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The role of metaphor in communication and thought

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Abstract

Metaphor is pervasive in everyday communication. It is known to help people understand complex topics, communicate efficiently, and influence others. In this paper, we provide a review of the literature on the utility of metaphor, describing key findings and controversies while underscoring recent experimental and theoretical advances. We begin with a brief introduction to metaphor and offer a critical assessment of the claim that conventional metaphors in language *reflect* underlying conceptual representations and processing, a view associated with Lakoff and Johnson's groundbreaking conceptual metaphor theory (CMT). We then discuss recent research that examines whether and how metaphor shapes attitudes and reasoning, outlining some of the cognitive, affective, and social forces that moderate the efficacy of metaphors on decision making. Throughout the paper, we highlight theoretical implications of the research and identify challenges that warrant further investigation in the study of metaphor. In the end, this work paints a complex and dynamic view of metaphor in communication and cognition.

1 | INTRODUCTION

Before the 2016 U.S. Presidential Election, Donald Trump announced, "It is time to drain the swamp in Washington, D.C." (Fox News, October 21, 2016). This swamp metaphor saw frequent

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Authors contributed equally to this study.

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use in the following months.[1] *The Nation* referred to Paul Ryan and other House Republicans as "swamp creatures" who "dive into the swamp" (January 3, 2017), and *Vanity Fair* used Trump's own rhetoric against him, reporting that he had "quickly turned downtown D.C. into an amphibian paradise" by filling his administration with billionaires (January 5, 2017). The metaphor persisted in Trump's statements over a year later, including "Sometimes it may not look like it, but believe me, we are draining the swamp" (CNN, April 18, 2018).

The swamp metaphor uses a particular type of physical location to ground our understanding of political excess, stagnation, and corruption. A real swamp is a hot, wet, murky place that houses mosquitoes, snakes, alligators, and other harmful creatures that have been around for hundreds of millions of years. So too in congress, figuratively speaking. Using a swamp to frame how politics does or does not work on Capitol Hill is just one way metaphor is deployed for rhetorical purposes even though a large body of research suggests that metaphors play a much broader role in our cognitive ecology. In this paper, we review this literature, tracing the history of research and debates on metaphor while underscoring recent experimental and theoretical advances. In the end, our work paints a complex and dynamic view of metaphor in communication and cognition.

We begin with a brief introduction to metaphor, including claims about the role of cognition in metaphor use and understanding. We then discuss new research on the persuasive power of metaphor and go on to outline some of the cognitive, affective, and social forces that moderate the influence of metaphor on decision making. Along the way, we identify challenges that warrant further investigation in the ongoing study of metaphor.

1.1 | What is metaphor?

Metaphor pervades speech, text, and signed language (Gibbs, 1994; Lakoff & Johnson, 1980). It also appears in music, dance, architecture, and visual media, such as comics (Forceville, 2008). In Figure 1, a picture of a swamp metaphorically depicts the U.S. government, with President Donald Trump looming large and holding a plug in his hand. The plug has resulted in a state change; people are being sucked into a downward spiral. Metaphors, like this one, have a *source* domain and a *target* domain. They also have a *mapping*, whereby information from the source domain is linked to information in the target domain.[2] The source domain of Trump's "drain the swamp" metaphor, verbal or pictorial, is "the swamp" and the target domain, the political establishment. The "mapping" links the swamp and government. For example, "swamp" in the source domain maps onto "U.S. government" in the target domain; "swamp water" maps onto "people and structures in government"; and "drain" maps onto "remove."

Metaphorical mappings are partial. Sometimes it is the more basic perceptual features of the source domain that map onto the target domain ("the sun is an orange"). Other times it is the more complicated structural relations in the source domain that map onto the target domain. Trump's swamp metaphor draws on some of the more complex structural information of the source domain. Swamps serve important ecological functions (e.g., purifying surface water) and are home to life forms that humans value, such as lush green trees, bald eagles, and tadpoles. But these more positive elements are not systematically mapped onto the U.S. government (see Grunwald, 2006, for discussion of the virtues of swamps). The partial nature of mapping enables metaphors to highlight some features of a target domain (e.g., political corruption) and background or downplay others (e.g., treaties and trade).

