The Role of Salience and Novelty
in the Paraphrase of Metaphors

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Abstract

This study examines factors that affect the comprehension of metaphors by looking at whether attributions and/or relations are involved in comprehension. More specifically, this study seeks to discover what role implicit topic comparison and novelty play in metaphor comprehension. Twenty-five graduate and undergraduate students participated in the experiment which tested novelty and implicit topic comparison choice from 24 metaphors divided into three classes (attributive, relational, and double) of eight metaphors each. In one phase of the experiment, subjects were asked to choose one of four paraphrases which best described the given metaphor. In the other phase, subjects were asked to rate the metaphors as either unusual or common. This study shows that feature comparisons play an important role in metaphor comprehension, but that implicit comparisons seem to be an option when metaphors are more common, and when they are less incisive in their salience.

THE ROLES OF SALIENCE AND NOVELTY
IN THE PARAPHRASE OF METAPHORS

Introduction

Metaphor is often thought of in a literary, rather than a psychological, sense. A number of recent thinkers (Embler, 1966, Lakoff & Johnson, 1980; Lenrow, 1966; Ortony, Reynolds, & Arter, 1978; Winner, Rosenstiel, & Gardner, 1976; Wheelwright, 1962; Tourangeau & Sternberg, 1982; and Shank, 1984), however, believe that the study of metaphor may uncover the role metaphors play as an essential part of our everyday lives. Metaphors are all around us in that we continually speak, think, and act metaphorically. This study will address a number of factors that affect the ways in which metaphors are understood. In particular, factors that affect the ways that people paraphrase metaphors will be examined.

According to Lakoff and Johnson (1980), metaphors, by virtue of giving coherent structure to our experiences, create similarities of a new kind (p. 151). In other words, they hold that similarity is pertinent to metaphor only in the experience of people. Lakoff & Johnson (1980) have also argued that communication is grounded on the same conceptual system used in thinking and acting, and that this ordinary conceptual system is based on metaphor (pp. 3-6). Thus, if this is the case, metaphor is a particularly effective way of communicating various concepts; that is, as one of the figurative language communication tools.

Previous research (Ortony, 1983; Tourangeau & Sternberg, 1982; Lakoff & Johnson, 1980; and Black, 1962) have shown that people can understand certain statements as metaphorical. That is, they can discern the essence of the metaphor <u>as a metaphor</u>, or as an object to be accounted for in terms of itself. As Lakoff & Johnson (1980) point out, many metaphors shift from examples of language that draw attention to themselves to examples that make standard claims (p.52). What makes one metaphor more of an object to decipher, as opposed to another metaphor which is not perceived as anything other than a relatively straightforward claim? This study will examine the affects of salience and novelty on the focal versus the peripheral paraphrase of metaphors. There are a number of formal theories of metaphor; these theories are known as the comparison theory, the interaction theory and the anomoly theory.

Formal theories of metaphor

The comparison theory was originally formulated by Aristotle (Ortony, Reynolds, & Arter, 1978, p. 921). In his view, metaphor has an anological form such that the attributes of two or more objects are compared, and similarities are found between those objects. A number of modern theorists share this Aristotelian perspective. For instance, Barlow, Kerlin, and Pollio (1971) describe metaphor as "an implied comparison between two objects of unlike nature that have something in common" (p. 4). These objects

are called the tenor and the vehicle (Richards, 1936; cited in Ortony, Reynolds et al., 1978, p. 921). For example, in the metaphor "The community of man is an ant colony", "community of man" is the tenor and "ant colony" is the vehicle. The tenor becomes the subject of comparison, while the vehicle becomes that which has attributes to be placed on the tenor. The other important theoretical term in this comparison is called the ground (Richards, 1936; cited in Ortony, Reynolds et al., 1978, p. 921). The ground is the basis of comparison, or what the tenor and vehicle have in common. In the above example, the ground would emphasize man as being highly organized. Both tenor and vehicle share common features, which are brought together or discovered in the ground. Barlow, et al. (1971) support the notion that attributes of the vehicle are compared with the attributes of the tenor, and from this the meaning of the metaphor is derived. A literal/metaphorical process is at work here in which the tenor and vehicle are first seen in a literal sense. Then interpretation moves to a "deep structure" when it is discovered that the literal interpretation makes no sense. This deep structure interpretation is the metaphorical one, where the attributes of the comparison between tenor and vehicle become apparent. Thus a metaphor is simply seen in a literal sense first, and when no literal understanding is apparent, attributes from tenor and vehicle are compared, and a metaphorical meaning is put together.

Campbell's (1975; cited in Ortony, Reynolds et al.,

1978, p. 922) theory of metaphor deals with comparison by saying that all metaphors are implied oxymorons, or words of contradiction or incongruity. He also notes that the strength of a metaphor stems from its inability to be effectively restated in a literal fashion. A strong metaphor, in other words, has many meanings (Ortony, Reynolds et al., 1978). Here, too, strength is found in the metaphor where similarity is at a minimum. Thus a weak metaphor would be considered as one in which similarity is clearly seen, and a literal restatement can be at least closely contrived.

