

Learning Objectives

The goals of Chapter 9 are to help readers do the following:

1. Understand the principles of cognitive metaphor theory.
2. Learn qualitative techniques for analyzing metaphorical language.
3. Learn about partially and fully automated methods for identifying and analyzing metaphors in large text collections.

In this chapter, we review text analysis techniques that focus on metaphor. Much like narrative analysis, metaphor analysis techniques are used to gain insights into the divergent ways individuals and social groups come to interpret the social world. Whether taking the form of metaphor, analogy, simile, or synecdoche, metaphorical language involves figures of speech that make implicit comparisons in which a word or phrase ordinarily used in one domain is applied in another. While metaphor has long been a topic of literary scholarship, it was only in 1980 with the publication of George Lakoff and Mark Johnson's *Metaphors We Live By* that metaphor came to be an object of social science research. Lakoff and Johnson's (1980) approach to metaphor has come to be known as cognitive metaphor theory and has provided the conceptual foundation for the field of cognitive linguistics (Gibbs, 1994; Kovecses, 2002; Lakoff & Johnson, 1999; Sweetser, 1990).

We begin this chapter with a brief overview of cognitive metaphor theory, an approach to metaphor analysis developed by Lakoff, Johnson, and many of their fellow cognitive linguists that is based on the idea that language is structured by metaphor at a neural level and that metaphors used in natural language reveal cognitive schemas and associated patterns of neural connections shared by members of social groups. We review exemplary social science studies that use qualitative and mixed methods of metaphor analysis, focusing of course on these studies' research designs and methodologies. We also review promising recent efforts to automate the identification of metaphorical language in large text corpora. The chapter ends with a survey of software that has proven useful for metaphor analysis in social research.

Theoretical Foundations

The basic claim of cognitive metaphor theory is that metaphor is a central and indispensable structure of thought and language. All natural language is characterized by the presence of conventional metaphorical expressions organized around prototypical metaphors, which Lakoff and Johnson (1980) refer to as *conceptual metaphors*. These are linguistic expressions of the conventional pattern of thought of a group or society (Kovecses, 2002). For instance, Lakoff and Johnson argue that in many cultures people conceptualize *argument* in terms of a *battle*. This prototypical conceptual metaphor influences the way people talk about the act of arguing—for instance, when they use phrases such as “attack a position,” “indefensible,” “strategy,” “new line of attack,” “win,” and “gain ground” (Lakoff & Johnson, 1980, p. 7).

According to cognitive metaphor theory, metaphors originate in a process of “phenomenological embodiment” (Lakoff & Johnson, 1999, p. 46). They are formed when perceptual and sensory experiences from an embodied *source domain*, such as pushing, pulling, supporting, balance, straight–curved, near–far, front–back, and high–low, are used to represent abstract entities in a *target domain* (Boroditsky, 2000; Lakoff, 1987; Richardson, Spivey, Barsalou, & McRae, 2003).

Cognitive metaphor theory is capable of explaining universal aspects of language and culture as well as cultural variation (Kovecses, 2002). While languages’ phenomenological foundations are universal, societies and social groups differ in terms of the associations they make between conceptual metaphors and abstract target domains. In other words, different societies and groups use different sets of metaphors to construct and interpret social reality in different ways. An implication of cognitive metaphor theory for social research is that studying the distribution of metaphor in natural language can reveal how common sense is constructed and negotiated within groups.

Cognitive linguists themselves have studied metaphors used in natural language. For instance, both Lakoff (1996) and Chilton (1996) studied metaphors related to security used in political discourse. Charteris-Black (2009, 2012, 2013) has developed a rhetorically based approach to metaphor known as critical metaphor analysis that draws on methodologies and perspectives developed in cognitive linguistics, corpus linguistics, and critical linguistics. He has used the approach to examine metaphors from the domains of political rhetoric, press reporting, religion, and the communications of a wide range of political leaders. He has also worked jointly with sociologists on the relationship between gender, language, and illness narratives. And Goatly (2007) investigated how conceptual metaphor shapes thought and behavior in fields including architecture, engineering, education, genetics, ecology, economics, politics, industrial time-management, medicine, immigration, race, and sex. He argues that the ideologies of early capitalism used metaphor themes historically traceable through Hobbes, Hume, Smith, Malthus, and Darwin and that these metaphorical concepts support neo-Darwinian and neoconservative ideologies up to the present