FIGURE 1 Visual depiction of Trump's swamp metaphor

Metaphorical language and images often occur in systems (or families) of *conventionalized* metaphors (Gibbs, 1994; Kövecses, 1986; Lakoff & Johnson, 1980; Yu, 2008). For instance, time, love, change, and many other phenomena metaphorically refer to physical motion in space in some way (e.g., "We're *approaching* Labor Day," "*Where* is this relationship *going*?," and "The U.S. is *inching toward* sanctions with Iran"). But sometimes metaphors are generated without an obvious connection to existing systems of metaphors. When Trump first mentioned the swamp metaphor, it is likely that many Americans did not associate it with other, more conventionalized political metaphors. Over time, though, this metaphor has become more systematic and conventional, evidenced by novel extensions of the metaphor (e.g., Washington DC is an "amphibian paradise"; House Republicans are "swamp creatures").

1.2 | Why metaphor?

Metaphor can make communication more economical and efficient (Ortony, 1975; Richards, 1936), and it can fill lexical gaps and motivate semantic change (Billow, 1977; Gibbs & Colston, 2012; Sweetser, 1991). This is seen in how people talked about the Web when it evolved in the 1990s. People needed a way to describe their experiences with this highly abstract domain, and active spatial metaphors were helpful, as in "navigating" the Web and "going" or "coming" to websites (see Matlock, Castro, Fleming, Gann, & Maglio, 2014). Metaphor is also a tool for explanation and persuasion (Duit, 1991; Lakoff, 2009; McCormac, 1985; Thibodeau, Crow, & Flusberg, 2017). And the ability to generate and think with metaphors has been associated with everything

from creativity (Cacciari, Levorato, & Cicogna, 1997) to scientific innovation (Dunbar & Klahr, 2012; Kuhn, 1993). At the heart of these claims is the idea that metaphors both *reflect* underlying conceptual structures and processes and *shape* how people think. Studying metaphor can therefore lead to a better understanding of the relationship between language and thought (Gibbs, 1994; Lakoff & Johnson, 1980, 1999).

In groundbreaking work, Lakoff and Johnson (1980) proposed conceptual metaphor theory (CMT). Earlier proposals or approaches tended to treat metaphor as an ornamental feature or secondary part of language (e.g., Searle, 1993), and CMT helped to shift this view. Speakers of all languages and across all cultures use metaphor (Kövecses, 2010; Winter & Matlock, 2017; Yu, 2008). Figurative language is estimated to comprise about 10% to 20% of natural discourse (Geary, 2011; Steen et al., 2010). Psychological studies indicate that metaphorical language is typically no more difficult to process than literal language (see Gibbs & Colston, 2012, for review) even though novel metaphors may require additional processing (Bowdle & Gentner, 2005). In early work on CMT, Lakoff and Johnson (1980) stressed that the frequent, consistent patterns of metaphor in natural language show how it plays an important role in the human conceptual system. In their view, people use familiar conceptual domains (e.g., space, war, and motion) to organize how they reason about relatively unfamiliar, abstract, or complex concepts (e.g., time, arguments, and life itself). Our understanding of time, for example, draws on what we know about space and motion, as reflected in statements such as "My birthday is *coming* soon" and "Summer vacation is *around the corner*." Our understanding of arguments is shaped by our knowledge of war, evident in statements like "His claims are *indefensible*" and "She *threw a grenade into* the discussion" (see also Gibbs, 2011; Lakoff, 1993).

According to CMT, meaning is grounded in embodied experience (Lakoff & Johnson, 1999). The idea is that our mundane physical experiences, such as lying down, standing up, walking, and exhaling and inhaling, give rise a system of *image-schemas*––tacit assumptions about position and orientation, motion, containment, balance, and more (see also Johnson, 1987). These quasi-primitive sensorimotor representations are thought to provide a foundation for abstract thinking via metaphorical mapping. For example, we are able to think about how time passes via our implicit understanding of how we and other objects move through space, giving rise to the conceptual metaphor TIME IS SPACE (Boroditsky, 2000; Clark, 1973; Radden, 1997). And we are able to think about degree of familiarity and intimacy in relationships in terms of physical proximity, giving rise to the conceptual metaphor SOCIAL DISTANCE IS SPATIAL DISTANCE (Matthews & Matlock, 2011; Winter & Matlock, 2013).