Within the context of comparison theory, Bréal (1897; cited in Ortony, Reynolds et al., 1978, p. 922) discerned the notion of novel and frozen metaphors. Frozen metaphors are those which may have been original at one time, but through time, have become so ordinary as to practically lose their metaphorical impression. Ortony, Reynolds, and Arter (1978) point out that "running cars", "legs of triangles", or "catching colds" are no longer thought of as metaphors, and as such are dead metaphors. Novel metaphors, on the other hand, are those more or less original metaphors that retain their comparative similarities.

The interaction theory of metaphor deals with the carrying of one system of beliefs into another system, such that the interaction produces insight. This interaction is a process of category transfer. Tourangeau and Sternberg (1982) describe the vehicle as being a gauge for seeing the tenor in a new way. Here, the idea of a principle subject (tenor) and

a subsidary subject (vehicle) come into play such that the subsidary subject gives a sense of what the principle subject is like. For example, in "Man is a rat", rat is the subsidary subject describing what man (the principle subject) is like (Denz, 1984). Here, Black (1962 cited in Ortony, Reynolds et al., 1978, p. 923) would say that in this interaction, metaphor emphasizes, selects, or suppresses features of the principle subject by using features of the subsidary subject. This, therefore, involves "shifts in meaning of words belonging to the same family or system as the metaphorical expression; and some of these shifts, though not all, may be metaphorical transfers" (Black, 1962, pp. 44-45).

Wheelwright (1962) proposed a "tensive view" of metaphor. He describes two elemental types of metaphor within the interaction view. The first type, which he calls epiphor, begins by "assuming a usual meaning for a word; it then applies this word to something else on the basis of, and in order to indicate, a comparison with what is familiar" (p.72). It indicates similarity between relatively well known and unknown subjects (Ortony, Reynolds et al., 1978, p. 923). Diaphor, the second type, is illustrated by movement through "certain particulars in a fresh way, producing new meaning by juxtaposition alone" (p.78). It is here that words, phrases, or sentences, though they may or may not be metaphorical on their own, can be metaphorical when looked upon as a whole. Wheelwright's example of this is, "My country 'tis of thee, sweet land of liberty, higgledy-piggledy my black hen" in

which the intention is not to focus on countries or hens, but, as a whole, to focus on an unpatriotic statement. Thus, it can be seen that the interaction view of metaphor is one of function rather than one of grammar so that the elements blend into a new whole (Ortony, Reynolds et al., 1978, p.923).

Perrine (1971) uses a four form classification scheme to describe the interaction view. In this view there are four combinations of implicit and explicit tenors and vehicles. The first form shows both tenor and vehicle being explicity stated. In "Federal support of abortion is a thorn bush", federal support for abortion is explicitly compared to a thorn bush. The second form is one in which the actual vehicle is not explicit, even though the actual tenor is stated. In "Sheathe thy impatience" the tenor is impatience, and the vehicle a sword. The third form is one in which the vehicle is explicitly stated while the tenor is not, as in "Don't put the cart before the horse", where some action is potentially out of sequence. Proverbs fall into this form. The fourth form shows that neither the tenor nor the vehicle is explicit, as in, "Let us eat, drink, and be merry, for tomorrow we shall die", where festivity is not urged, but to say that life is short and should be enjoyed fully. So it is seen that the interaction theory is one of transfer, which produces insight, a process of thought.

There are no specific criteria for strength and weakness in the interaction theory. According to Black (1962; cited in

Ortony, Reynolds et al., 1978, p. 923), there is no reason "why some metaphors work and others fail" (Black, 1962, pp. 44-45).

In the anomaly theory, the ground of the tenor and vehicle is the basis of dissimilarity between the two. Thus the vehicle is equated with the tenor, but this is then taken to be a false equation. Van Dijk (1975) describes this process of metaphorical interpretation by calling metaphorical sentences sortally (categorically) incorrect (p. 189). Some, on the other hand, are simply contextually false under literal interpretation. This is a process where a metaphorical structure is transfered to a higher level of abstraction. When this happens, grammatical rules are used to put together a new, partial and abstract description of the structure. In turn new grammatical rules (transfer rules) are added to apply meaning to metaphorical structures. Here, the tenor and vehicle are abstracted to reduce ground tension and thus provide meaning to the structure (Tourangeau & Sternberg, 1982 p. 210).

The strength of a metaphor, according to anomoly theory, lies in incongruity and novelty. Complexity also plays an important role in making metaphor interesting. As for weakness, more similarity or congruity makes a metaphor dull, as it becomes less obscure (Tourangeau & Sternberg, 1982). Van Dijk (1975) elaborates on these points by proposing that literal meanings are limited to a more restricted region of logical space, while the range of metaphorical meanings is

larger and more general. Thus, the less range, in a logical space, the less strength a metaphor has, because it converges upon a narrower range of logical space. Therefore, as the range widens, the metaphorical meaning becomes, at least potentially, better.

