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Why do metaphors seem deeper than similes?

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Abstract

Figurative expressions in metaphor form (e.g., *Marriage is a journey*) seem stronger and deeper than expressions in simile form (e.g., *Marriage is like a journey*). We ran a study to examine the nature of these judgments. Participants read short paragraphs describing either object attributes or relational structure and then made a forced choice of the grammatical form of a figurative expression mentioning the target concept referred to in the passages. The results showed that the metaphor form was chosen more often (1) for expressions with conventional bases, and (2) when figurative statements followed contexts containing relational information. We speculate about a possible linkage between conventionalization and relationality.

Introduction

Nominal figurative statements can be expressed in two ways – in simile form (*X is like Y*) and in metaphor form (*X is Y*). Although the two grammatical forms largely serve the same purpose (showing that one entity is figuratively similar to another), people report that expressions in metaphor form feel more profound and express stronger claims than expressions in simile form. For example, saying *Her heart is a stone* feels deeper than *Her heart is like a stone*. Further, several studies (Gibb & Wales, 1990; Bowdle, 1998; Aisenman, 1999) have found that if people are asked to make a choice between an expression in metaphor form or the same expression in simile form, the simile form is chosen more often. It appears that people are more conservative in using metaphors than in using similes.

The greater force of the metaphoric form was noted by Glucksberg and Keysar (1990), who proposed that the metaphor form is the basic form of figurative statements and that similes are understood as variants of metaphors. Noting that the grammatical form of metaphors matches that of category inclusion statements, they suggested that metaphors in fact function as category inclusion statements, where the category is an abstraction that can be accessed or created from the metaphor's base concept. (We will use the terms *target* and *base*, respectively, for the X and Y terms, of a figurative expression *X is [like] Y*.) There has been debate concerning the processing implications of this theory, but for our purposes the key point is Glucksberg and Keysar's insight that the grammatical form of figurative statements has psychological force, with metaphor being the stronger, more categorical form. This paper examines the reasons for this phenomenon.

Two recent theories have proposed different explanations for the simile-metaphor difference. One account singles out the conventionality of the base term; the other, the relationality/attributionality of the metaphor's interpretation. The first account, the Career of Metaphor hypothesis (Bowdle & Gentner, 1999; Gentner & Bowdle, 2001) suggests that the difference lies in the conventionality of the base term: figuratives with conventional bases are expressed as metaphors, and those with novel bases are expressed as similes. The second account, Aisenman's (1999) Relational Precedence hypothesis, suggests that the difference is due to the kind of interpretation the expression receives: relational interpretations are stated as metaphors, and attributional interpretations are stated as similes.

In their research on metaphor processing, Gentner and Wolff (1999) proposed an important distinction between newly minted figuratives and conventionalized figuratives. According to the Career of Metaphor hypothesis, figuratives with novel bases, such as *An encyclopedia is (like) a uranium mine,* are processed by comparison between the target and the literal meaning of the base. In contrast, figuratives with conventional bases, such as *An encyclopedia is a goldmine,* can be processed by alignment with a conventional abstraction (e.g., *a source of something valuable*) associated with the base term. The key difference between novel and conventional bases is that the representations of conventional bases include a secondary metaphoric meaning along with the original literal meaning. They have become polysemous. In contrast, representations of novel bases contain only a literal meaning.

Gentner and Wolff (1997) proposed that conventional metaphoric meanings are created over time as a result of repeated comparisons of different

target terms with the same base. The idea is that through progressive alignments of the base, a set of properties or a relational schema belonging to the base emerges as a separable abstraction. This can become an additional word sense – a kind of metaphoric category associated with the base.

Bowdle's Grammatical Concordance principle links the Career of Metaphor hypothesis with the simile-metaphor distinction. It states that metaphoric expressions are interpreted by the process of structural alignment (Gentner & Markman, 1997), but the nature of the invited alignment differs for metaphors and similes. The simile form invites directly aligning the literal base and target concepts (e.g., *encyclopedia* and *gold mine* in the above example), whereas the metaphor form suggests that the listener should first access the abstraction associated with the base – e.g., *source of something valuable* -- and then align it with the target representation. Consistent with this explanation, Gentner and Bowdle (2001) found that novel metaphors are slow to process. This follows from the claim that such statements lead to a false start in processing. For example, hearing *That encyclopedia is a uranium mine* is infelicitous, because there is no conventional abstraction associated with uranium mines.