day. Hart (2010) has advocated for a cognitive linguistic approach to critical discourse analysis (see Chapter 2). Hart's approach involves a semantic analysis of particular lexical, grammatical, and pragmatic features found in political and media discourse. More narrowly, it investigates the conceptual structures that are associated with different language usages and the ideological functions that such structures may serve. He has applied this framework primarily in the context of anti-immigration discourse (Hart, 2010).

While the critical natural language studies of metaphor by Chilton, Charteris-Black, Goatly, Hart, and Lakoff are innovative and important contributions, their impact has been mainly felt in linguistics rather than in the social sciences. But social researchers working in the fields of anthropology, education, management, political science, psychology, sociology, and other fields have used cognitive metaphor theory in text mining and analysis projects of their own. We review some of this work in the next sections, starting with qualitative studies and then covering mixed methods research.

Qualitative Metaphor Analysis

In the social sciences, metaphor analysis is a semantic text analysis technique concerned with latent meaning rather than a thematic technique concerned with the manifest meaning of text (Roberts, 1997). Influenced by cognitive metaphor theory, researchers from anthropology, education, management, psychology, and sociology have developed a number of methods of qualitative metaphor analysis.

Anthropology

There is much anthropological literature on metaphor, although most anthropological studies use ethnographic rather than text mining or text analysis methods. James Fernandez's 1991 edited collection *Beyond Metaphor* provides a good overview of early ethnographic work in this area, and cognitive anthropologists Dorothy Holland and Naomi Quinn's 1987 classic *Cultural Models in Language and Thought* was a breakthrough in terms of connecting anthropology to cognitive linguistics and cognitive metaphor theory (see also Strauss & Quinn, 1997). Some of the work on metaphor done by anthropologists does employ text analysis techniques, such as Strauss's (1997) study of what industrial workers and their neighbors think about the free enterprise system, Quinn's (1996) studies of metaphors used by Americans in talking about their marriages, and Kempton's (1987) study of Americans' lay theories of home heat control.

Educational Research

Cameron (2003) and other educational researchers have used cognitive metaphor theory to analyze figurative language used by students and teachers in classroom

settings. More recently Rees, Knight, and Wilkinson (2007) analyzed metaphors in strategically collected transcripts of patients', medical students', and doctors' discussions of doctor-patient interactions. The data for their qualitative and inductive study were from multiple document collections, including focus group discussions with patients, medical students and medical educators. Their analysis revealed six prototypical metaphors associated with the target domain of student and doctor-patient relationships: the relationship as war, hierarchy, doctor-centeredness, market, machine, and theater. All of the metaphors except the theater metaphor emphasized the oppositional quality of student and doctor-patient relationships.

Political Science

As part of the rhetorical turn in political science (see Beer & Hariman, 1996), researchers have turned to metaphorical language in policy documents, speeches, and other political texts to explore the ways metaphors mediate relations between countries and other political actors. For example, the edited collection *Metaphorical World Politics* (Beer & De Landtsheer, 2004) includes chapters on the metaphors that have guided and shaped American foreign policy in the public arena since the start of the Cold War. The studies in this collection cover metaphors for democracy, war and peace, and globalization. The chapters' authors analyze sports metaphors in Desert Storm discourse, disease metaphors used during the Cold War for the threat of communism, and path metaphors used in deliberations over U.S. foreign policy toward Cambodia, among other conceptual metaphors (see also Carver & Pikalo, 2008). Methodologically, most political science studies of metaphor are basically qualitative, although there have been some mixed methods studies as well (e.g., De Landtsheer & De Vrij, 2004).