These ideas—that metaphors reflect and shape cognitive processing and that metaphorical meaning is grounded in embodied experience—have been examined using linguistic methods like critical discourse analysis (Charteris-Black, 2011; Fairclough, 2013; Musolff, 2016) and psychological methods like observational and experimental studies (Boroditsky, 2000; Flusberg, Matlock, & Thibodeau, 2017; Gibbs, 2013; Thibodeau, Hendricks, & Boroditsky, 2017). We discuss evidence for and critiques of this view below.

2 | DO METAPHORS REFLECT CONCEPTUAL REPRESENTATIONS?

The central claim of CMT is that metaphor is a psychological phenomenon, and that people use it to think and reason about abstract ideas and complex issues even though they may not be aware of this fact (Lakoff & Johnson, 1980, 1999). On this view, talking about your birthday

"coming soon" is more than just a colorful way of describing a future event. People who talk about future events figuratively moving toward them in space are thought to be drawing on a particular spatial image schema to conceptualize the passage of time. In this way, CMT challenges the view that metaphor (and language in general) is merely a tool for *expressing* (literal) thought (e.g., Pinker, 2007). According to CMT, we can gain insight into underlying conceptual representations by observing how people use metaphors in normal communication.

2.1 | Critiques of CMT

Some researchers have challenged the idea that conventional metaphors reflect underlying conceptual representations and processes in a meaningful way (e.g., Keysar & Bly, 1995; McGlone, 2007, 2011; Murphy, 1996, 1997; Pinker, 2007; Ritchie, 2003). For example, Murphy (1996, 1997) noted that CMT fails to account for why metaphoric mappings are only partial. Washington DC is only a metaphorical swamp where people get figuratively stuck and muddy, not a literal swamp. If people were really representing the target domain of U.S. politics as a swamp, what would keep them from making more false or incomplete inferences? For example, if Trump truly managed to "drain the swamp," why do not people assume there would be fewer mosquitos in DC next summer? And if U.S. politics is conceptualized as a boggy marshland, then how could people possibly think about it in terms of other metaphorical source domains like *war* or *theater* in other contexts?

Murphy also argued that the original line of reasoning for CMT was overly reliant on patterns of language use in making claims about mental representation. Consider the statement, "Let's push the long meeting back." To understand this temporal sentence do you need to actively recruit your knowledge of space? This is difficult to answer with linguistic evidence alone. People may be thinking about TIME as SPACE when talking about pushing long meetings back. But another possibility is that these conventional metaphors have become *idiomatic*—that speakers have memorized their meanings without having to activate knowledge about the source domain at all (cf. Pinker, 2007; see also Casasanto, 2009).

Another criticism of CMT concerns its reliance on researchers' intuitions. Keysar and Bly (1995) questioned the validity Lakoff and Johnson's taxonomy of conceptual metaphors. They argue that people can have faulty intuitions about the original meaning of highly conventionalized metaphors, such as idioms. Are phrases like "His claims are *indefensible*," "She *attacked* every *weakness* in his argument," and "Her criticisms were *right on target*," linguistic instantiations of an ARGUMENT IS WAR conceptual metaphor? Or, are they instances of ARGUMENT IS A GAME, or some other metaphor (Ritchie, 2003)?

This points to a related concern about CMT's emphasis on embodied experience. Most people have had the experience of engaging in arguments or playing games, but few have experienced war firsthand. The prevalence and utility of *war* as a metaphorical source domain would therefore seem to rest on factors above and beyond the more physical aspects of embodied experience (Flusberg, Matlock, & Thibodeau, 2018; see also Casasanto & Gijssels, 2015). More generally, the initial formulation of CMT provides few details about the cognitive processes involved in metaphorical mapping (e.g., Holyoak & Stamenković, 2018; Lakens, 2014; McGlone, 2011; Murphy, 1996). There are, however, several process models of analogy, categorization, and metaphor comprehension that are compatible with the basic ideas of CMT without committing to the stronger claims about embodiment and active conceptual mappings (e.g., Falkenhainer, Forbus, & Gentner, 1989; Kintsch, 2000).