Thus, the claim is that (1) repeated alignments can lead to the formation of an abstraction, and (2) figurative statements can occur in metaphor form only when there is existing abstraction (or metaphorical category) associated with the base. Perhaps the most striking evidence for this claim is Bowdle's (1998) study showing 'in vitro' conventionalization. After seeing novel bases in parallel comparisons with three target terms in simile form, subjects preferred to express further statements involving that base in metaphor form. They also (mis) recalled the statements they had seen as having been in metaphor form. Gentner and Bowdle (2001) found that as figurative statements became increasingly conventional, there is a shift in people's preference from the simile form to the metaphor form.

A second explanation for the subjective differences in perception of similes and metaphors was recently offered by Aisenman (1999). She extended Gentner's (1988; Gentner & Clement, 1988) distinction between attributional and relational comparisons and suggested that people primarily use the metaphor form to highlight common relations between the base and target, and the simile form to highlight common attributes (Aisenman, 1999). Thus, the metaphor form is likely to convey a deep common system of relations. This theory fits well with the intuition that metaphors often seem more profound than similes. In her study, Aisenman presented subjects with base and target terms and asked whether they would be more likely to put sentences with those terms in simile or metaphor form. When the base and target shared mostly surface attributes (e.g., *The sun is (like) an orange* – both are round and orange), participants preferred to state sentences in simile form. When the base and target shared common relational structure (e.g., *Television is (like) a magnet* - both attract), participants were more likely to use the metaphor form. Aisenman's results suggest that the metaphor form is preferred for relational commonalities.

There are thus two accounts for form differences in figurative language: metaphors tend to be preferred over similes (a) when the base is conventional or (b) when the interpretation is relational. To compare these accounts, we varied both factors – conventionality of the base and the type of commonalities between the base and target – and obtained people's preferences for stating figurative expressions in simile or metaphor form.

Experiment 1. Context Priming

We selected 20 metaphors from prior metaphor studies (Ortony, 1979; Gentner & Clement, 1988; Aisenman, 1999). The metaphors used were classified as double metaphors (Gentner & Clement, 1988) in that they permitted both attributional and relational interpretations. We presented subjects with short paragraphs describing the target, focusing either on its attributes or on its relational structure. Examples of relational and attributional contexts are listed in Table 1. Then, participants were asked to choose which of the two figurative sentences they preferred. Both sentences featured the target coupled with the same base and differed only in that one of them was a simile and one was a metaphor. Half the bases were novel, and half were conventional. Conventionality of the base was operationalized as having the metaphoric meaning listed in the Merriam-Webster Collegiate dictionary. The base terms never appeared in the contexts preceding the simile and metaphor statements. Table 1 shows a sample stimulus with a conventional base.

The Career of Metaphor account predicts that people would be more likely to prefer the metaphor form for statements with conventional rather than novel bases. Aisenman's Relational Precedence hypothesis predicts that people would be more likely to prefer the metaphor form when given the paragraph priming the relational interpretation.

Method

Sixty-four Northwestern University undergraduates were presented with 20 short paragraphs. Each paragraph supported either an attributional or relational interpretation of a figurative expression. After reading the paragraph, participants chose between simile and metaphor forms as shown in Table 1 and were asked to choose the sentence they preferred by circling it. Four

random orders were used across participants. Whether the sentence in simile or metaphor form was presented on the left side of the page was counterbalanced.

Table 1: Example of attributional and relational contexts

Conventional base	
Attributional interpretation:	
Mr. White, a sociologist, is writing an article about poverty in urban America. He considers poverty a horrible blight on our society and argues that the government must intervene with a welfare reform. He thinks that	
Poverty is a disease.	Poverty is like a disease.
Relational interpretation:	
Mr. White, a sociologist, is writing an article about poverty in urban America. He considers poverty to be increasing and argues that, unless the government intervenes with a welfare reform, poverty will spread further. He thinks that	
Poverty is like a disease.	Poverty is a disease.

Results

We computed the number of metaphor choices by coding preference for simile form as 0 and preference for metaphor form as 1. Analysis of variance performed with base conventionality and context type as between-subjects factors showed a significant effect of base conventionality ($F_{1, 39} = 7.50$, $MSE = 0.31$, $p < 0.01$). The proportion of metaphor form choices was significantly higher for statements with conventional bases ($M_C = 0.39$) than for statements with novel bases ($M_N = 0.22$). The number of metaphor preferences was significantly lower than chance for both novel and conventional bases ($p < 0.05$).