Psychology

Clinical psychologists have analyzed metaphors used by subjects in psychoanalytic therapy (Buchholz & von Kleist, 1995; Roderburg, 1998), and cognitive and experimental psychologists have studied metaphors as examples of mental models (Johnson-Laird, 1983, 1989). But within psychology, only Schmitt (2000, 2005) has developed a qualitative method of text analysis centered on metaphor. Schmitt's (2000) "rule-based and step-by-step approach" (p. 2) is idiographic and qualitative and is based on inductive inferential logic. It operates at a sociological level of analysis that involves making inferences about the community that generates the text being analyzed and involves a multiple-document-collection data selection strategy. The goal of Schmitt's (2000) method of systematic metaphor analysis is to "discover sub-cultural thinking patterns" (p. 365), and his method accomplishes this in several steps. The first step is for the researcher to choose a topic of analysis. Schmitt (2000) gave the example of abstinence from his own empirical work on metaphors for abstinence and alcoholism. The next step is to assemble a "broad-based collection of background metaphors" (Schmitt, 2005, p. 370) for the topic. These metaphors

can be collected from sources such as encyclopedias, journals, and specialist and generalist books. In Schmitt's own work, background metaphors include metaphors for the effects of drinking alcohol such as being more "open" versus "fencing off" from others. The third step is to analyze the metaphors used in the natural language of the subgroup. This involves creating the second document collection, identifying metaphors in that collection, and then reconstructing metaphorical concepts from those metaphors. The fourth and final step is to compare the metaphorical concepts from the two document collections in order to learn about the culture and psychology of the subgroup in comparison to the culture and psychology of the general population.

Sociology

Similar to the work of the linguist Christopher Hart, in *Brown Tide Rising* (2002) the sociologist Otto Santa Ana (2002) combined critical discourse analysis (Chapter 2) and metaphor analysis. Santa Ana's data are newspapers that he used to study mass media representations of Latinos in the United States.

More recently, the sociologists Schuster, Beune, and Stronks (2011) have studied metaphorical constructions of hypertension among ethnic groups in the Netherlands. Rather than using secondary data, as is the case for most of the studies reviewed previously, Schuster and colleagues (2011) collected their own data by transcribing interviews they performed with members of three ethnic groups in the Netherlands. Their approach is basically inductive and involves constructing multiple corpora translated from different languages.

Mixed Methods of Metaphor Analysis

Social researchers have developed a number of mixed methods strategies for metaphor analysis. Generally, these involve human coding of metaphors in combination with statistical tests for both interrater reliability and differences in rates of metaphor use across multiple document collections. The document collections are typically produced by social groups with different social or cultural backgrounds. Where qualitative metaphor analysis (e.g., Santa Ana, 2002; Schmitt, 2005) is mostly inductive, mixed methods research is mostly deductive, although it often involves abductive inference as well (see Chapter 2).

Management Research

Management researchers Gibson and Zellmer-Bruhn (2001) used a mixed method of metaphor analysis to study concepts of teamwork across national organizational cultures. Their theory-driven project used a deductive inferential logic, featured a research design with multiple corpora, and operated at a sociological level of analysis in that the researchers analyzed texts for the purpose of learning about the organizations and societies that produced them. This study's goal was to test a well-known

theory of the influence of national culture on employees' attitudes (Hofstede, 1980). Gibson and Zellmer-Bruhn (2001) tested this theory with a research design that included strategic selection first of four nations (France, the Philippines, Puerto Rico, and the United States) and then of four organizations based on Hofstede's theory (p. 281). The researchers conducted interviews that they transcribed to form their corpora, which they analyzed using QSR NUD*IST (Qualitative Solutions and Research, 1997) and TACT (Bradley, 1989; Popping, 1997). These software packages were used to organize the qualitative coding of five frequently used teamwork metaphors, which were then used to create dependent variables for hypothesis testing using multinomial logit and logistic regression.