2.2 | Some evidence for metaphoric representation

In the early 21st century, researchers developed new experimental methods to address these and other concerns about CMT. Much literature now supports the view that metaphors really do reflect underlying conceptual representations, though perhaps not always. Two popular approaches involve showing that (a) processing a conventional metaphor selectively activates relevant source domain knowledge and (b) activating source domain knowledge affects how people reason about the associated target domain.

2.2.1 | Metaphor processing findings

Response time studies have suggested that processing conventional metaphors activates conceptual mappings to the metaphorical source domain (Allbritton, McKoon, & Gerrig, 1995; Gentner, Imai, & Boroditsky, 2002; McGlone & Harding, 1998; Nayak & Gibbs, 1990). For example, reading a conventional metaphor like "Crime has become an *epidemic* that can't be *cured*" facilitates the processing of a source-domain-related novel metaphor like "No *treatment* is strong enough to stop it" but not a meaning-matched, source-domain-unrelated novel metaphor like "No *cage* is strong enough to contain it" (Thibodeau & Durgin, 2008; see also Gentner et al., 2002). In addition, neuroimaging studies have shown that specific sensorimotor regions of the brain (e.g., the hand motor area) are activated when people process metaphors related to perception and action (e.g., "She *grasped* the idea"; Boulenger, Shtyrov, & Pulvermüller, 2012; see also Citron & Goldberg, 2014; Lai & Curran, 2013).

Taken together, these findings support the view that people automatically activate source domain representations as they are processing conventional metaphors. As this work focuses on language processing, though, it is fails to provide compelling evidence for the stronger claim that people *think* metaphorically, even in non-linguistic task settings.

2.2.2 | Source domain activation findings

Priming studies show that manipulating how people are currently thinking about a source domain (e.g., space) can affect how they reason about a target domain (e.g., time) in a metaphor-congruent fashion (Casasanto, Fotakopoulou, & Boroditsky, 2010; Ebersole et al., 2016). For example, Boroditsky (2000) found that spatial primes (i.e., visual depictions of spatial relations) reliably influenced how people responded to an ambiguous temporal question ("Next Wednesday's meeting has been moved forward two days. Which day is the meeting now that it's been moved?"). Priming people to imagine themselves moving toward target objects in space induced an *ego-moving* representation of time (meeting moved to Friday); priming people to imagine themselves as static in space with target objects coming toward them induced a *time-moving* metaphor (meeting moved to Monday).

Some of the most striking results have emerged in studies that use an "embodied" priming technique. Such work involves priming a particular sensorimotor experience as participants make a judgment or decision in a metaphorically linked domain[3] (for recent reviews and discussion, see Lakens, 2014; Lee & Schwarz, 2014; Meier, Schnall, Schwarz, & Bargh, 2012). This research has shown (a) that holding a warm (versus cold) cup leads people to view others in a more positive light (i.e., more "warmly"; Williams & Bargh, 2008); (b) that smelling a fishy odor leads people to be more suspicious (Lee & Schwarz, 2012); (c) that holding a

heavy (versus light) clipboard leads people to judge things as more important (i.e., they have more "weight"; Jostmann, Lakens, & Schubert, 2009; see also Ackerman, Nocera, & Bargh, 2010); (d) that physically leaning to the right makes people more politically conservative (i.e., more "right-leaning"; Oppenheimer & Trail, 2010); and (e) that sitting in a hard (versus soft) chair makes people take a "harder" line in hypothetical negotiations (Ackerman et al., 2010). These findings suggest that embodied conceptual metaphors guide everyday thought and action (Landau, Meier, & Keefer, 2010).