We also obtained a marginally significant effect of preceding context type ($F_{1, 39} = 3.66$, $MSE = 0.15$, $p = 0.06$). Statements following relational contexts were preferred in metaphor form more often than statements following attributional contexts ($M_R = 0.37$, $M_A = 0.24$). The number of metaphor preferences was significantly lower than chance for both relational and attributional contexts ($p < 0.05$). The results are summarized in Figure 1.

The preference for metaphoric form for relational information was only marginally significant. However, an item analysis indicated a disparity in the quality of the items used. Some items were strongly preferred in simile form (e.g., only one out of 64 participants chose to put *Titanium chips are (like) diamonds* in metaphor form). It thus seemed possible that not all the items were suitable as metaphors. To ensure that the Relational Precedence view was fairly tested, we removed items that were put in metaphor form by less than seven participants (2 with novel bases and 2 with conventional bases). An ANOVA performed on the remaining items yielded a significant effect of context type ($F_{1, 31} = 5.10$, $MSE = 0.16$, $p < 0.05$) in addition to the significant effect of base conventionality ($F_{1, 31} = 10.15$, $MSE = 0.32$, $p < 0.01$). The interaction between base conventionality and context type was not significant.

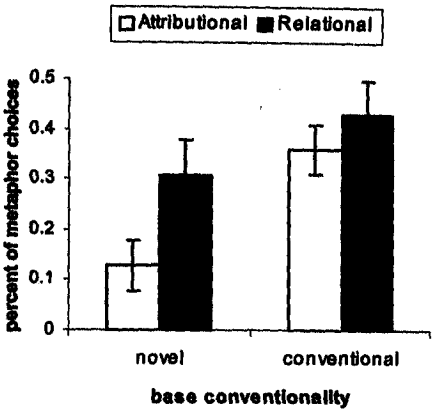

Figure 1: Proportion of metaphor choices for novel and conventional bases. Error bars show standard error.

Experiment 2

The results of the first study offered support for both the Career of Metaphor account – in which the metaphor-simile distinction is one of conventionality – and the Relational Precedence hypothesis. However, one concern here is to what extent the results simply reflect the nature of the materials. First, although the figurative expressions used in Experiment 1 allow both relational and attributional interpretations, it is possible that people may prefer one kind of interpretation over the other. Previous studies have demonstrated that people find relational interpretations of figurative expressions more interesting and apt (Clement & Gentner, 1988). Second, and more importantly, it is possible that the conventional metaphors we used were biased in favor of either relational or attributional interpretations, relative to the novel metaphors.

To calibrate the materials, we gave the figurative expressions used in Experiment 1 to a new group of participants, either in simile or metaphor form, and asked the participants to rate how much they agreed with the relational and attributional interpretations. Both interpretations were shown together for each figurative statement, but participants rated each

separately. Thus they were free to assign high or low ratings to both the relational and attributional interpretations if they chose.

Method

Thirty-two Northwestern University undergraduates were presented with 28 statements: 20 figurative statements taken from Experiment 1, and 8 fillers. The statements were blocked so that each participant saw either all statements in simile form or all statements in metaphor form. Two random orders were used. After each statement, a relational and attributional interpretations of the statement appeared. The order of the interpretations on the page was counterbalanced. The participants were asked to rate how much they agree with each of the interpretations on a 1 to 7 scale.

Results

We computed the scores for the relational and attributional interpretations for each item. Table 2 shows mean ratings for each of the four item categories, along with the number of relational and attributional interpretations that received ratings of 4 or greater (out of 7). Consistent with prior research, relational interpretations are preferred over attributional interpretations overall (Gentner, 1988; Gentner & Clement, 1988).

The key question for our purposes is whether the materials were skewed such that conventional metaphors had more or better relational interpretations than the other categories. This does not appear to be the case. Relational interpretations received high ratings (4 or above) for 8 out of 10 items in each of the four item categories -- conventional metaphors, novel metaphors, conventional similes, and novel similes. (Attributional interpretations were rated lower overall, as shown in Table 2.) It appears that the intended relational interpretations were highly apt for both metaphor and simile forms. These data offer some reassurance that the shift towards relationality in metaphor preference was not simply determined by disproportionate availability of relational interpretations for metaphors over similes.