These three theories of metaphor (the comparison theory, the interaction theory, and anomoly theory) are by no means the only theories on metaphor. They are, however, three of the more traditional theories, and have had the most impact upon psychological research.

Metaphors in Psychological Research

Ortony, Schallert, Reynolds and Antos (1978) propose a model of metaphor in which "a hearer or reader uses an already constructed representation of what has gone before (the context) as a conceptual framework for interpreting a target sentence, or any linguistic unit" (p. 467). In saying this, Ortony, Schallert et al. (1978) argue that the assumption that nonliteralness inhibits interpretation ease is incorrect. However, this in turn would entail that, given insufficient contextual support, a target needing a metaphorical interpretation would take longer to interpret than a target needing a literal interpretation.

In one experiment, "vignettes" were used with a preceeding context and a "sentence-length" target. There were two kinds of contexts, one needing a metaphorical interpretation and another needing a literal one. Ortony,

Schallert et al. (1978) measured the time it took subjects to understand the target after reading the context. The experiment also measured reaction times for understanding, when short contexts were used, since they hypothesized that a shorter context would require that a target take longer to be understood. It was found that the time needed to understand a literal context target and a metaphorical context target did not differ. However, the time needed to understand a short literal context target and a short metaphorical context target did differ, in that it took a longer period of time to understand the short metaphorical context target, as was predicted.

In a second experiment, Ortony, Schallert et al. (1978) measured the time it took a subject to understand a target sentence given different kinds of contexts; in this case a nonliteral or idiom version, a literal version, and a control version were used. In the idiom version the target was expected to be interpreted idiomatically. In the literal version, where the target was the same as the previous target (i.e. the idiom version), literal interpretation was expected. Finally, in the control version, in which the target was a literal paraphrase of the previous idiom, literal interpretation was also expected. It was found that idioms do not take any longer to interpret than literals of the same expressions, and that, in fact, idioms may be understood more quickly than literal targets.

Ortony, Schallert et al. (1978) have given empirical

support to the claim that, given a proper context, metaphorical statements can be interpreted at least as quickly as literal ones. They also found that a hearer or reader does use a conceptual framework for interpreting metaphors, and in so doing uses many schemata in order to comprehend those metaphors. This process is very similar to the process of comprehending literal statements, given a context of sufficient length.

In another article, Ortony (1979) describes metaphoricity as being a salience imbalance which is highlighted by attribute inequality. He also argues that "nonliteral similarity statements will tend to be much less reversible (for example, 'man is a wolf' vs. 'a wolf is a man') than literal similarity statements, and that, in cases in which reversals still result in meaningful comparisons, the meaning change will be greater for similes than for literals" (p. 179). Overall, Ortony holds that metaphoricity is a characteristic of similarity statements.

In examining the implications of metaphor in education, Ortony (1983) discusses metaphoric competence in children, beginning with grade school populations. He found that children in grades 2 through 5 could not only understand literal conditions, but had the "cognitive processes required to relate the two domains metaphor and literal" (p. 20). He also discovered that four-year olds had these cognitive processes available to them. In his final analysis, Ortony questioned whether there was enough knowledge about metaphor

to suggest changes in classroom and instructional practices. In answer to his question he stated that "we know enough already to be able to say with some confidence that much of what is taught about figurative language to children in the early grades is based on theoretical quicksand" (p. 33). So how can metaphor be used effectively in the educational process? In their reflection on Ortony's (1983) paper, Rogers and Fielding (1983) seem to think that although care must be taken in exposing children to a teaching of metaphor, it does seem "that what is instructionally sound in other areas of comprehension teaching should be equally sound in helping children to understand metaphors" (p. 41). Here, choosing appropriate examples is important, such that examples can be "selected from what children are already reading" (p. 41). Also metaphors should relate sufficiently to their context. If a child has trouble understanding metaphors, a possible solution may be to relate them to similes, or provide more sufficient background knowledge. So it can be said that Ortony (1983) and Rogers and Fielding (1983) believe that metaphor does have a place in education and metaphor instruction should be used.

As previously stated, Lakoff & Johnson (1980) argue for a model of metaphor in which communication is grounded on the same conceptual system used in thinking and acting which, in turn, is itself based on metaphor. In this model it is held that concepts govern our functioning in the world. These concepts structure what we perceive and how we perceive

things in the world around us. In everyday life, these concepts are not readily noticed and we frequently go about our actions automatically, though along certain, metaphorical, lines. Evidence of these ways of acting and thinking about things can be found in language. It is assumed that language is an important source for discovering how we act and conceptualize. Lakoff & Johnson (1980) attempt to show how this is true. They take, as one instance, the concept "argument" to describe this conceptualization. In the metaphor ARGUMENT IS WAR, they attempt to show how we speak when we argue. For instance, when arguing, it is common for one to say something like, "Your claims are **indefensible.**" or "He **shot down** all of my arguments". Both of these instances are contained in the metaphor ARGUMENT IS WAR and are thus themselves metaphorical statements. What is important to understand here, however, is that, in this metaphorical communication, one can actually win or lose an argument. Arguments are not just talked about in terms of war, they are seen as the basis for action. Thus, it can be concluded that, "the essence of metaphor is understanding and experiencing one kind of thing in terms of another" (p. 5). Argument is thus structured, understood, performed, and talked about in terms of war.

