Discussion

Reasons to doubt the present evidence for metaphoric representation

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In his reply to my article, Raymond Gibbs provides further information about the thinking underlying claims for metaphoric representation. As he points out, I was not able to review some of the theoretical rationale underlying claims for metaphoric thought, such as the issue of embodiment. He also describes further empirical evidence for the notion of metaphoric concepts. To summarize my rebuttal, I will argue that the empirical evidence Gibbs cites is not very conclusive in supporting metaphoric representation. Furthermore, the problems with linguistic evidence remain in spite of his defence. Much of the problem is that the notion of metaphoric representation is too vague at this point to be empirically confirmed or disconfirmed. However, I agree with Gibbs that the idea that parts of a concept must be completely consistent is likely not to be fully correct, and I conclude that further work is necessary on this question.

One topic I won't discuss in much detail is that of embodied cognition. Gibbs points out that theories of metaphoric cognition have often referred to underlying bodily processes and experiences in order to explain why we have some metaphors rather than others. (This cannot be the basis for all metaphors, since some of them, like LOVE IS A FINANCIAL TRANSACTION, are not very bodily – in fact, love is much more embodied than financial transactions are.) Although the notion of embodiment is an interesting one, it is not an empirical finding, but is itself a theory that does not yet have wide acceptance. I for one am not sure how bodily sensations of containment, say, can be extended to understand abstract containment relations such as text being in a book, or an object being in a category (Lakoff, 1993, p. 212). In any case, I think that the argument from embodied cognition must await further development of this theory.

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1. Empirical evidence

Gibbs provides further examples of studies that he feels support the claim for metaphoric thought. My reaction to much of this work is similar to what I said in my earlier article, so I won't respond on a point-by-point basis here. I do wish to raise two more general concerns, however. An empirical test of literal and metaphoric theories of cognition requires that both the literal and metaphoric views be articulated well enough to permit comparison. I will argue in this section that both of these prerequisites have often been missing from the metaphoric cognition literature.

The first point is that much of the writing supporting metaphoric concepts does not consider a plausible nonmetaphoric alternative hypothesis. Findings that people use metaphors in describing some domain or that providing a metaphor to subjects changes their behavior are sometimes taken as direct support for a metaphoric thought process. The possibility that literal concepts could be influenced by the same manipulations is not always considered. When a non-metaphoric process is described, it is often not developed in as much detail as the proposed metaphoric account. This can be seen in Gibbs's reply to my discussion of polysemy. As he points out, Sweetser (1990) has argued for a metaphoric explanation of the historical development of polysemy. However, although it seems possible that a nonmetaphoric alternative explanation of these phenomena could be proposed and tested, there is none clearly delineated in Sweetser (1990) or in Gibbs's reply[1].

A related problem in having an argument about literal versus metaphoric processes is that it is often the case that one specific literal account is pitted against the general claim of metaphoric processes. For example, Gibbs argues against the view that polysemy can be accounted for by monosemy, or "abstract features or relations of similarity that underlie all the different senses of a polysemous word." I agree completely that this view is unlikely to be true. But there are many possible accounts of polysemy besides this one that do not refer to metaphoric meanings (see Cruse, 1986; Nunberg, 1979; Rice, 1992). My own work has investigated the possibility of chains of similarity that can motivate extended meanings (Murphy, in press), as *rise* has been extended from a physical use to a related abstract use (e.g., *Inflation is rising*, discussed in my original article). For example, in one experiment I taught subjects the core meaning of a word (e.g., the name of a tool) and an extended use of the word (e.g., a verb meaning to use the tool in a certain way). Then I asked subjects to judge the acceptability of a third use of the word that was either similar or dissimilar to the extended use they had previously been exposed to. I found that subjects were more willing to accept the third use of the

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[1] I should point out, though, that I find Sweetser's explanation of polysemy completely in keeping with a notion of how literally similar meanings might become encompassed by the same word over time. That is, her analysis of polysemy seems quite plausible to me – I simply do not find anything metaphoric about it. However, she does not develop an alternative that *she* identifies as nonmetaphoric in any depth.

word when it was similar to the extended meaning they had seen than when it was dissimilar. (Through counterbalancing, this third usage was equally similar to the ''core'' meaning in the similar and dissimilar condition – see Murphy, in press, for details.) Thus, I argued that it was not a single abstract or core meaning that determined how people would extend words (i.e., I argued against monosemy), but in part how similar the new use was to familiar uses (see also Malt, 1994).