However, embodied priming research has been met with skepticism by researchers concerned with (a) common methodological practices, which have contributed to the so-called "replication crisis" in psychology, and (b) the theoretical value of embodiment claims in metaphor research (Casasanto & Gijssels, 2015; Lakens, 2014; see our discussion in Section 2.1). Some methodological concerns include an overreliance on small sample sizes with low statistical power, researcher "degrees of freedom" in analytic approaches (i.e., the tendency to prune data and run many statistical tests until a "significant" result is obtained; see Simmons, Nelson, & Simonsohn, 2011), and low rates of replicability (Lakens, 2014). For example, while several researchers have reproduced the basic "weight as embodied importance" findings described above (e.g., Maglio & Trope, 2012), many have failed to replicate the original experiment by Jostmann, Lakens, & Schubert (e.g., Ebersole et al., 2016; see also http://psychfiledrawer.org, a website that catalogs replication attempts and documents three failures to replicate this study). Scholars interested in advancing research on embodied priming are therefore encouraged to adopt methodological reforms promoted by supporters of the recent open science movement (Finkel, Eastwick, & Reis, 2015; Munafò et al., 2017; Shrout & Rodgers, 2018).

A slightly different method for investigating the psychological reality of metaphoric representation involves simultaneously presenting participants with information in both source and target domains in the same task. If participants show a *response-compatibility* effect—that is, if source domain information modulates target domain reasoning in a metaphor-congruent manner—this would support the idea people automatically recruit source domain representations to reason about the target domain. In one study, participants completed a series of trials where they observed a horizontal line expanding outwards on the screen (Casasanto & Boroditsky, 2008). At the end of each trial, they had to indicate either the spatial extent of the line or the amount of time it was growing on the screen. The results revealed that the spatial length of the line systematically biased estimates of trial duration (longer line = longer time estimate), supporting the idea that people rely on spatial representations to think about time. Comparable results have obtained for other conventional spatial metaphors, including GOOD IS UP/BAD IS DOWN (as in, "She's *flying high* while I'm *down* in the dumps"; see Casasanto & Dijkstra, 2010; Flusberg, Shapiro, Collister, & Thibodeau, 2016; Meier & Robinson, 2004). These studies are especially revealing as most rely on non-linguistic tasks, thus, avoiding the critique that metaphoric representations may only play a role in the course of language processing itself.

Studies in this vein have also revealed that conventional metaphors do not always reflect underlying cognitive processes. For example, Casasanto (2008) examined whether people rely on spatial representations to organize the concept of *similarity,* especially that we often use SIMILARITY IS CLOSENESS IN SPACE metaphors (as in, "those shades of blue are pretty *close* to one another, but the politicians' views couldn't be *farther apart*"). Participants viewed pairs of words, faces, or objects on the screen and judged how similar they were. Spatial distance between the stimuli was systematically varied. The results revealed that when participants made *abstract* similarity judgments (e.g., how similar in *meaning* are two abstract

words?), stimuli that appeared closer to one another in space were rated as more similar, supporting the metaphoric representation view. However, when participants made a more *concrete* similarity judgment (e.g., how similar in *appearance* are two faces?), stimuli that appeared closer to one another were actually rated as *less* similar (see also Boot & Pecher, 2010; Winter & Matlock, 2013).

These findings offer an important constraint on theories like CMT, which cannot predict these divergent patterns of behavior based on linguistic analyses alone. This suggests that linguistic metaphors must be subjected to careful experimentation to determine whether (and when, and how) they reflect underlying conceptual mappings. One opportunity for future research in this vein is to develop more precise theoretical accounts of the *partial* nature of metaphoric mappings (Murphy, 1996, 1997). That is, theories of metaphoric representation should be able to specify and explain why only certain aspects of the source domain (e.g., swamps) are mapped onto the target domain (e.g., DC politics). This would help researchers assess the degree to which people are really *thinking* metaphorically.

3 | DO METAPHORS SHAPE DECISION MAKING?