Barlow, Pollio, & Fine (1977) have explored the role of metaphor in psychotherapeutic communication. Their ideas are based on the work of Lenrow (1966; cited in Barlow et al., 1977, p. 214), whose model is in the form of seven functions

that metaphorical language might serve in therapy. Lenrow's functions are:

1) Metaphors provide a model of willingness to try out novel ways of looking at behavior, that is, the patient models the therapist in metaphorizing.

2) Metaphors function to simplify events in terms of a schema or model which will emphasize some elements more than others.

3) An intimate or personal quality is achieved by the concrete referents of figurative language.

4) Metaphors have a half-playful, half-serious quality that permits the therapist to communicate about intimate characteristics of the patient without appearing intrusive.

5) The form of the metaphor is especially well-suited for asserting the effective equivalence of apparently dissimilar concepts or events.

6) To the extent that metaphors refer to an interaction between an object and its environment, they are well-suited for highlighting subtle social roles that a patient takes.

7) Metaphoric concepts, once learned, are likely to transfer readily to new situations that the person enters or to old ones s/he reenters (Lenrow, 1966).

These give a good indication of metaphor's practical use in therapy. Barlow et al. find these functions helpful when

they give an example of a therapy session in which the patient uses metaphorical language to express feelings and thoughts. It was found in analyzing these metaphors that the therapist was able to use them to help the patient discover his problem and find a solution. So it would appear that metaphor can be used and sought in therapy to effectively help a patient.

By reviewing the literature, different theories of metaphor have been presented. It was shown that the comparison theory deals with metaphor by explaining it as a comparison between two objects (tenor and vehicle) of unlike nature that share something in common (ground) (Barlow, Kerlin, and Pollio, 1971). The interaction theory is somewhat similar to the comparison theory, but explains that metaphor deals with the carrying of one system of beliefs into another, such that the interaction produces insight. Anomoly theory presents the ground of the tenor and vehicle as the basis of dissimilarity between the two. The vehicle is equated with the tenor, but is then taken to be a false equation. Lakoff and Johnson (1980) argue for a model of metaphor in which communication is grounded on the same conceptual system used in thinking and acting which, in turn, is itself based on metaphor.

Finally, experiments were discussed, as well. Ortony, Schallert, Reynolds, and Antos's (1978) experimentation showed that metaphorical interpretations need not take longer than literal ones when subjects are given sufficient

contexts. They also discovered that a hearer or reader uses a conceptual framework for interpreting metaphors, and in so doing, uses many schemata in order to comprehend those metaphors. Barlow, Pollio, and Fine (1977) have found that patients use metaphorical language to express feelings and thoughts, and that in analyzing these metaphors, the therapist is able to use them to help patients discover problems and find solutions.

Ortony (1983), and a number of other theorists cited in this study, have argued that the basis for metaphorical comprehension lies in the evaluation of similarity between topic and vehicle, while Lakoff and Johnson (1980) have maintained that metaphors are used to structure concepts, and that the comprehension of metaphors lies in their ability to bring forth certain claims. In the case of similarity judgement, it is expected that the comprehender focuses on some salient aspect of the actual metaphor. In the communication case, it is expected that the comprehender pays less attention to the actual structure of the metaphor, and more attention to what the metaphor claims. Therefore, it is hypothesized that metaphors that are novel (unusual) will be comprehended in terms of determining what the basis for the metaphor actually is, while more common, or usual metaphors will be comprehended in terms of what the metaphor is trying to say. These differences will be ascertained by asking subjects to choose one of a carefully constructed set of paraphrases for each metaphor.

Formal Statement of Hypotheses

The purpose of this study is to examine factors that affect the comprehension of metaphors. Comprehension of metaphors consists of two parts; 1) an understanding of the metaphor itself, and 2) an understanding of what the metaphor is claiming. Gentner and Stuart (1984) argue that metaphors are based either on comparison of attributes, comparison of relational aspects, or both. Therefore, an understanding of the metaphor itself will reflect an understanding of whether attributes and/or relations are involved in the comparison. These understandings can be demonstrated by a particular type of paraphrase of the metaphor involved, of the general form: "both X and Y are (relational property/attributive property/both)." Another way that a metaphor could be paraphrased, however, would be as if the comparison that serves as the basis of the metaphor were not referred to in any explicit fashion; instead, some straightforward claim is presented. For example, the metaphor, "a doctor is a repairman," might be simply paraphrased as "doctors fix people." The comparison, "just like repairmen fix the things they fix," is not explicitly stated in the paraphrase. Note also that this implicit comparison preserves the topic as the subject of the statement, since it is the topic that is the object that "begs" comparison.