My purpose here is not to promote my own theory of polysemy, but simply to point out that articles on metaphoric representation often do not develop such plausible nonmetaphoric theories for comparison. My view is quite different from the monosemy view that Gibbs criticizes and that is argued against by Lakoff and Johnson, 1980, Ch. 18. So I would certainly not expect anyone to accept the monosemy theory of polysemy ''as a matter of faith'' as Gibbs puts it, as I do not accept that particular view at all, much less as a matter of faith. More generally, there is a danger in setting up one particular theory as ''the'' nonmetaphorical view of X, as there are bound to be a number of different nonmetaphoric theories of any given question. However, even this situation is preferable to one that sometimes occurs, in which no (reasonable) nonmetaphoric view is considered at all.

The second half of the comparison of literal and metaphoric concepts is a detailed model of metaphoric thought. Gibbs points out various pieces of evidence that people use metaphoric concepts. But what exactly are these concepts? How are they structured? How is the metaphor used in behavior, and how do people choose among different possible metaphors on any given occasion? Without answering these questions, it simply isn't clear that there is a metaphoric model of concepts that can explain the data from all the studies that are said to support this general view.

One can contrast this situation with a number of literal models of concepts. For example, consider exemplar models of concepts, the idea that people represent concepts in terms of instances rather than more general representations. There are a number of very well-specified models of this sort, the most recent of which are instantiated in computer models (for a selection, see Anderson, 1991; Brooks, 1987; Estes, 1994; Hintzman, 1986; Kruschke, 1992; Medin and Schaffer, 1978; Nosofsky, 1988). These models describe explicit representational assumptions, provide mechanisms for learning, and often describe process models of exactly how categorization is achieved. I am not endorsing these models – in fact, I have often pointed out their limitations (Murphy, 1993a,b). But one clear advantage they have is that it is clear what each model is and what it predicts. In fact, it is this clarity that has permitted critics of exemplar models to point out their limitations.

As another example, consider the finding of a basic level of categorization (Rosch et al., 1976; see Murphy and Lassaline, in press, for a review). This is the finding that within a category hierarchy, some concepts are preferred in thought and communication. For example, there is an object in my office that most people call a *desk*, and very few call *furniture* or an *office desk*. The advantage of concepts like *desk*, *dog*, *tree*, or *hammer* over more general and more specific

categories is well known. Explanations of this advantage have developed fairly explicit assumptions about how these categories are represented (Murphy and Brownell, 1985; Rosch et al., 1976; Tversky and Hemenway, 1984), and specific process models of categorization have been constructed and tested (Lassaline et al., 1992; Murphy, 1991b; Murphy and Smith, 1982). For example, it now seems fairly clear that the similarity structure of basic categories is different from more specific (subordinate) and more general (superordinate) categories: Basic categories have much greater within-category similarity than superordinates do; however, they are more distinctive (i.e., more different from one another) than subordinates are. Experiments have shown that these aspects of category structure are directly related to the basic-level advantage in performance (see Murphy and Lassaline, in press). Furthermore, research on the basic level has implications for naming, reference and other aspects of language use, but the theory of basic-level categories can be supported independently by nonlinguistic sources of evidence (Murphy, 1991a), avoiding any circularity.

The point of these examples is to contrast two well-known domains of research in the concepts field with metaphoric models of concepts. In my view, there is no single well-defined model of metaphoric concepts in the literature that can match the specificity of these theories. As the originators of this view were not experimental psychologists, this may not be surprising, or even seem to be a fair comment to make. But when claims about conceptual structure are made, and psychological experiments are cited as supporting the view, such concerns become important. Any theory of conceptual structure needs to spell out in detail exactly what a metaphoric concept is, and how it operates in any given task. The metaphoric representation view has not yet made much progress in this direction. When talking about my critique of metaphoric concepts in seminars and private conversations, I found that psychologists who were familiar with the writing on metaphoric cognition had extremely different ideas about exactly what the metaphoric concepts were. Were they the only concepts? Were they subordinate to the ''real'' concepts? Were they a kind of interface between the literal conceptual base and behavior? Could concepts initially be metaphoric and then develop into literal concepts – or vice versa? Audience members in seminars often raised such questions but then differed among themselves on what the ''correct'' answer for the metaphoric representation view was. This may well in part reflect a lack of detailed attention to the literature on the part of such audiences, but I believe that it also reflects the fact that the proposals of models of metaphoric thought have simply been too vague.[2]

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[2] For example, the interesting proposal that Gibbs makes about distinguishing temporary conceptualizations from knowledge is not clearly found in any other account of metaphoric representations to my knowledge. It may be consistent with others' notions of metaphoric concepts (e.g., perhaps this is similar to Lakoff's (Lakoff, 1993) Invariance Principle), but those notions are not specified in enough detail to be sure. Before evaluating such a proposal, I would like to know how the metaphoric conceptualizations are represented, how they are accessed and coordinated, how the nonmetaphoric knowledge is stored, how it interacts with the metaphoric conceptualizations, etc. It may well be that a perfectly adequate story of conceptual structure can be told here, but this story has yet to be written.