The claim that metaphors *reflect* underlying conceptual representations is the idea that metaphors in natural language *mirror* how people think. A related, but distinct, claim is that the metaphors we encounter actually *shape* how we reason about the world, a possibility George Lakoff has written about in his popular work on the language of politics (Lakoff, 2004, 2009). This is more of a process-oriented view of metaphor that explores how people *use* metaphors to learn about novel concepts, make decisions about complicated issues, and influence others (Thibodeau, Hendricks, & Boroditsky, 2017).

Consider spatiotemporal metaphors. As noted, English speakers frequently use space to talk about time, including the passage of time. They do this by leveraging one of two mappings: an *ego-moving* perspective, whereby people "move" forward through time ("We're heading toward the weekend"), or a *time-moving* perspective, whereby people remain still as time approaches and passes by them ("The weekend is approaching"; Clark, 1973). Both these two mappings are known to exist in Mandarin Chinese, but Mandarin has a higher frequency of *time-moving* metaphors (Ahrens & Huang, 2000; Alverson, 1994; Dong, 2004). It makes sense, then, Mandarin speakers are more likely to spontaneously use *time-moving* metaphors in laboratory tasks than English speakers, who default to *ego-moving* metaphors, while Mandarin-English bilinguals tend to use the two metaphors somewhat evenly (Lai & Boroditsky, 2013; see also Boroditsky, Fuhrman, & McCormick, 2011). Thus, prevalent spatial metaphors not only reflect the way speakers of that language think about time, they also shape how they think about it. People naturally talk and think using patterns of metaphor that are common in their own language, and when learning languages, they adjust by using new metaphors in those languages (Kövecses, 1986, 2010; Winter & Matlock, 2017).

In addition to cross-linguistic research on metaphor, research on *metaphor framing* is becoming more popular. In metaphor framing studies, participants are typically presented with a brief description of a target issue like crime, immigration, or depression infused with one of a few possible metaphorical (and sometimes non-metaphorical) frames, and then asked to make a decision or judgment in the target domain. Researchers examine whether they respond in a way that is consistent with the metaphorical frame (see Table 1 for examples of recent studies and Winter & Matlock, 2015, for discussion). In one study, by

TABLE 1 Results from a sample of recent metaphor framing experiments

Target domain	Source domain(s)	Outcome	Reference
Cancer	Enemy vs. neutral	*Enemy* reduces intention to limit behaviors that increase likelihood of cancer	Hauser and Schwarz (2015)
Flu	Neutral (virus) vs. Metaphorical (as a beast, riot, army or weed)	Metaphorical frames increased intentions to get vaccinated	Scherer et al. (2015)
Crime	Beast vs. Virus	*Virus* increases support for social reform; *beast* for enforcement	Christmann and Göhring (2016); Thibodeau and Boroditsky (2011, 2013)
Police	Guardian vs. Warriors	*Guardian* led to more positive attitude of police	Thibodeau, Crow, and Flusberg (2017)
Climate change	War vs. Race	*War* associated with greater perceptions of urgency, risk, and willingness to change behavior	Flusberg et al. (2017)
Ideas	Light bulbs vs. Seeds	*Light bulb* ideas are more exceptional	Elmore and Luna-Lucero (2017)
Loving relationship	Journey vs. Perfect Union	Conflict hurts more on *perfect union*	Robins and Mayer (2000)

Thibodeau and Boroditsky (2011), participants first read a description of crime that was framed as either a "beast" or "virus" ravaging a city, and then indicated how the city should deal with the issue. Across a series of experiments, participants exposed to the "beast" frame were more likely to recommend a solution to the problem that was more enforcement oriented (e.g., hiring more police officers and caging more criminals), consistent with how a literal problem with a beast would be handled (also see work by Thibodeau & Boroditsky, 2013, and Christmann & Göhring, 2016; for a critique of these studies, see Steen, Reijnierse, & Burgers, 2014).