Several factors can be hypothesized to affect whether or not a given paraphrase of a metaphor involves an explicit or an implicit statement of the comparison. Sample means for

three types of metaphors were identified from Gentner and Stuart (1984); namely, attributive (μ_1), relational (μ_2), and double comparison features(μ_3). The first hypothesis of the study was to assert that these features did not matter in terms of the judged novelty of a given metaphor. That is, when subjects are asked to rate the novelty of a set of metaphors, novelty would be based on factors other than types of features of comparison. This hypothesis is of the following form:

a) dependent variable: rated novelty

b) independent variable: type of comparison feature

c) $H_o: \mu_1 = \mu_2 = \mu_3 = \mu_o$.

d) H_a: For at least one $\mu_j, \mu_j \neq \mu_o$.

The second hypothesis depended upon the acceptance of the null hypothesis for the first hypothesis. In other words, given that novelty was distributed evenly across the three featural conditions, it was hypothesized that novelty would be highly and inversely correlated with the choice of implicit paraphrases. This hypothesis is of the following form:

a) first variable: rated novelty

b) second variable: choice of implicit comparison (di-chotomous choice)

c) $H_o: \rho_1 = 0$

d) $H_a: \rho_1 < 0$

Since the null hypothesis was rejected for the first hypothesis, the second hypothesis could not be tested. Instead, another hypothesis was examined. In this case, the choice of implicit topic comparison was used as the dependent variable, while featural type was retained as an independent variable. This hypothesis is of the following form:

a) dependent variable: choice of implicit topic para-
   phrase

b) independent variable: type of comparison feature

c) $H_o: \mu_1 = \mu_2 = \mu_3 = \mu_o$

d) H_a: For at least one $\mu_j, \mu_j \neq \mu_o$

Subjects

Twenty five students from Saint Meinrad College Seminary volunteered to act as subjects for this study. These subjects ranged in age from their late teens to near 40, and they spanned all levels of the college, from freshman year to the college graduate program.

Materials

A set of materials from Gentner and Stuart (1984) were adapted for use in this study. These materials consisted of 24 metaphors, divided into 3 classes with 8 metaphors per class. The first class consisted of metaphors where the comparison depended upon attributes (e.g., jellybeans are balloons). The second class consisted of metaphors where the comparison depended upon relations (e.g., clouds are

sponges). Finally, the third class consisted of metaphors where the comparison combined both attributes and relations (e.g., plants stems are drinking straws). A complete list of metaphors used can be found in Appendix 1.

Two different sets of dependent variables were measured, using this metaphor set. First of all, the metaphors were presented by computer one at a time, and a seven point scale was attached to each metaphor, such that a rating of one meant "very common" and a rating of seven meant "very unusual." The order of metaphors was randomized for each subject. Next, each metaphor was presented one at a time, as a stem for a four-option multiple-choice question. These options were generated in the following manner; a) an explicit comparison based on attributes, b) an explicit comparison based on relations, c) a statement about the topic where an implicit comparison is drawn, and d) a statement about the vehicle where an implicit comparison is drawn. Both the order of each option was randomized for each question and the order of metaphors was randomized for each subject. The following is an example:

        A cloud is a sponge.
            a) both clouds and sponges are wet.
            b) both clouds and sponges hold water.
            c) rain comes out of swollen clouds.
            d) water comes out of swollen sponges.

Appendix 2 contains a list of all metaphors and their options.

Design

Two separate analyses were performed. Each analysis used a three (feature type) level repeated-measures ANOVA. The first analysis used composite novelty ratings per category by subject as the dependent variable. In other words, the novelty ratings were collapsed by category for each subject, yielding three scores per subject. The second analysis used the number of implicit topic comparison choices per category for each subject as the dependent variable, again yielding three scores per subject. Both analyses used the attribute/relational/double feature breakdown as the independent variable.

Each subject supplied both novelty data and paraphrase data. Order of data collection (paraphrase vs. novelty judgement) was randomly counterbalanced across subjects. As mentioned in the previous section, order of metaphors and order of choices were also randomly varied.

Procedure

Both tests were programmed on a DEC-10 microcomputer. Subjects were asked to sit down before the terminal. Then, a random number was entered into the program, to set up appropriate randomization procedures. Whether the subject was to start with the novelty or the paraphrase task was determined by random assignment prior to the experiment.

For the novelty condition, subjects were given a set of directions to read. The exact directions used can be found in

Appendix 3. After the subjects read the directions and indicated that they understood them, the program was initiated. (In the novelty case, two misspellings were discovered. These were corrected for the subjects orally by the experimenters. Subsequent inspection showed that the two misspelled cases did not differ substantially from other metaphors in their same class, and so were included in the analysis.)

For the paraphrase condition, subjects were also given directions about paraphrasing. These directions also can be found in Appendix 3. Again, once the instructions were read, the program began. There were no recorded difficulties with using or understanding this program by the subjects.