We also created a relational preference score (Rpref), which was the difference between the relational rating and the attributional rating. An analysis of variance with base conventionality (novel or conventional) and grammatical form (simile or metaphor) as between-subjects factors revealed no significant differences in relational preference scores ($F_{3,\ 636} = 1.25$, $MSE = 13.07$, $p < 0.3$).

Table 2. Mean interpretation ratings and number of interpretations that received high ratings (in parentheses)

	Attributional	Relational
Conventional		
Metaphor	3.81 (5)	4.95 (8)
Simile	4.35 (6)	4.74 (8)
Novel		
Metaphor	3.68 (4)	4.51 (8)
Simile	3.81 (4)	4.78 (8)

Discussion

As predicted by the Career of Metaphor hypothesis, participants in Experiment 1 were likely to choose the metaphor form for figurative statements with conventional bases, and the simile form for those with novel bases. Aisenman's Relational Precedence hypothesis also received support: the metaphor form was chosen more often for relational meanings (i.e., following a relational context) than for attributional meanings (following an attributional context).

Might both claims be true? Some intriguing possibilities arise if we consider the implications of these two patterns taken together. Suppose that, as in the Career of Metaphor hypothesis, nominal figurative expressions are initially phrased as similes. As these expressions become conventionalized, the metaphor form becomes more felicitous. Suppose further that relational meanings of novel bases have more potential to get conventionalized. Then we would find a preponderance of relational meanings among conventional bases. An informal survey of the literature using conventional metaphors suggests that most of them do convey relational meanings. For example, the metaphors used by Ortony (1979) and by Glucksberg and Keysar (1990) are primarily relational (e.g., *Cigarettes are time bombs*; *Some jobs are jails*; *Sermons are sleeping pills*). Assuming that these stimuli are roughly typical of conventional metaphors, we might speculate that there is a preponderance of relational figuratives within the class of conventionalized metaphors. How might such a link between relationality and conventionality have come about?

One possibility is that different forms are used for conventionalized relational and attributional figurative statements. English has a special form for conventional bases that is often used for property attribution – "*as X as Y*," where X is the shared attribute, and Y is the base term – for example, *as white as snow*; *as strong as an ox* (Ortony, 1979). Perhaps conventional attributional meanings are siphoned off by this dedicated form.

However, relational adjectives can enter the *as X as Y* frame as well (e.g., *as delicious as an apple; as fierce as a tiger)*. The only requirement for the descriptor X seems to be that it be orderable on some dimension. Thus a possible special form for attributive figuratives does not seem like a viable explanation for the preponderance of conventional relational metaphors.

Another possibility is preemption by existing terms. Over the course of development, languages have developed names for attributes, which preempt the creation of new ones (Clark, 1992). On this account, creation of attributional metaphoric meanings might be less likely simply because we already have names for attributes. However, this explanation carries the hidden assumption that the number of attributes we want to express is smaller than the number of relations.

This brings us to the third and most speculative possibility. There is evidence that (1) people find shared relational structure more interesting or important than shared attributes; and that (2) relational meanings are relatively slow to emerge in cognitive development (Gentner & Rattermann, 1991; Halford, 1993) and arguably in the history of science. Applying this to the evolution of metaphor suggests that new relational abstractions are more likely to become entrenched than attribute meanings. Coherent relational systems are likely to be preserved in comparison processing, and this may carry over into the conventionalization of meanings and the formation of new categories (Gentner & Bowdle, 2001; Ramscar & Pain, 1996; Shen, 1992). On this account, a simile that expresses shared relational structure is more likely to give rise to parallels than one that expresses an attributional likeness. This would lead to differential likelihoods of conventionalization for relational and attributional figuratives.

Some evidence for this account can be obtained from studies of word meaning extension over time. One of the ways one can extend the meaning of a word is by analogy. For example, words like *bridge* and *sanctuary* initially had only concrete meanings, but now can denote metaphoric categories such as *something connecting two points* and *a safe place*, respectively. Table 3 shows the timeline of the first occurrences of the literal and figurative meanings of *sanctuary*, as listed in the Oxford English Dictionary, as well as other sample occurrences. (All senses are written exactly as in the OED.)