As Table 1 shows, recent studies reveal that metaphors can influence how people think about a wide range of sociopolitical issues (e.g., crime, law enforcement, and climate change), health challenges (e.g., cancer and the flu), abstract concepts (e.g., ideas), and emotional experiences (e.g., loving relationships). One meta-analysis found that metaphors are 6% more influential than literal language in persuasion tasks (Sopory & Dillard, 2002).[4] Further research shows that metaphor-based interventions can have real-world outcomes. For example, people who are encouraged to think of their academic goals as the endpoint of a *journey* (as opposed to a contained *entity*) display more effort and achieve better grades in the classroom (Landau, Oyserman, Keefer, & Smith, 2014; see also Dweck, 2008).

But how, exactly, do metaphors shape thought? And what make some metaphors more influential than others? We address these questions below, highlighting the complex set of cognitive, affective, and social-pragmatic factors that moderate the power of metaphor (for a comprehensive review, see Ottati & Renstrom, 2010).

3.1 | Cognitive factors

Metaphors shape thought by tapping into structured knowledge of a source domain to help people organize and draw inferences about a target domain (Lakoff & Johnson, 1980; Thibodeau, Hendricks, & Boroditsky, 2017). For example, a target domain like the "U.S. political establishment" is complex, making it hard to think about. Trump's call to "drain the swamp" provides a comparatively simple way of thinking about Washington DC: as a murky place with dangerous creatures. The metaphor encourages people to make the inference that the U.S. political establishment can be removed—like water drained from a literal swamp—and that a Washington outsider like Trump may be the only one who can do it. In this way, people can leverage their knowledge of a more familiar, concrete source domain (e.g., swamps, beasts, and space) to reason about a more complex, abstract, or novel target domain (e.g., politics, crime, or time).

Metaphorical framing is most effective when the metaphor appears at the beginning, rather than the end, of a discussion (Sopory & Dillard, 2002; Thibodeau & Boroditsky, 2011). This is because people process language in real time, generating a dynamic representation of the content of the message as the conversation unfolds (Bever, 1970; Bransford & Johnson, 1972). When a metaphor appears early on, it activates the relevant source domain knowledge so that downstream information about the target domain can be assimilated into the familiar source domain structure (Thibodeau, Hendricks, & Boroditsky, 2017). When the metaphor only appears later on in conversation, the listener may have already come to construe the target domain in a particular way, attenuating any effect of the metaphorical comparison.

Likewise, metaphors are more persuasive when *extended* throughout the discussion—and into the language of a conceptually congruent response option—as this further encourages the listener to represent the target domain in terms of the source domain (Keefer, Landau, Sullivan, & Rothschild, 2014; Thibodeau, 2016). How much the listener already *knows* about a target domain also matters, however. Metaphors are most influential when the listener has an intermediate level of knowledge of the target domain: too little knowledge and they may fail to correctly map the source domain onto the target domain (Johnson & Taylor, 1981); too much knowledge makes the metaphor unnecessary and unlikely to change how people think about the target domain (Reuchamps, Dodeigne, & Perrez, 2018; Robins & Mayer, 2000).

3.2 | Affective factors

In some cases, the most salient feature of a metaphor is its emotional valence, rather than the structured knowledge it conveys (Bowers & Osborn, 1966; Hitchon, 1997; Johnson & Taylor, 1981; Reali, Soriano, & Rodríguez, 2016; Siltanen, 1981; Thibodeau, Crow, & Flusberg, 2017). For instance, metaphorically describing the flu as a *beast*, *riot*, *army*, or *weed* casts the flu in an especially negative and urgent light. One study found that describing the flu with one of these metaphors, rather than comparable literal language, made people more likely to get a flu shot (Scherer, Scherer, & Fagerlin, 2015). Similarly, calling for a *war* (as opposed to a *race*) against climate change leads people view climate change as more urgent, and to express a greater willingness to increase their conservation behavior (Flusberg et al., 2017; see also Matlock, Coe, & Westerling, 2017). Trump's swamp metaphor may be especially effective because the thought of a hot and dangerous swamp that is a breeding ground for dangerous

diseases can arouse feelings of anxiety and disgust, leading people to adopt Trump's negative attitudes toward the political establishment.

However, this affective component of metaphor has not received nearly as much attention as the cognitive mechanisms that support metaphor processing (Holyoak & Stamenković, 2018). Future research is needed to illuminate when, why, and how emotional valence and arousal moderate the power of metaphor.