So, although there may be empirical evidence that I have not given sufficient attention to, my argument is that empirical evidence can only support a model that is well specified enough to make clear predictions. So far as I know, the great mass of data on concepts published since Rosch's early discoveries (data on categorization, concept learning, concept discovery, typicality judgments, induction, and so on) have not yet been accounted for by this view, and it is not entirely clear what the model would say about these data, because of uncertainty about what metaphoric concepts are really like.

2. Linguistic data

In his reply, Gibbs defends the use of primarily linguistic data. I won't repeat most of my concerns here, but I will try to clarify my objection. As Gibbs points out (in footnote 1), much mainstream research on concepts has used linguistic materials. However, this is not linguistic *evidence* of the sort I criticized in my article. The dependent measures of studies of concepts include category learning and formation (e.g., Kruschke, 1992; Nosofsky, 1988; Spalding and Murphy, 1996), induction (Gelman and Markman, 1986; Malt et al., 1995; Osherson et al., 1990), typicality (Barsalou, 1985), categorization decisions (Rips et al., 1973; Rosch et al., 1976) and so on. My point is not that *materials* should not be linguistic but that the evidence should include more of these different aspects of concepts. A central point of my article is that the linguistic evidence by itself is dubious, because it assumes that a certain pattern in speech directly reflects conceptual structure. Many of the findings in the mainstream concepts literature have been replicated with categories represented by familiar words, with artificial nonlinguistic stimuli, and with novel verbal stimuli. There are no major principles in the field (that I can think of) that rely only on evidence from verbal materials, much less from linguistic phenomena per se.

Gibbs does not quite represent my objection when he says – in apparent disagreement with me – that "it is important to ask why it is that people talk about the world and their experiences in the way they do." I couldn't agree more! This is one of the most important questions in cognition. However, it seems to me that we are still very much at the stage of *asking* this question. Taking verbal metaphors and idioms as evidence about conceptual structure is assuming a particular answer to the question – an answer that is not yet well supported in my view.

Finally, I must say that I am surprised at the claim that "people generally can't understand talk about journeys in terms of love for the important reason that we don't generally think about journeys in this way." It seems to me that the simple metaphor "A journey is like a love affair" is perfectly understandable, and an extended metaphor mapping out the similarities could be quite rich. No particular evidence is given for this claim, so I assume that the evidence is that people do not *talk* about journeys in terms of love (as much as vice versa), but of course, this reasoning begs the very question under dispute: whether such linguistic evidence directly reflects conceptual structures and thought.

3. Idioms

One domain that receives considerable attention in Gibbs's remarks is that of idioms, an area in which he has done much interesting work. He argues that neither historical convention nor the literal meanings of the idioms can explain why they have the idiomatic meanings they do. Again, I cannot really review all this work in the space available, and so I won't engage in a detailed debate here. However, I will point out that in addition to the more positive cases that Gibbs cites are many kinds of idioms that are less susceptible to a metaphoric interpretation, such as ungrammatical, unanalyzable idioms like *by and large*, or opaque idioms like *kick the bucket*. There is no larger conceptual metaphor of KICKING AS DYING or BUCKETS ARE DEATH that would explain this idiom. Thus, many idioms must be explained by historically opaque conventions, on any account.

The area in which the metaphoric and literal cognition views disagree is in how to explain those idioms that are at least partly analyzable, like *spill the beans* or *flip one's lid*. Perhaps such idioms partake of more general metaphoric concepts, like ANGER IS HEATED FLUID IN A CONTAINER. This now becomes a complex empirical question, which is currently receiving active debate in the field. I won't review the debate here, except to say that I think that it is possible that much of the data Gibbs raises could be accounted for by the structural similarity model I suggest, applied to the literal meanings of the idioms. For example, there seem to be important similarities between the literal meaning of *spill* and its idiomatic meaning "to reveal" (a secret): The beans are spilled by mistake, suddenly, and are ruined as a result; the secret is suddenly revealed by mistake and is thereby spoiled. Whether such literal similarities can describe all the cases that Gibbs describes is an ongoing question in the field.