Prior to the experiment, all subjects were informed of their right of nonparticipation, and the privacy of individual results was guaranteed. All subjects understood these rights, and chose to participate. At the end of data collection, subjects were thanked and were invited to a personal de-briefing session.

Results

Two repeated-measure ANOVAs were performed to address hypothesis 1 and hypothesis 3. For the first hypothesis, there was a significant composite novelty effect for the main effect ($F_{(2,48)}$ = 15.97, MSe = 28.72, $p < .01$). A Tukey test was performed as a post-hoc test of the means. According to post-hoc analysis, the double metaphors were rated as being

more common than the relational metaphors ($q = 4.56$, $q_k^! = 3.44$, $p < .05$), and the relational metaphors were rated as being more common than the attribute metaphors ($q = 4.00$, $q_k^! = 3.44$, $p < .05$). Descriptive data for these results are found in Appendix 4. Since the main effect was significant, the null hypothesis was rejected. There were clear composite differences in novelty among the three types of metaphors. These differences rendered a test of the second hypothesis impossible, since such a test would depend upon no overall differences in novelty among the three groups, so that the groups could be collapsed into one set of data.

The test of the third hypothesis again yielded a significant effect ($F_{(2,48)} = 29.06$, MSe $= 0.62$, $p < .01$). Again, a Tukey test of the means was performed. For this analysis, the double metaphors had more composite choices of implicit topic paraphrases than the relational metaphors ($q = 1.10$, $q_k^! = 0.54$, $p < .05$), while there were no significant differences between the relational and the attribute metaphors ($q = 0.48$ $q_k^! = 0.54$, n.s.). Descriptive data for these results are found as Appendix 5.

For the paraphrase task, it became clear that implicit comparisons for both attribute metaphors and relational metaphors were very low. For the attribute metaphors, there was a mean of 0.64 implicit topic paraphrase choices across the 8 metaphors, while the same mean for the relational metaphors was 1.08. Selection of implicit topic paraphrase was much higher for the double condition ($\overline{X} = 2.28$). A sign

test was done to determine overall use of implicit topic paraphrase. This test indicated that there was a lower use of these implicit paraphrases than would be expected ($Z = -2.98$, $p < .05$).

For each group, a mean number of appropriate explicit choices per category was computed. For the attribute metaphors, there was a mean of 6.44 choices of explicit attribute comparisons across the 8 metaphors in the category. For the relational metaphors, there was likewise a mean of 6.44 choices of explicit relational comparisons across the 8 categories. These figures seem to support the idea that implicit choices are "crowded" out by explicit choices for the relational and attribute cases.

Discussion

In this study, an attempt has been made to examine factors that allow metaphors to be effective conceptual and communicative tools. It was determined that responses to the three metaphor categories (attributive, relational, and double) were not equal. What is important to see, however, is how the categories are unequal. As seen from the results of this study, implicit paraphrases do not show themselves to be common in metaphor. Nevertheless, it is interesting to notice how prevalent they are in the double category. The double category showed twice as many instances of implicit topic paraphrase as the relational category, and almost four times as many instances than the attributive category.

It was clearly shown that explicit paraphrases are highly linked to their respective categories; that is, paraphrases of relational nature are linked tightly to the relational category, and attributive paraphrases are highly linked to the attributive category. This does not seem surprising in light of other studies previously mentioned above. Thus, though the rate of selection of implicit topic praphrases, was lower than expected across all categories, there is perhaps still room for more investigation into their association with the double category. That is, the role of salience for single factors seems clear, but the question of multiple salience needs further research.

The difficulty in not being able to sort out novelty effects and paraphrase effects is interesting. No correlation was possible between these effects, since novelty was not distributed evenly across the three categories. Thus, it would still be of interest to test the second hypothesis, given that novelty can be distributed equally across all categories.

In summary, this experiment supports the idea that feature comparisons play an important role in metaphor comprehension. Furthermore, explicit comparisons are related to high single salience of material. On the other hand, implicit comparisons seem to be an option, not only when metaphors are more common, but also when they are less clear-cut in their salience. More research is needed to clarify this central issue.

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Appendix 1

List of metaphors used

RELATIONAL METAPHORS

The moon is a lightbulb.
A camera is a tape-recorder.
A ladder is a hill.
A cloud is a sponge.
A roof is a hat.
Tree bark is skin.
A tire is a shoe.
A window is an eye.

ATTRIBUTIVE METAPHORS

Jelly beans are balloons.
A cloud is a marshmallow.
A football is an egg.
The sun is an orange.
A snake is a hose.
Soap suds are whipped cream.
Pancakes are nickels.
A tiger is a zebra.

DOUBLE METAPHORS

A doctor is a repairman.
A kite is a bird.
The sky is an ocean.
A hummingbird is a helicopter.
Plant stems are drinking straws.
A lake is a mirror.
Grass is hair.
Stars are diamonds.