3.3 | Social-pragmatic factors

Because metaphors are typically deployed in a social communicative context, they are most effective when they draw on knowledge that is shared between speakers and listeners (see research on common ground, for instance, Clark, 1996; Grice, 1964). Thus, it should come as no surprise that some of the most common metaphorical source domains include culturally familiar concepts like *family* and *war*, and universal bodily experiences like *space* and *containment* (Lakoff & Johnson, 1980, 1999).

Metaphors can also enhance the persuasive power of a message by capturing listener interest, enhancing impressions of the speaker, and encouraging further elaboration of the target of conversation (Gerrig & Gibbs, 1988; Gibbs & Gerrig, 1989; McGuire, 2000; Ottati & Renstrom, 2010). If the listener lacks relevant knowledge or interest in the source domain, however, a metaphor is less likely to influence their attitudes or behavior (Ottati & Renstrom, 2010). For example, one study found that sports metaphors were only persuasive for participants who liked sports (Ottati, Rhoads, & Graesser, 1999).

Finally, metaphors are also unlikely to affect people who have strong ideological commitments about the issue at hand (Landau, Keefer, & Rothschild, 2014; Thibodeau & Boroditsky, 2011; Thibodeau & Flusberg, 2017). For example, in the CRIME IS A BEAST/VIRUS study described in the previous section, Democrats and Independents, but *not* Republicans, were influenced by the metaphor frames; Republican participants were presumably already committed to enforcement-oriented solutions to crime and were therefore not swayed by a subtle framing manipulation (Thibodeau & Boroditsky, 2011). Future research should continue to explore the social and contextual cues that affect whether or not a particular metaphor is likely to be persuasive or useful as an explanatory model.

4 | CONCLUSIONS AND FUTURE DIRECTIONS

Whether or not you sympathized with Donald Trump's mission to *drain the swamp* (and whether or not you believe he succeeded), the metaphor shows us the power of metaphor in everyday communication and thought. Contrary to earlier, more limiting views of metaphor, we now know that metaphor plays a critical role in how we communicate and reason about novel, complex, and abstract subjects. Conventional metaphors really do seem to *reflect* how people think, and people readily recruit one domain to talk about and think about another. Still, some experiments suggest this may not *always* be the case, and not everyone agrees that embodied experience plays a significant role in the use and understanding of metaphor. There is broader consensus about the power of metaphor to *shape* thought and action, though the magnitude of these effects is fairly modest, and there are many factors that moderate the efficacy of metaphor framing.

Looking ahead, we join others who have called attention to the complex and dynamic nature of metaphorical language and thought (Gibbs & Colston, 2012; Holyoak & Stamenković, 2018), and we encourage researchers to embrace this complexity rather than ignore it. Future research should continue to disentangle the intricate web of cognitive, affective, and social-pragmatic factors that shape how people use, process, and respond to metaphors in everyday communication. And more researchers should embrace the burgeoning open science movement, which aims to increase the reliability and validity of scientific research and may help resolve some of the remaining controversies in the field (Finkel et al., 2015; Munafò et al., 2017; Shrout & Rodgers, 2018).

ENDNOTES

[1] The swamp metaphor for American politics actually goes back more than a century (Kelly, 2016) and may contribute to the myth that Washington, DC, was literally built on a swamp (see http://mallhistory.org/ explorations/show/was-the-national-mall-built-on).

[2] In place of the term "target," scholars sometimes use "tenor" and "topic"; in place of the word "source," scholars sometimes use "base" or "vehicle" (e.g., Black, 1962; Gentner & Wolff, 1997; Holyoak & Stamenković, 2018; Richards, 1936).

[3] These studies fall under the larger umbrella of "social priming" research in social psychology—the use of incidental stimulus primes to affect social judgments and behavior. See the edited volume by Molden (2014) for a comprehensive review and critique of this literature.

[4] This estimate is based on a meta-analysis of mostly laboratory studies in psychology and communications. Quantifying the persuasiveness of metaphoric versus literal language in the real world is more a challenging endeavor.

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