Quite generally, empirical research shows that people need not take longer to process many forms of figurative speech, including novel metaphors, than to comprehend the same utterances in non-metaphorical contexts or roughly equivalent non-metaphorical utterances (Gibbs, 1994; 2002). Of course, people can at times put considerable effort into interpreting some novel figurative expressions,

but people do not always find metaphoric language more difficult to comprehend because it is non-literal.

Our concern in Experiment 2b, however, was to compare speeded comprehension of metaphors conveying different social messages in varying contexts from non-metaphoric utterances that roughly aim to convey the same broad social messages (e.g., contradicting a previous speaker's assumptions). Experiment 2b aimed to replicate the previous study, this time using non-metaphorical utterances that were employed in Experiment 1b.

First, we expected people to take more time to comprehend non-metaphorical utterances in contradictory contexts than in either the strengthening or new information contexts. Second, we compared the results from Experiments 2a and 2b to see if people devoted more time to processing metaphorical expressions than non-metaphorical ones. One possibility is that metaphor may take more time to process because they elicit greater pragmatic meanings than do non-metaphorical expressions. For example, under relevance theory, people follow a trade-off of aiming to maximize cognitive effects while minimizing cognitive effort. Thus, people may spend more time processing some metaphors because they can infer greater, often subtle, pragmatic and rhetorical meanings while reading these expressions, at least compared to reading non-metaphorical statements.

5.1 Method

Participants: Thirty six undergraduate students, who had not served in any previous experiment, participated in Experiment 2b.

Materials, design, and procedure: The materials, design, and procedure for this study were identical to that used in Experiment 2a, this time, however, each story ended with a speaker making a non-metaphorical statement rather than a literal one. The final non-metaphorical statements were identical to those employed in Experiment 1b.

5.2 Results and discussion

The mean reading times for the positive and negative non-metaphors in the three different contexts is presented in Table 7. Analyses of variance showed a significant effect of context, $F(2, 35) = 9.89$, $p < .001$; $F(2, 35) = 13.60$, $p < .01$, and a significant interaction between context and metaphor valence, $F(2, 35) = 11.50$, $p < .01$; $F(2, 35) = 9.05$, $p < .01$. Examination of the individual cell means indicated that people read both the positive and negative metaphors in contradictory contexts more slowly than in either the strengthening or new contexts

($p < .05$ for each comparison). People also took more time to read positive metaphors than negative ones in contradictory contexts, $p < .01$.

This overall pattern of results on speeded interpretations of non-metaphors parallels those found in Experiment 2a with metaphorical expressions. However, a further analysis of the cells means across the two experiments showed that people took longer to read the metaphors in each condition (Experiment 2a) than they did the non-metaphors in the corresponding conditions (the present study), each comparison $p < .05$ using two-tailed protected t-tests. The extra time needed to comprehend the metaphors may be due to several factors. One hypothesis stems from the traditional belief that people must always analyze the complete semantic, literal meanings of utterances before accessing pragmatic and social knowledge to infer context-appropriate, figurative meaning. But many different empirical findings contradict this hypothesis (Gibbs, 1994, 2002). A related possibility is that the metaphorical expressions took additional effort to process because people must resolve the semantic incongruity or contradiction between the different topic and vehicle terms (e.g., marriages and iceboxes). But people appear to understand, and appreciate, significant aspects of the speaker's attitude toward a topic by simply noting the contradictions in some metaphors without necessarily resolving these incongruities by determining the underlying similarities between the source and target domains (Bernsten & Kennedy, 1996).

The main idea explored in Experiment 3, however, was that metaphors, under some circumstances may afford additional pragmatic and rhetorical effects over that conveyed by non-metaphorical paraphrase expressions. An earlier study demonstrated that there were additional costs associated with processing of referential metaphors (e.g. "All toads to the side of the pool") and synonymous literal expressions (e.g. "All children to the side of the pool") in neutral contexts (Noveck, Bianco & Castry, 2001). This finding was used to argue that there are additional benefits arising from the extra processing of metaphors, although Noveck et al. did not explicitly demonstrate this. Additional processing effort put into understanding any linguistic utterance does not automatically imply that additional cognitive effects will be realized (Gibbs & Tendahl, 2006). Still, there are implicit motivations for speakers' employing metaphors in some context, some of which may indeed be related to metaphor's special ability to effectively communicate a range of pragmatic messages.