Appendix 2

List of metaphors with their options

RELATIONAL METAPHORS

1) The moon is a lightbulb.
   a) both the moon and lightbulbs are round
   b) both the moon and lightbulbs give off light
   c) nights are dark without the moon
   d) rooms are dark without lightbulbs

2) A camera is a tape-recorder.
   a) both cameras and tape-recorders are metallic
   b) both cameras and tape-recorders record things
   c) pictures capture exactly what we see
   d) tapes capture exactly what we hear

3) A ladder is a hill.
   a) both ladders and hills are steep
   b) both ladders and hills are climbed
   c) getting up a ladder requires great effort
   d) going up a hill requires great effort

4) A cloud is a sponge.
   a) both clouds and sponges are wet
   b) both clouds and sponges hold water
   c) rain comes out of swollen clouds
   d) water comes out of swollen sponges

5) A roof is a hat.
   a) both a roof and a hat come to a peak
   b) both a roof and a hat act as shelter
   c) roofs keep our houses dry
   d) hats keep our heads covered

6) Tree bark is skin.
   a) both tree bark and skin are dry and flaky
   b) both tree bark and skin cover living tissue
   c) tree bark shields trees from harsh weather
   d) our skin protects us from heat and cold

7) A tire is a shoe.
   a) both tires and shoes are black and rubbery
   b) both tires and shoes are used for traveling
   c) tires keep our rims off the pavement
   d) shoes keep our bare feet off the ground

Appendix 2 continued

8) A window is an eye.
   a) both windows and eyes are clear
   b) both windows and eyes act as openings
   c) people look out on the world through windows
   d) the brain looks out on the world by using our eyes

ATTRIBUTIVE METAPHORS

1) Jelly beans are balloons.
   a) both jelly beans and balloons are colorful
   b) both jelly beans and balloons amuse children
   c) jelly beans come in a variety of flavors
   d) balloons come in a variety of shapes and colors

2) A cloud is a marshmallow.
   a) both clouds and marshmallows are white and fluffy
   b) both clouds and marshmallows are decorative
   c) clouds float in the sky
   d) marshmallows float in cocoa

3) A football is an egg.
   a) both footballs and eggs are oblong
   b) both footballs and eggs are hard to handle
   c) footballs have a funny shape and bounce funny
   d) eggs wobble when they roll

4) The sun is an orange.
   a) both the sun and an orange are round
   b) both the sun and an orange are healthy
   c) the sun puts out a beautiful glow
   d) the skin of an orange is bright and pleasant

5) A snake is a hose.
   a) both snakes and hoses are long and thin
   b) both snakes and hoses can be used to scare off birds
   c) snakes move with many bends and turns
   d) hoses lie bent and turned in the grass

6) Soap suds are whipped cream.
   a) both soap suds and whipped cream are white and foamy
   b) both soap suds and whipped cream are used for lathering
   c) soap suds pile up in fluffy piles
   d) whipped cream is a fluffy topping

7) Pancakes are nickels.
   a) both pancakes and nickels are round and flat
   b) both pancakes and nickels are found in bunches
   c) kids love little round pancakes
   d) kids like to get nickels

Appendix 2 continued

8) A tiger is a zebra.
   a) both tigers and zebras have stripes
   b) both tigers and zebras live in the wild
   c) tigers look like striped cats
   d) zebras look like striped horses

DOUBLE METAPHORS

1) A doctor is a repairman.
   a) both a doctor and a repairman are professionals
   b) both a doctor and a repairman fix things
   c) doctors cure ails with medicines
   d) repairmen fix breaks with tools

2) A kite is a bird.
   a) both kites and birds are light and thin
   b) both kites and birds fly in the sky
   c) kites dip and bend in the breeze
   d) birds glide in the currents

3) The sky is an ocean.
   a) both the sky and the ocean are blue
   b) both the sky and the ocean are vast expanses
   c) the sky is a featureless place
   d) the sea is a featureless surface

4) A hummingbird is a helicopter.
   a) both hummingbirds and helicopters are fast
   b) both hummingbirds and helicopters rotate as they fly
   c) hummingbirds hover over flowers
   d) helicopters hover over the ground

5) Plant stems are drinking straws.
   a) both plant stems and drinking straws are thin and hollow
   b) both plant stems and drinking straws draw up water
   c) plants drink water from the ground
   d) kids drink sodas through straws

6) A lake is a mirror.
   a) both lakes and mirrors are flat and smooth
   b) both lakes and mirrors reflect light
   c) one can see one's reflection on a still lake
   d) one can use a mirror to see oneself

7) Grass is hair.
   a) both grass and hair are fine and thin
   b) both grass and hair act as coverings
   c) grass is a thick and desirable crop
   d) everyone wants a full head of hair

Appendix 2 continued

8) Stars are diamonds.
   a) both stars and diamonds are bright and shiny
   b) both stars and diamonds are beautiful
   c) stars sparkle on a clear night
   d) diamonds sparkle against black velvet

Appendix 3

Directions for tests

PARAPHRASE DIRECTIONS

THIS IS AN EXPERIMENT DEALING WITH THE WAY THAT PEOPLE UNDERSTAND METAPHORS. ONE WAY THAT PEOPLE SHOW THAT THEY UNDERSTAND IS BY BEING ABLE TO PARAPHRASE. IN THIS EXPERIMENT, YOU WILL SEE A NUMBER OF SENTENCES. UNDER EACH SENTENCE ARE FOUR CHOICES. YOU ARE TO SELECT THE CHOICE THAT YOU FEEL IS THE BEST PARAPHRASE OF THE SENTENCE. IN OTHERWORDS, WHICH CHOICE DO YOU THINK IS MOST LIKE WHAT THE PERSON WHO WROTE THE SENTENCE WAS TRYING TO SAY.

