

Opening the Black Box on Language, Culture, and Thought

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The behaviorist era was a time of rapid accumulation of knowledge about how environmental conditions were related to behavioral responses acquired through learning. Despite the optimistic term “learning theory” for the explanations that accompanied the observations, though, the behaviorist endeavor yielded little by way of compelling accounts of what linked the inputs and outputs. The black box was eventually pried open by the dual developments of the computational metaphor of mind and experimental techniques for probing the mental representations and processes that intervened between input and output, and these changes stimulated the development of more satisfying theories.

The study of the relations among language, culture, and thought has a long history, and many fascinating observations have likewise been made about the relations between what we might call the input and output – specifically, between language and thought, on the one hand, and culture and thought on the other. But much of this work has had a distinctly black box character to it. For instance, the bulk of the extensive literature on whether the different color vocabularies of languages result in differing color perception or cognition has asked only exactly that: Suppose we look at people who speak languages that carve up the color spectrum differently; do we see differences in their behavior on a variety of color-based tasks? Similarly, work in other lexical domains has asked questions such as, If we look at people who speak languages that mark nouns for gender vs. those who don't, do we see differences in how they think about the entities referred to by the nouns? Interest in the relation between culture and thought is of much more recent vintage among cognitive psychologists, but here, too, these investigations have had a black box character. They frequently ask only whether global properties of cultures -- such as whether they are more individualist or collectivist, or have a closer or more distant connection to nature -- are reflected in the way that members of the culture respond to certain tasks.

The black box approach to these issues has without doubt contributed to the slow progress in developing a deeper understanding of the relations among language, culture, and thought. While observations pile up, little by way of theory has been offered to provide a framework for making sense of the individual outcomes taken together, or to guide the search for further information. By what mechanism(s), exactly, would characteristics of cultures as a whole exert an influence on individual cognition? By what mechanism(s) might having certain types of linguistic representations and not others shape the nature of non-linguistic representations

or processes? The lack of theory is especially surprising against the backdrop of the cognitive revolution -- by now hardly news -- and the sophisticated theories and models of mental life that have arisen not only in other domains (e.g., memory, attention, categorization) but also that link knowledge of language to thought in the service of other goals, such as understanding speech production (e.g., Levelt, Roelofs, & Meyer, 1999), word meaning (e.g., Vigliocco, Vinson, Lewis, & Garrett, 2004) or uncovering the nature of thought itself (Jackendoff, 1983). However, the challenges to developing theories are perhaps greater for the task of understanding the relations among language, culture, and thought than in other areas of cognitive inquiry, as I will discuss later.

Fortunately, the papers by Ross, Waxman & Medin, and Imai & Saalbach present steps toward a more satisfying approach to understanding the relations among language, thought, and culture. Ross directly takes up the problem of how general characterizations of culture can be linked to individual thought. He rejects traditional definitions of culture that view culture as a set of beliefs, values, customs, etc., common to a group of people. Rather, he proposes that culture be thought of as causally distributed patterns of mental representations, their public expressions, and their resultant behaviors in ecological context. This view of culture suggests that research should focus on understanding how knowledge is acquired, transmitted, and changed. As such, it encourages us to trace the distribution of patterns of knowledge and beliefs both across and within cultures in order to establish the pathways that determine how ideas affect behaviors and vice versa (Atran, Medin, & Ross, 2005). Following this approach can provide the foundation for development of models and theories that have explanatory force with regard to how culture may affect thought, and that provide the basis for guiding further research.

Waxman & Medin and Imai & Saalbach present empirical investigations in which they ask what capacities children bring to the task of acquiring knowledge, and how language and culture may shape the task they are faced with or the information they take in. Both of these investigations illustrate a point that must be taken seriously if we are to develop theories of how language and culture may influence thought. Namely, there may not be a fixed representation we can point to in trying to describe what knowledge a child (or adult) has. Imai and Saalbach demonstrate compellingly that depending on what kind of task is used to tap knowledge, different patterns of responses may occur. When a child is asked to merely to choose what object goes with another,

she may make a different choice than when asked what object shares a property with the first or what object shares the same name as the first. Given this observation, what constitutes the “concept” that the child has in that domain? (see also Barsalou, 1987; Malt & Sloman, 2006). Waxman & Medin’s data suggest the same dilemma. Strikingly, children from the US, Indonesia, and Mexico show uniformity in their judgments about what things grow and what things die. Given that growing and dying are key elements of being alive, these responses suggest that the children have similar understanding of what it means for something to be alive. On the other hand, they made substantially different judgments when asked directly about what things are alive. Do they have the same understanding of aliveness or not? There clearly is no single answer to these questions, and a model of the relations among language, culture, and thought will need to represent elements of knowledge and how they are retrieved in the service of tasks such that different ensembles of elements can be recruited in different tasks (Barsalou, 1987). The model will also need to provide mechanisms that account for which elements are retrieved under what circumstances, and when (or if) language and culture influence the retrieval process (as well as when or if they shape the underlying representations that they act upon).

The preceding observation raises another issue that will need to be resolved in order to develop theories or models. Intuition tells us that there is such a thing as a concept of “alive”, so how can we get two different answers depending on what the task is? I believe the answer is that this intuition comes about because we tend to confuse the knowledge associated with words with the contents or structure of non-linguistic representations. We often say things like “Speakers of Russian have different color concepts from speakers of English” based on the observation that the lexicons of the two languages differ in the ways they label color. That is, we talk as if a difference in the meaning associated with words is the same thing as a difference in non-linguistic representations.

But if we adopt this sense of the term *concept*, we are faced with a theoretical incoherence. This sense entails that all observed difference between languages automatically yield differences in concepts. If we take that as the relevant sense for our theorizing, there is no need for any debate about what the relation is of words to concepts, nor for any empirical evaluation of the hypothesis that language shapes thought. Yet these issues are, of course, at the very heart of the research enterprise concerning the relations among language, culture, and thought. I suggest, then, that we need to be careful to refer to the cross-linguistic differences in the knowledge associated with words in different languages as differences in *linguistic* concepts (or *semantic* concepts, or word meanings), and to test, not assume, consequences for non-linguistic knowledge content, organization, or use.

Using this terminology, the children speaking English, Tzotzil, and Indonesian in Waxman & Medin’s study may have very similar knowledge about crucial properties of

plants, animals, humans, and artifacts. What differs is the level of success they have achieved at a given age at figuring out what elements of that knowledge are associated with the English word *alive* or its approximate equivalent in the other languages. Then the answer to the question of whether the children have the same understanding of aliveness or not is simple: They have the same understanding of the nature of the entities under discussion, but they differ in their lexical competence in the domain.

But working out such details is the easy part. The real reason that developing theories and models of the relations among language, culture, and thought will be such a challenge is what else they need to contain. So much of the influence language and culture may have on thought may be exerted during childhood that capturing developmental trajectories will be essential. As Imai & Saablach’s paper illustrates, we must understand what aspects of development are malleable and what are less so. As Ross has pointed out, patterns of input must also be understood, as must the ecological context of the output measured. And as Waxman & Medin’s data indicate, the patterns of input modeled must capture not only what information is transmitted but in what linguistic forms – differing across languages – it is offered. The black box will not be flung open. It will be cracked open bit by bit. But it is time to take the pry bar and get to work.

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