6. Experiment 3

Our aim in Experiment 3 was to see if readers have different intuitions about the pragmatic and rhetorical messages conveyed by metaphors compared to non-metaphors. The previous studies clearly indicate that both metaphors and non-

metaphors can evoke similar pragmatic messages in regard to strengthening, adding, and contradicting earlier discourse assumptions. However, we now examined the possibility that people inferred greater degrees of pragmatic information when reading the metaphors that may be more subtle than the three pragmatic messages examined in Experiments 1 and 2.

The most comprehensive way of describing the sorts of pragmatic, rhetorical effects that people may draw when understanding metaphors, or any kind of linguistic expression, is in terms of “weak implicatures.” These meaningful inferences are the listeners’/readers’ responsibility and do not necessarily reflect what a speaker/writer had in mind or intended to communicate. Listing the possible inferences readers may generate does not imply that these meanings are numerable or clearly differentiated. But listeners will still experience some understanding of possible weak implicatures by widely searching their knowledge of certain concepts (e.g., lawyers), as well as their knowledge of specific speakers, genres, and social situations. Weak implicatures are manifest to the extent that a person in some discourse situation provides sufficient evidence for its adoption (Sperber & Wilson, 1995).

Experiment 3 tested the idea that people infer a greater degree of pragmatic effects or weak implicatures by having participants read metaphors and non-metaphors in the three different contexts studied earlier. At the end of each context, participants rated the degree to which the last line of each conversational exchange (i.e., a metaphor or non-metaphor) were seen as memorable, creative, provocative, concise, dramatic, emotive, meaningful and persuasive. These eight dimensions included features that scholars from different disciplines have at one time or another speculated are special to metaphor (e.g., Gibbs & Colston, in press).. Although non-metaphoric language can certainly, in some forms and in some contexts, also convey similar pragmatic and rhetorical effects, our expectation was that people should generally give higher ratings on these dimensions having read the metaphors than the non-metaphors. We also expected these effects to be more pronounced when people read metaphors in the contradictory contexts than in either the strengthening or new contexts. Finally, we also expected that negative metaphors would evoke a greater degree of pragmatic information than would positive metaphors, primarily because of the affective impact that speaking negatively about some topic has in discourse (Witte, 1992).

6.1 Methods

Participants: Forty-two UCSC undergraduate students participated in this study to satisfy a course requirement.

Material and design: The same stories and final statements (i.e., metaphors and non-metaphors) employed in the previous experiments were used in this study, but participants saw both metaphors and non-metaphors. The experimental materials were divided into six counterbalanced booklets; such that if a specific scenario (e.g. about marriage) ended with the second speaker making a strengthening remark in booklet A, it presented a new remark in booklet B, and a contradictory remark in booklet C. Thus, in each booklet there were eight stories ending with strengthening remarks, eight with new remarks, and eight with contradictory remarks. While booklets A, B, and C contained metaphoric final remarks for a particular scenario, booklets D, E, and F contained non-metaphoric final statements for that same scenario. At the same time, $\frac{1}{2}$ of the final utterances in each booklet were metaphoric and $\frac{1}{2}$ non-metaphoric, with each of these types of final statements being positive $\frac{1}{2}$ of the time and negative $\frac{1}{2}$ of the time.

Following each story, participants saw a list of eight statements that referred to different possible social effects that the speaker may have wished to communicate by his or her final utterance. These eight statements stated that the speaker intended to be his or her final utterance to be memorable, creative, provocative, concise, dramatic, emotive, meaningful and persuasive (in that order).

Procedure: Participants were instructed to read each story in the booklet presented to them, and to then give a rating on their own interpretation of what the speaker intended to communicate by the final utterance for each of the eight dimensions listed below each story. They gave their ratings of agreement along a 7-point scale, where a 1 indicates, “No, I don’t agree with this statement” and a 7 indicates, “Yes, I very much agree with this statement.” Participants were encouraged to use all portions of the rating scale in making their judgments about what speakers intended to communicate. The task took approximately 20 minutes to complete.