IF YOU HAVE ANY QUESTIONS, PLEASE STOP AND ASK THE EXPERIMENTER.

WHEN YOU ARE READY, HIT THE RETURN KEY TO BEGIN THE EXPERIMENT.

NOVELTY DIRECTIONS

IN THIS EXPERIMENT, YOU WILL SEE A NUMBER OF METAPHORICAL SENTENCES. SOMETIMES, METAPHORS ARE VERY SURPRISING AND UNUSUAL, AND SOMETIMES THEY ARE FAIRLY ORDINARY-SOUNDING. YOU WILL READ EACH SENTENCE, AND AFTER YOU READ THE SENTENCE, YOU WILL RATE THE SENTENCE ON A SCALE FROM 1 TO 7, WHERE 7 IS "VERY UNUSUAL" AND 1 IS "VERY COMMON."

IF YOU HAVE ANY QUESTIONS, STOP AND ASK THE EXPERIMENTER.

PRESS THE RETURN KEY TO BEGIN.

Appendix 4

Descriptive Data of Composite Novelty Ratings

	Relational		Attributive		Double		Totals	
	R	R^2	A	A^2	D	D^2	T	T^2
1)	32	1024	36	1296	22	484	90	8100
2)	35	1225	42	1764	38	1448	115	13225
3)	34	1156	39	1521	27	729	100	10000
4)	42	1764	53	2809	38	1448	133	17689
5)	35	1225	37	1369	24	576	96	9216
6)	17	289	35	1225	23	529	75	5625
7)	31	961	21	441	17	289	69	4761
8)	28	784	45	2025	23	529	96	9216
9)	34	1156	32	1024	24	576	90	8100
10)	23	529	28	784	19	361	70	4900
11)	37	1369	35	1225	24	576	96	9216
12)	26	676	32	1024	23	529	81	6561
13)	29	841	40	1600	35	1225	104	10816
14)	34	1156	31	961	25	625	90	8100
15)	39	1521	49	2401	36	1296	124	15376
16)	26	676	30	900	21	441	77	5929
17)	33	1089	19	361	31	961	83	6889
18)	23	529	39	1521	34	1156	96	9216
19)	32	1024	33	1089	28	784	93	8649
20)	34	1156	31	961	29	841	94	8836
21)	27	729	37	1369	38	1448	102	10404
22)	42	1764	45	2025	31	961	118	13924
23)	49	2401	43	1849	29	841	121	14641
24)	31	961	33	1089	31	961	95	9025
25)	35	1225	43	1849	24	576	102	10404
total:	808	27230	908	34482	694	20190	2410	238818

Means and Standard Deviations of Composite Novelty Ratings

	X	S.D.
Relational	32.32	6.68
Attributive	36	7.75
Double	27.76	6.04

Appendix 5

Descriptive Data of
Composite Choices of Implicit Topic Paraphrases

	Relational		Attributive		Double		Totals	
	R	R^2	A	A^2	D	D^2	T	T^2
1)	2	4	0	0	2	4	4	16
2)	0	0	1	1	2	4	3	9
3)	1	1	0	0	3	9	4	16
4)	2	4	0	0	2	4	4	16
5)	0	0	0	0	2	4	2	4
6)	0	0	1	1	0	0	1	1
7)	4	16	3	9	2	4	9	81
8)	3	9	2	4	2	4	7	49
9)	2	4	1	1	2	4	5	25
10)	0	0	1	1	1	1	2	4
11)	1	1	4	16	2	4	7	49
12)	1	1	1	1	2	4	4	16
13)	0	0	0	0	3	9	3	9
14)	0	0	0	0	2	4	2	4
15)	1	1	1	1	4	16	6	36
16)	2	4	0	0	2	4	4	16
17)	1	1	0	0	3	9	4	16
18)	1	1	1	1	2	4	4	16
19)	3	9	0	0	3	9	6	36
20)	2	4	0	0	3	9	5	25
21)	0	0	0	0	1	1	1	1
22)	0	0	0	0	2	4	2	4
23)	1	1	0	0	2	4	3	9
24)	0	0	0	0	5	25	5	25
25)	0	0	0	0	3	9	3	9
total:	27	61	16	36	57	133	100	492

Means and Standard Deviations of
Composite Choices of Implicit Topic Paraphrases

	X	S.D.
Relational	1.08	1.13
Attributive	0.64	1.02
Double	2.28	.96