For *sanctuary*, the literal meaning of a holy building appears in 1340. Extensions to the church or the body of believers also appear in the 14th century. The first figurative usage appears two centuries later, in 1568. Interestingly, the first figurative use is signaled by an explicit comparison phrase "counted as a sanctuary". The first 'metaphorical' occurrence, unmarked by a comparison phrase, occurs considerably later, in 1685.

Table 3. Timeline of occurrences of literal and figurative meanings for *sanctuary*.

[Initial literal meaning]
I. a holy place – a building or place set apart for the worship of God or of one or more divinities: applied, e.g., to a Christian church, the Jewish temple and the Mosaic tabernacle, a heathen temple or site of local worship, and the like; also *fig.* To the church or the body of believers

1340...*in that sanctuary oure lord sall be kynge...*
1382 *And thei shulen make to me a seyntuarye, and Y shal dwelle in the myddil of hem.*
1530. *Sanctuarie, a place hallowed and dedicate vnto god.*

II.a – a church or other sacred place in which, by the law of the medieval church, a fugitive from justice, or a debtor, was entitled to immunity from arrest. Hence, in a wider sense, applied to any place in which by law or established custom a similar immunity is secured to fugitives.

1374 *To whiche Iugement they nolden nat obeye but defendedyn hem by the sikernesse of holy howses, that is to seyn fledden in to sentuarye.*
1463-4 *Eny persone..that shall dwelle or inhabit within the Sayntwarie and Procyncte of the same Chapell.*

[First figurative meaning]
1568 *Vsing alwaise soch discrete moderation, as the scholehouse should be counted a sanctuarie against feare.*

[First unmarked figurative meaning]
1685 *My house is your Sanctuary, and here to offer you violence, wou'd prejudice myself.*
1770 *The reformation was preceded by the discovery of America, as if the Almighty graciously meant to open a sanctuary to the persecuted in future years...*

Table 4. Timeline of occurrences of literal and figurative meanings for *bridge*.

[Initial literal meaning]
I. A structure forming or carrying a road over a river, a ravine, etc., or affording passage between two points at a height above the ground.

c1000 *theos brycg*
1131 *Men weorth on adrencte and brigges to brokene.*
c1449 *The brigge of Londoun.*
1660 *This was so severe a bill upon the Women, that, if a bridge was made from Dover to Calais, the women would all leave this kingdom.*

[Figurative]
1225 *The beoth ouer thisse worldes see, uppen the brugge of heouene.*
1742 *Faith builds a bridge from this world to the next.*
1863 *The bridge for thought to pass from one particular to the other.*
1874 *Gestures... forming the bridge by which we may pass over into spoken language.*

The pattern for *bridge*, shown in Table 4, is similar. The first literal meaning of *bridge* as a structure affording passage between two points above the ground goes back to the 11th century. However, the figurative

uses are not listed until the middle of the 18th century, except for a single reference to the bridge of heaven (which may have been meant literally) in 1225.

These patterns suggest that, at least in some cases, the more abstract, figurative meanings appear later in written language. In both cases, these figurative meanings are relational in nature. Interestingly, at least for *sanctuary*, the derived category no longer seems metaphoric; it has become a literal sense.

We suggest that the Relational Precedence account and the Career of Metaphor account may both be operative in the evolution of metaphor, and that they interact. Beginning with a pool of novel figuratives, the Career of Metaphor hypothesis states that for some of these the base term is repeatedly used in parallel comparisons, so that a conventional abstraction becomes associated with the base. What we suggest is that figurative expressions that yield coherent relational systems are most likely to be found novel and useful. Their bases are thus most likely to be reused and thereby conventionalized. For example, the simile *The cloud is like a marshmallow* elicits common attributes of the target and base, such as fluffy and white. But the potential abstraction 'white and fluffy' is unlikely to become a conventionalized word sense, both because of lexical preemption (we already have words for white and fluffy) and because the category it suggests is simply not very interesting. (Indeed, the conventional use of marshmallow as a metaphor is relational, as in *That boxer turned out to be a marshmallow.)*

Metaphors are a source of polysemy in language – they allow words with specific meanings to take on additional, related meanings (e.g., Glucksberg & Keysar, 1990; Lakoff, 1987; Lehrer, 1990; Miller, 1979; Murphy, 1996). We suggest that mappings that focus on relational structures are more likely to generate stable abstractions than mappings that focus on object attributes. In sum, conventionalization of relational meanings may fulfill an important cognitive function in creating new abstractions.

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