6.2 Results and discussion

Participants’ ratings for each of the eight dimensions are presented in Tables 5 (the positive statements) and Table 6 (the negative statements). The participants’ ratings were first analyzed according to an omnibus 2 (final sentence: metaphor vs. non-metaphor) x 2 (valence: positive vs. negative) x 3 (context: strengthening vs. new vs. contradictory) x 8 (social effects) analysis of variance. This analysis first revealed that people generally gave higher ratings to the metaphors than to the non-metaphors, $F(1, 40) = 79.43$, $p < .001$, and that people gave higher ratings to negative statements than to positive ones $F(1, 40) = 9.66$, $p < .01$. Furthermore, people gave different ratings to the statements in the three types of context, $F(2,$

39)= 16.87, $p < .001$, and also differentially rated the eight different social effects, $F(7, 311) = 7.79$, $p < .001$.

There were also several significant interactions, including between valence and social effects, $F(7, 34) = 11.92$, $p < .001$; final sentence and social effects, $F(7, 34) = 30.12$, $p < .001$; and between context and social effects, $F(14, 27) = 3.47$, $p < .01$.

Additional analyses on the ratings for the three different context types showed that people gave significantly higher ratings to statements in the contradictory contexts, followed by the strengthening, and then the new contexts ($p < .05$ for each pairwise comparison). Using either metaphors or non-metaphors in contradictory contexts evokes a more complex set of pragmatic effects compared to when speakers try to strengthen some existing contextual assumption or add a new contextual idea to the ongoing discourse. These findings are consistent with our general predictions about the kinds of pragmatic messages associated with contradictory messages.

The most important analysis that we wish to focus on concerns the differences between reading the metaphors and non-metaphors in the three contexts. Note that the number of comparisons made overall demanded that a higher value of p be used to assess statistical significance in this study. Tables 5 and 6 present the appropriate p value associated with each of the comparisons discussed below.

First, in the strengthening and new contexts people rated both the positive and negative metaphors to be more memorable than the positive and negative non-metaphors. Second, people rated both positive and negative metaphors to be more creative than both types of non-metaphors in all three contexts. Third, participants viewed both types of metaphor to be more persuasive than both types of non-metaphor in the strengthening contexts, they saw the positive metaphors to be more persuasive than the non-metaphors in the new contexts, and found the negative metaphors to be more persuasive than the non-metaphors in the contradictory contexts. Fourth, none of the comparisons between the metaphors and non-metaphors were significant for the conciseness ratings. Fifth, people found both positive and negative metaphors to be significantly more dramatic than they did both types of non-metaphors across all three contexts. Sixth, although positive metaphors were not more emotive than the positive non-metaphors in any context, people did find negative metaphors to be more emotive than negative non-metaphors in the new and contradictory contexts. Seventh, participants rated the positive non-metaphors to be more meaningful than the metaphors in the contradictory contexts, but no other comparisons for meaningfulness were significant. Finally, people did not view the metaphors to be more significantly more persuasive than the non-metaphors in any context.

Overall, of the 48 possible comparisons between metaphors and non-metaphors in Experiment 3, metaphors were seen as affording greater pragmatic messages in 22 of these, with 19 others showing an advantage for metaphors that were not

statistically significant given the conservative levels of alpha used to control for Type 1 error. Only 1 of the 48 comparisons indicated higher ratings for non-metaphors over metaphors, while 6 others showed non-significant advantages for the non-metaphors. These results are consistent with general claims that metaphorical language, at least of the A is B forms studied in these experiments, can communicate greater pragmatic messages than does roughly corresponding non-metaphorical speech.

7. General discussion

Our studies are the first to experimentally demonstrate that both metaphors and non-metaphors express pragmatic meanings that reflect speakers' communicative goals, such as to strengthen an existing assumption, add new information, or contradict an existing discourse assumption. The important implication of this set of findings for theories of metaphor, and metaphor comprehension, is that people do more than seek to communicate and understand metaphorical meanings, but use metaphorical language to convey broader pragmatic messages. Metaphoric meanings are not understood as conversational implicatures, but various pragmatic effects may be drawn when metaphors are interpreted in context. Despite the fact that numerous reading time studies have been published on metaphoric, and other types of figurative, language understanding, this body of research has not properly explored how the pragmatic messages speakers aim to communicate beyond metaphorical meanings influence the latencies to comprehend metaphoric utterances in discourse. Our findings from Experiments 2a and 2b directly show that the pragmatic aims of metaphoric language in context affect the overall effort needed to interpret metaphors.

