

Metaphor and Cognition: An Interactionist Approach

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Bipin Indurkha has written a wide-ranging and interesting work that is easy to read. Although Indurkha's starting point is the puzzle of similarity-creating metaphors, the book is really about cognition and conceptual structure. In particular, he is concerned with the philosophical problem of reconciling the constructive nature of our concepts with the notion of a pre-existing mind-independent structure of reality. While the book covers a great deal of ground and is well worth reading, I feel that the basic theory is flawed in that it rests on a common philosophical view of meaning that has been considered inadequate.

1. Outline of the Book

In Chapter 1, Indurkha gives his characterization of metaphor, examines examples, and relates metaphor to models, analogies, and similes. Metaphor is "an unconventional way of describing (or representing) an object, event, or situation (real or imagined) as another object, event, or situation" (p. 36). In Chapter 2, he examines several examples of *similarity-creating* metaphors, and claims that no existing account has adequately explained how metaphor creates similarity. He concludes that the creation of similarity is a cognitive problem: "How is it that an object can be conceptualized differently, with new attributes and structures being created, but this creation is not arbitrary?" (p. 90). Accordingly, in Chapter 4, he considers a view of cognition, the interaction view, that attempts to answer this question. The paradox of interactionism, in his view, arises from maintaining both that the attributes and structures a cognitive agent uses to conceptualize its environment can be created differently, and that this creation is not arbitrary but somehow constrained by an environment that does not have a pre-existing structure. Indurkha concludes that neither the philosophical tradition from Kant to Goodman, Piaget's constructivism, nor Lakoff and Johnson's experiential view adequately resolves this paradox.

These first four chapters constitute part I of the book, "The Problem." In Part II, "A Theory," Indurkha reveals his interactionist approach to cognition (Chapter 5), gives a formal characterization of this theory (Chapter 6), and develops his theory of metaphor (Chapter 7). I will discuss these chapters more fully below. Part III of the book, "The Implications," applies his theoretical framework to other concerns surrounding metaphor. Chapter 8 examines issues including the claim that all language is metaphorical, the truth-status of metaphor, and the aptness of metaphor. Chapter 9 looks at predictive analogies and induction and argues that these processes

can be misleading. Chapter 10 gives an overview and critique of various computational approaches to metaphor and analogy from the point of view of Indurkha's theory.

2. The Theory

In Chapter 5, Indurkha distinguishes three levels of reality to resolve the paradox of interactionism. The first is a *God's-eye view* of reality, which cannot be known by the cognitive agent but which possesses a mind-independent autonomous structure. A cognitive agent can interact with this level of reality through its sensory and motor apparatus, and through this interaction may partially receive evidence of the autonomous structure of reality. The second level of reality is the sense impressions that are made available for conceptualization through the sensorimotor apparatus of the cognitive agent. Indurkha calls this the *sensorimotor data set*, and he maintains that while the make-up (or 'ontology') of this data set is determined by the biological form of our senses and motor apparatus, the patterns of stimulus perceived are determined by the structure of the external world. The third level of reality is defined to be the conceptual level, what Indurkha calls the *environment*.

The environment consists of both internal representations of the cognitive agent, called *concept-networks*, and *cognitive relations* that connect concepts in the concept-networks with parts of the sensorimotor data set. Indurkha maintains that the concept-networks, which consist of structured sets of symbols and operators, are purely syntactic systems that are meaningless until they are associated or 'instantiated' with the sensorimotor data set. An instantiated concept-network is called a *cognitive model*. Indurkha explains that it is beyond the scope of his book to address the question of how these concept-networks come about, but these networks might be either learned, derived from another existing network, or inherited genetically. The cognitive relation is a correspondence between the *symbols* and *operators* of the concept-network, and the *objects* and *transformations* of the environment, respectively. A key part of Indurkha's scheme is that the same concept-network can have different mappings to the same set of sense-data, thus creating different environments.

Some cognitive relations possess what he calls *coherency*. This means there is an isomorphism between the structure of the concept-network and the environment. Since coherent cognitive models are the most useful for a cognitive agent in making predictions about the environment, Indurkha introduces two cognitive mechanisms to keep cognitive models coherent. The first mechanism, *accommodation*, restructures the concept-network to better fit the environment. The second mechanism, *projection*, keeps the current concept-network but alters its mappings to the environment; it is this mechanism that will explain similarity-creating metaphors.

Indurkha introduces an interesting example in order to explicate these notions. He supposes a simple cognitive agent named Spinner, who lives in the two-dimensional world of Flatland along with several straight lines. Spinner has a very simple sensorimotor data set: five light-sensitive cells that can also serve as an effector organ for emitting short bursts of air. The 'eye' cells and the air bursts allow Spinner to interact with the straight lines inhabiting its world. The 'God's-eye reality' consists of the lines and their orientation in the world, but Spinner can only perceive them in a limited way through its sensorimotor data set. Indurkha describes the behavior of the world as follows:

The lines love to spin around, and can often be seen dancing wildly. Spinner can also cause the line in its zone, if there is one facing it, to

spin. In fact, Spinner loves doing that (and so do the lines), so much so that over the generations 'mental structures' have evolved in Spinner that reflect its understanding of the behavior of the lines, as well as its ways of affecting this behavior. (p. 141)

The 'mental structures' that Spinner has evolved are concept-networks consisting of symbols for different visual vectors and operators that specify how one symbol can be derived from others. Once this concept-network is *interpreted by* associating it with the sensorimotor data set, the symbols of the network correspond to the objects in the environment (in this case, different visual vectors of lines), and the operators correspond to actions by Spinner or other causes that change these objects (different streams of air that cause the lines to move).

