Spatial Search

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A long, long line of research has investigated metaphor. For centuries, researchers in philosophy, linguistics, cognitive psychology, literature, anthropology, education, and other fields have discussed what metaphor is and how humans make sense of it. In recent years, there is consensus that metaphor is nothing magical or special. It is not in fact reserved only for poetry or literary work. Rather, it is part of all language and part of our basic conceptual system (Gibbs, 1994; Lakoff and Johnson, 1980).

Spatial metaphors are especially important to everyday thought and communication (Lakoff and Johnson, 1980). They figure into how people talk about all sorts of things the world, including time (Clark, 1973; Moore, 2014), social relationships (Matthews and Matlock, 2011), romantic love (Gibbs and Nascimento, 1996), emotions (Kövecses, 2000), politics (Lakoff, 1997; Matlock, 2012), physics (Pulaczewska, 2011), numbers and mathematics (Núñez, 2011), health and illness, especially cancer (Reisfield and Wilson, 2004), sustainability and environmental issues (Larson, 2011), and technology, including the Web and other information spaces (Maglio and Matlock, 1999).

In all these cases and more, people use their knowledge of and experience with physical space (the source domain), including motion, to structure how they talk and think about something relatively abstract (the target domain), i.e., unfamiliar, complex, obscure, or intangible. (Imagine how hard it is to talk about emotions or the web without spatial language and thought!) For instance, when early personal computer users first attempted to search for information on the World Wide Web, they naturally used spatial metaphors. This was seen, and still is today, in statements like, “I started to go to your website but decided to come back to Yahoo!” In such language, motion verbs (go, come) are used to describe information search, not actual physical motion. Nobody is actually going anywhere (Maglio and Matlock, 1999; Matlock, Castro, Fleming, Gann, and Maglio, 2014). Similarly, in talking about math, people use spatial metaphors, such as the number line, in which numbers are viewed on a left to right horizontal array, or they use a vertical schema, in which numbers are thought of as higher or lower relative to each other (e.g., “9 is higher than 7”) (see Lakoff and Núñez, 2000). And in discussing politics, people use spatial language. For instance, in talking about political candidates and their status relative to each other right before an election (Matlock, 2012; 2013), people use motion metaphors (e.g., “Obama sprinter ahead of Romney,” “The candidates are inching toward the finish line”).

Much of the research on metaphorical thought focuses on how metaphors are comprehended. Often questions have often focused on the extent to whether and how metaphors are derived from literal language, and whether metaphorical language, or more
generally, figurative language, is more difficult to interpret than literal (see Gibbs, 1994, for overview). Despite many claims about how spatial metaphors in particular are important to everyday thought, little research has been devoted to the dynamics of metaphorical thought or their utility in everyday reasoning. Is the mapping from a spatial source domain to some target domain always unidirectional, as some of the early metaphor research would have us believe? And if it is largely or entirely unidirectional, how does it work? What spatial information is carried over, and what is not? Also, what features do all spatial metaphors seem to share? For spatial metaphors that have motion in the source domain, for instance, TIME IS MOTION, is there mental simulation of motion? And last, when does space serve as the source domain in spatial reasoning, for instance, in reasoning about complex spatial layouts?

To get to a better understanding of how spatial metaphors work, we need a better handle on what spatial metaphors are and how they are actually used. We also need to investigate when and how metaphors are learned, how they naturally arise, and how they can be applied to help with real world problems, including environmental issues and political negotiations. This will require going beyond the study of metaphor comprehension in simple lab experiments. It will necessitate looking closely at how metaphors are used in natural discourse “in the wild”, across different contexts, across different slices of time, and across different cultures. It will also require looking at how linguistic information or interacts with or affects metaphor use, for instance, looking at how tense and aspectual information (e.g., “was “VERB+ed” versus “VERB+ed”) interacts with metaphor. And it will require carefully studying how and when metaphorical language is used in learning and discussing abstract material.