Experiment 3 revealed that reading certain metaphorical statements, especially those referring to negative topics, encourages a greater range of pragmatic messages than reading non-metaphorical expressions. Considering the results from Experiments 1 and 2, people may often take more time to process certain "A is B" expressions, but there are important pragmatic, communicative benefits that accompany the additional effort needed to understand metaphors compared to non-metaphors. We do not maintain that metaphors always take longer to process than non-metaphors, or that all metaphors always convey additional pragmatic effects over those afforded by non-metaphors. Yet it is clear that at least in some cases people are rewarded with the additional effort they put into understanding metaphors by appreciating a broader range of pragmatic effects. Of course, Experiment 3 only examined eight possible pragmatic effects that people may infer when understanding metaphorical and non-metaphorical speech. There certainly may be other social, affective, and poetic effects that some metaphors convey that

were not examined. At the same time, there may be certain social and affective messages that literal speech may better convey over metaphor. Nonetheless, people appear to put more effort in understanding the metaphors in our studies because they got something from the experience that made it worthwhile.

We do not know the exact manner in which metaphorical meanings and pragmatic messages are understood when people read metaphors in discourse (Tendahl, 2009; Tendahl & Gibbs, 2008). One possibility is that people create a full understanding of the metaphor, and from this derive pragmatic messages that may be directly relevant to the context. But we doubt whether the comprehension process works in this linear way. It is never clear what the “full” meaning of a metaphor, or really any linguistic utterance, may be apart from the context in which it appears. Many metaphors are notoriously “pregnant” with meaning and are capable of evoking a rich set of propositional and non-propositional meanings, depending on the amount of effort a reader or listener puts into interpreting any metaphor in some specific circumstance (e.g., hearing a metaphor in fast conversation vs. reading a literary metaphor at leisure).

Moreover, the task of understanding metaphors in discourse typically involves, as relevance theory argues, trying to maximize the cognitive effects associated with an utterance in context while minimizing the cognitive effort put into deriving these effects. Under this view, for example, people reading or hearing a metaphor such as “Lawyers are also sharks” may quickly infer certain metaphorical meanings and then understand that the speaker also wishes to, say, contradict what another person has just asserted, which in turn immediately constrains further metaphorical interpretations of what was implied by the speaker’s utterance. At some point, the interpretations drawn from the metaphor in context will become more effortful to derive and so processing will cease given that expectations of optimal relevance have been satisfied. The important claim here is that there is likely to be significant interaction between the metaphorical meanings and the pragmatic messages inferred in any instance of online metaphor understanding so that it makes little sense to say that one kind of meaning (i.e., metaphorical) necessarily is completely comprehended before another (i.e., specific pragmatic messages) are understood. But more generally, how long one “processes” a metaphor is not simply a matter of complexity of metaphorical meaning per se, but often related to deriving important pragmatic messages that metaphors may sometimes be especially effective at evoking.

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Appendix

Table 1. Metaphorical and non-metaphorical statements

<i>Positive metaphors (and non-metaphors)</i>	<i>Negative metaphors</i>
<p>Friends are also flowers. (wonderful)</p> <p>A promotion is also a home-run. (an advance)</p> <p>French food is also a symphony. (artistic)</p> <p>Weddings are also sunshine. (beautiful)</p> <p>Diplomas are also money. (valuable)</p> <p>Cars are also gold. (efficient)</p> <p>Parents are also diamonds. (encouraging)</p> <p>Pets are also babies. (innocent)</p> <p>Operas are also feasts. (inspiring)</p> <p>A conference is also a party. (enjoyable)</p> <p>Lifeguards are also angels. (brave)</p> <p>Holidays are also a breath of fresh air. (invigorating)</p>	<p>Marriages are also iceboxes (combative)</p> <p>Congress is a also zoo (unruly)</p> <p>Cigarettes are also time bombs. (dangerous)</p> <p>Arizona is also an oven (hot)</p> <p>The Government is also a thief. (wasteful)</p> <p>Desks are also junkyards (cluttered)</p> <p>Jobs are also jails (confining)</p> <p>Salesmen are also bulldozers (persistent)</p> <p>Shirts are also tents (disguising)</p> <p>Lawyers are also sharks (aggressive)</p> <p>Surgeons are also butchers (sloppy)</p> <p>Fast food is also poison (unhealthy)</p>

Table 2. Mean ratings for metaphors (Experiment 1a)

Statement 1- Speaker thinks positively about the topic.