In some cases, different orientations of a line will be indistinguishable solely on the basis of the input vector from Spinner's 'eye.' But Spinner may still evolve different concepts if there is a difference in behavior. Here is a case where different concepts are mapped to the same sense-data; in other cases, one concept may 'group' two (or more) different sense-data—for example, where different actions by Spinner produce results that are indistinguishable. Indurkhya explores how Spinner adapts if its world is then changed: it has to either restructure its concept-network by creating new concepts (accommodation) or reinterpret the mapping from its current concept-network to the new sense data (projection), or both.

Indurkhya points out that a more complex cognitive system could vary the threshold of its perceptual organs. This ability for greater variation suggests similar mechanisms of accommodation and projection by which the perceptual apparatus itself creates the sensorimotor data set out of the world of things-in-themselves. Such a cognitive system may have many layers of concept-networks and mappings between them, with each successive layer representing different groupings and higher levels of abstraction. Between every layer, the mechanisms of accommodation and projection allow the cognitive agent to adjust and reinterpret one layer to another. But this restructuring is always constrained by the autonomous structure of the raw sense-data from the perceptual organs. These mechanisms explain how an object can be conceived of differently without the creation of new attributes and structure being arbitrary.

Having constructed this apparatus of cognition, Indurkhya formulates his interaction theory of metaphor in Chapter 7. Using the notion of a layered cognitive system, he defines the source or subject of the metaphor as a concept-network that is instantiated in the lower-level environment or *realm* of a different concept-network. This new realm is the target or vehicle of the metaphor. The realm of the target domain can be either a sensorimotor data set or an 'imagined' perceptual experience constructed from sensorimotor data sets encountered in the past. This imagined experience is a concept-network placed in the intermediate layers of the cognitive system. Some of the concepts of the source will have a conventional instantiation in the new realm—that is, they will correspond to the way that the cognitive agent habitually interprets the concept; but other concepts cannot be interpreted conventionally in the new realm, and the cognitive agent will have to instantiate these in a nonconventional way. Thus, metaphor is essentially a *projection* of one concept-network onto the realm of another. This explains Indurkhya's characterization of metaphor as an unconventional way of describing (or representing) an object, event, or situation (real or imagined) as another object, event, or situation.

3. Comments

Indurkha's approach is basically a logicist view of language and meaning: our conceptual schemes are formal symbol systems that only take on meaning when interpreted in sense-data; and metaphor is simply a nonstandard interpretation. Thus, as the logical positivists held, meaning is only a matter of logical syntax plus reference. Indurkha's crucial *cognitive relation*, the process whereby the concept-network is instantiated, is not defined. There is a notion of instantiation and interpretation for logical systems whereby the truth conditions of quantifiers, functions, and predicates is explicated in terms of individuals, but this does not give us a cognitive mechanism. Nor does it explain how creating a *link* between a symbol and sense-data can create meaning.

Another major drawback is that meaning is seen as internal and completely tied to each individual's senses. As Wittgenstein's (1984) argument against private language has shown, inner experiences are too subjective and unreliable to form a basis for linguistic meaning; instead, meaning must have a public element. But it is unclear how this public element or any kind of context can play a role in Indurkha's scheme. His approach is completely driven by sense-data, from the bottom up, and it is unlikely that different groupings and orderings of observables alone can account for all the complexity of our abstract concepts and schemes.

Indurkha is using the logician's sense of *model* when he insists that concept-networks are meaningless. But if these networks are totally meaningless, how does the internal structure arise in the first place, and how can it possibly correspond to perceptions of the world? Indurkha supposes the mental structures reflecting Spinner's understanding of the line's behavior have somehow 'evolved'; but if these structures come about evolutionarily through interaction with the environment, then their structure must have meaning. I have advocated elsewhere (Way 1991; Aronson, Harré, and Way, in press) that the sense of *model* for cognitive systems should be that of the scientist rather than the logician, where the relations among the parts of the model determine meaning instead of formal isomorphisms. Mental models are more than just syntactic representations, and, as I have argued, it is in virtue of the manipulation of meaningful representations that metaphor takes place.

Indurkha's book is a valiant effort to produce a unified answer to some difficult problems in metaphor, cognition, and meaning; and he has pulled together interesting and valuable research in these fields along the way. However, the basis on which he builds his theory, a logicist view of language and meaning, contains serious problems for explicating metaphor and cognition.

References

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