Psychology

The social psychologist Karin Moser (2000) has developed a metaphor-based method of text analysis that she has applied in her research on the psychology of work and organizations. Moser's mixed methods approach involves categorizing metaphors for the self during transitions from school to work. The self-concept is highly complex and abstract and is thus often represented with metaphors. The subjects Moser studied were Swiss German students who participated in a questionnaire study about their anticipated transition from university to work. A subsample of 12 students was included in the study and interviewed about their experiences with success and relationship quality and their expectations and wishes for the future. The transcribed interviews were analyzed thematically and for self-metaphors and other aspects of the students' self-concepts. Her quantitative analysis of this data revealed statistically significant relationships between themes and metaphors and between metaphors and self-concepts. There was a general preference for scientific and technological metaphors, followed by container, path, visual, balance, war, and economic metaphors. Metaphor use is also significantly influenced by social variables such as the general orientation toward the future; the field of study; and, to a smaller extent, gender.

Sociology

The sociologist Ignatow has developed mixed methods of metaphor analysis in studies of high-tech jargon (2003), transcripts of shipyard workers' meetings (2004), and discussions by members of online self-help groups (2009). His mixed method approach is nomothetic and based on deductive inference, operates at a sociological level of analysis, and involves both strategic selection of and statistical sampling from multiple document collections (with the exception of the 2004 study). He uses metaphor analysis in combination with other text analysis methods such as narrative analysis (2004; see Chapter 8) and semantic network analysis (2009) to test theories related to culture and to the work of the sociologist Pierre Bourdieu. Software used includes TextAnalyst and the statistical packages Stata and SPSS.

Automated Metaphor Identification Methods

Both qualitative and mixed methods metaphor research are ultimately reliant on human interpretation and coding of metaphors in texts. Such coding is subject to coder fatigue, coder bias, and problems of coder interrater reliability. It is also time-intensive, and the time required for training and coding has thus far limited researchers' ability to scale up metaphor analysis for use with big data. But today, the situation is changing rapidly, as several research teams in computer science and related fields are developing computer-assisted methods for automatically detecting metaphors in texts.

Early attempts by Fass (1991) and more recent work by Mason (2004) relied on predefined semantic and domain knowledge to attempt to identify metaphor in texts. Birke and Sarkar (2007) approached the problem by considering literal and nonliteral usages to be different senses of a single word. Hardie, Koller, Rayson, and Semino (2007) repurposed semantic annotation tools in order to extract possibly metaphoric phrases from texts. Turney, Neuman, Assaf, and Cohen (2011) identified metaphorical phrases by assuming that these phrases consist of both a more concrete and a more abstract term. They derived an algorithm to define the abstractness of a term and then used this algorithm to contrast the abstractness of adjective–noun phrases. Phrases were labeled as metaphorical when the difference between the abstractness of the noun and the abstractness of the adjective passed a predetermined threshold.

Recently, Gandy, Neuman, and their colleagues (Gandy et al., 2013; Neuman et al. 2013) have developed a number of interrelated algorithms that have been able to identify metaphorical language in texts with a high level of accuracy. Their work is based on Turney and colleagues' (2011) key insight that a metaphor usually involves a mapping from a concrete domain to a more abstract domain. The algorithms are thus based on a target noun's abstractness and its accompanying adjective's number of dictionary definitions (if there is only one, the adjective cannot be part of a metaphor). If none of the most common concrete nouns that are commonly associated with the adjective are present, the target noun is coded as metaphorical.

The results so far of these efforts by computational linguists to automate metaphor extraction suggest to us that there is great potential for automated methods of metaphor analysis to be used in social science text mining and analysis applications in the near future.

Software for Metaphor Analysis

Many of the software tools and packages reviewed in Part II can be used for metaphor analysis as well as for narrative analysis, including QDAS (qualitative data analysis software) packages such as ATLAS.ti (<http://atlasti.com>; see Kalo & Racz, 2014), MAXQDA (<http://www.maxqda.com>), and NVivo (<http://www.qsrinternational.com/product>).

Do not copy, post, or distribute