Context	Metaphor positive	Metaphor negative
Strengthening	5.75	2.51
New	5.67	2.39
Contradictory	5.90	2.05

Statement 2- Speaker thinks addressee thinks positively about X

Strengthening	5.90	2.44
New	4.75	4.23
Contradictory	2.22	5.67

*Statement 3- Speaker is trying to convince address about something addressee
 does not
 already believe*

Strengthening	3.22	2.34
New	3.67	4.34
Contradictory	5.60	5.44

Statement 4- Speaker's remark expresses complex meanings

Strengthening	4.22	3.81
New	4.31	4.23
Contradictory	4.84	4.46

Table 3. Mean ratings for non-metaphors (Experiment 1b)

Statement 1- Speaker thinks positively about the topic.

Context	Non-Metaphor Positive	Non-Metaphor Negative
Strengthening	5.45	2.80
New	5.21	2.62
Contradictory	6.03	2.21

Statement 2- Speaker thinks addressee thinks positively about X

Strengthening	5.76	2.70
New	4.58	3.89
Contradictory	2.40	5.43

Statement 3- Speaker is trying to convince address about something addressee does not already believe

Strengthening	3.03	2.54
New	3.61	4.69
Contradictory	5.31	5.29

Statement 4- Speaker's remark expresses complex meanings

Strengthening	3.80	3.72
New	4.18	4.44
Contradictory	4.62	4.29

Table 4. Mean reading times (milliseconds) for metaphors (Experiment 2a)

	Metaphor positive	Metaphor negative
Strengthening	1726	1741
New	1701	1716
Contradictory	1999	1878

Table 5. Mean reading times (milliseconds) for non-metaphors (Experiment 2b)

	Non-Metaphor Positive	Non-Metaphor Negative
Strengthening	1434	1554
New	1450	1387
Contradictory	1287	1537

Table 6. Mean ratings of agreement for positive metaphors and non-metaphors (Experiment 3)

Items	Strengthening context			New context			Contrasting context		
	Metaphor	Non-metaphor	P	Metaphor	Non-metaphor	P	Metaphor	Non-metaphor	P
Memorable	4.70	3.43	.000*	4.95	3.58	.000*	5.05	4.38	.007
Creative	4.92	2.73	.000*	4.94	2.90	.000*	5.10	3.15	.000*
Provocative	4.29	3.05	.000*	4.58	3.39	.000*	4.77	4.15	.006
Concise	4.33	4.80	.037	4.44	4.74	.252	4.54	4.98	.058
Dramatic	4.20	2.73	.000*	4.00	2.86	.000*	4.33	3.42	.000*
Emotive	3.86	3.27	.062	3.51	3.46	.850	3.96	3.58	.104
Meaningful	4.13	3.65	.064	4.40	3.90	.083	4.38	4.57	.001*
Persuasive	3.44	3.23	.418	3.36	3.05	.235	3.70	3.94	.332

Note: Type I error controlled for with Bonferoni adjustment, * indicates that $\alpha < .002$

Table 7. Mean ratings of agreement for negative metaphors and non-metaphors (Experiment 3)

Items	Strengthening context			New context			Contrasting context		
	Metaphor	Non-metaphor	P	Metaphor	Non-metaphor	P	Metaphor	Non-metaphor	P
Memorable	5.00	3.79	.000*	5.51	4.10	.000*	5.44	4.62	.002
Creative	4.68	2.74	.000*	4.98	3.06	.000*	5.24	3.15	.000*
Provocative	4.49	3.68	.001*	5.00	4.29	.014	5.42	4.55	.001*
Concise	4.68	4.77	.681	4.85	4.90	.768	4.92	5.27	.043
Dramatic	4.93	3.51	.000*	5.42	3.82	.000*	5.79	4.21	.000*
Emotive	3.89	3.24	.012	4.15	3.18	.001*	4.62	3.68	.001*
Meaningful	3.94	3.44	.050	4.21	3.88	.168	4.63	4.32	.135
Persuasive	3.48	3.29	.382	3.46	3.55	.712	3.93	3.62	.180

Note: Type 1 error controlled for with Bonferoni adjustment, * indicates significance: $\alpha < .002$

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