4. Conceptual consistency

I think that the strongest point that Gibbs makes is his argument that concepts may not be entirely consistent entities that fit together like a jigsaw puzzle. I had argued that it is hard to understand how the different metaphors for a given domain could be structuring the same concept, because the concept of *love* one gets from LOVE IS A FINANCIAL TRANSACTION is so different from the concept one gets from LOVE IS INSANITY. I think that both of us may be right (or wrong) here. I must admit that I am uncomfortable in assuming that there is exactly one concept for *love*, and that all its parts are consistent. Especially for very abstract or complex concepts, this seems unlikely. Yet, it seems to be equally unlikely that radically different metaphors for the same entity can structure the same concept regardless of what conflicts they may engender. There is considerable evidence that people find it easier to learn concepts when their properties are consistent with one another and with more general knowledge (see Murphy and

Allopenna, 1994; Pazzani, 1991; Spalding and Murphy, 1996; Wattenmaker et al., 1986). It is difficult to believe, then, that different metaphors can represent the same concept regardless of how much they conflict.

Thus, I feel that the structure of abstract categories is something that neither theory yet has a very good explanation for. It may be that some combination of the two will be necessary – or that something quite different from any present proposal will be necessary.

5. Asymmetry and similarity

In his discussion of the directionality issue – why some metaphors occur in one direction and not others (e.g., LOVE IS A JOURNEY but less often, A JOURNEY IS LOVE) – Gibbs points out that my mention of typicality as a cause of directionality would not explain why people think of love in terms of journeys rather than vice versa. Perhaps I placed too much emphasis on typicality as a determinant of directionality in my article. As my example of Michael Jordan and the college basketball player illustrates, it is not just typicality (in the sense of central tendency of a category), but also salience or symbolic status that are factors. Michael Jordan is hardly typical of basketball players in general, but he is an extremely salient example, who also represents an ideal. Such variables tend to create imbalances in similarity judgments (Tversky, 1977). Furthermore, it is clearly not in question that people prefer to talk about love more than about journeys, which is another reason for there being more metaphors about love than about journeys. I was not attempting to provide an account of all the causes of such directionality. My point was that before arguing that asymmetry in verbal metaphors requires a metaphoric concept in order to be explained, one should be sure that the other causes of asymmetry, *which are already firmly established empirically*, are not responsible.

I might also point out here that some of Gibbs's comments that metaphor cannot be reduced to similarity are not fully relevant to the structural similarity view I describe. For example, the Camac and Glucksberg (1984) paper he mentions shows that the vehicle and topic of a novel verbal metaphor need not be lexically associated independent of the metaphor. Camac and Glucksberg used lexical priming as their measure of relation – their article did not examine structural similarity. Also, I should perhaps emphasize that structural properties that one might notice in understanding a metaphor could well be much less salient in other situations. So, in a metaphor like *encyclopedias are gold mines*, the aspects of the two domains that correspond may not be salient independent of the metaphor. It is the attempt to find correspondences between the two that highlights certain properties and relations as being the basis for a metaphor. This claim is one that holds for similarity judgments in general (Medin et al., 1993) – it is not one cooked up just to explain metaphoric similarity.

6. Conclusion

I would like to close by again making an appeal for more specific models of metaphoric concepts. Gibbs ends his reply by asking that cognitive psychologists actively test for the possibility of metaphoric representations in the domains of their interest. This would certainly be helpful, but it is not yet entirely clear to me how to design such tests. Until there are some specific models of metaphoric concepts, it will be difficult to know whether they can explain findings of apparent metaphoric thought, as well as the usual evidence regarding conceptual structure. The use of linguistic evidence has not required such specific models, because this evidence primarily involves the production or comprehension of metaphors, which have been taken as direct evidence for underlying (metaphoric) conceptual processes. The study of metaphoric cognition is indeed in its youth, and so I recognize that it is unrealistic to demand a complete computational model at this stage. However, any theory of concepts and thought will require a falsifiable model, even if it is a simplified, incomplete one, so that its successes and limitations can be accurately assessed.

Finally, I'd like to note that if all such exchanges on this topic were as constructive as Gibbs's reply, I believe that the result would be a better understanding of conceptual structure. I think that both proponents and critics of metaphoric representation have sometimes treated this controversy as being a matter of faith rather than an empirical question, and Gibbs's reply is certainly free of that problem. If this debate leads to further empirical investigation of these issues, then it will have helped to further our understanding of concepts.

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