



Epistemic motives moderate the effect of metaphoric framing on attitudes



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HIGHLIGHTS

- Exposure to a metaphorically framed message uniquely influences attitudes.
- We test moderation by observers' prior motivation to interpret the target issue.
- Lay epistemology theory posits three motives: certainty, consistency, and accuracy.
- Metaphoric framing influenced target attitudes only when it served these motives.
- Findings illuminate when and why people rely on metaphor to think.

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ABSTRACT

People frequently encounter messages framing abstract sociopolitical issues (e.g., drug law enforcement) metaphorically in terms of superficially unrelated, more concrete concepts (e.g., military combat). These metaphoric framings are not mere figures of speech; instead, they prompt observers to interpret the target issue using their knowledge of the concrete concept, despite their surface differences. In this paper we examine how this effect is moderated by observers' motivation to think about the target issue. Integrating conceptual metaphor and lay epistemology theories, we propose that metaphor can satisfy three epistemic motives: to be certain, consistent, and accurate. Studies 1a–b provide preliminary evidence that participants exposed to a metaphoric framing transfer knowledge of a concrete concept (vehicle operation) to interpret a target issue (system failure). Studies 2 to 4 show that this effect holds only when the metaphoric framing serves an epistemic motive. Findings illuminate when and why people rely on metaphor to think.

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Commenting on a proposed oil pipeline that would further reliance on non-renewable energy sources, former Vice President Al Gore said, “Junkies find veins in their toes when their arms and legs go out” (Sheppard, 2013). This is an example of a metaphoric framing: a message comparing (typically by means of words or images) an abstract concept to a superficially unrelated concept that is relatively more concrete. Metaphoric framings are commonly used in public discourse (e.g., magazine editorials, political speeches, campaign ads) to communicate about controversial sociopolitical issues including terrorism (Kruglanski, Crenshaw, Post, & Victoroff, 2007), immigration (O'Brien, 2003), war (Lakoff, 1991), and abortion (for detailed qualitative analyses, see Charteris-Black, 2011; Musolff & Zinken, 2009). Experimental research shows that these messages are more than figures of speech:

they prompt observers to draw on their knowledge of the message's concrete concept (in the Gore example, drug addiction) to interpret the target issue (reliance on fossil fuels), even though the two concepts are quite different at a surface level.

Until now this research has assumed that metaphoric framings result in metaphor-consistent attitudes regardless of who is receiving the message. Yet that is unlikely because people are motivated to interpret information in particular ways. Lay epistemology theory (Kruglanski, 1989), a broad perspective on motivated social cognition, helps us to predict when metaphoric framings are most likely to influence attitudes. The theory identifies three epistemic motives that guide information processing: to be certain, consistent with prior attitudes, or accurate. The current studies test how each motive moderates metaphoric framing effects. In doing so, these studies advance understanding of the conditions under which people rely on metaphor to think (and not just talk) about concepts that lie at the center of social life.

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Conceptual metaphor theory and research

Our starting point is conceptual metaphor theory's claim that metaphor is not merely a communication device. Instead, it is a cognitive tool that people can use to understand an abstract or complex concept (called the "target") in terms of a dissimilar concept (the "source") that is relatively more concrete and easier to comprehend (Gibbs, 1994; Lakoff & Johnson, 1980).

Metaphor use facilitates understanding of the target by mentally mapping its features onto analogous features of the source. In this way, an accessible metaphor supports interpretations of the target that are consistent with knowledge of the source. More specifically, the metaphor transfers source knowledge in a way that highlights some target features and downplays others. For example, using metaphor to understand cancer recovery as a physical journey (Penson, Schapira, Daniels, Chabner, & Lynch, 2004) maps features of cancer recovery (the target) onto analogous features of goal-directed motion along a path (the source). This helps people to understand recovery as movement from a "starting point" (going to the doctor) to an intended "destination" (remission). And because they know that physical paths can be difficult to navigate, they can make sense of why they are enduring pain and uncertainty as their recovery progresses. Thinking about the same target in terms of an alternative source, or without a metaphor, would highlight different target features and support different interpretations.

Supporting this analysis, studies in cognitive psychology show that explicitly provided metaphors prompt people to transfer source knowledge to interpret a target. In one study (Gick & Holyoak, 1980), participants read a scenario in which an army successfully besieged a well-defended city by splitting up and surrounding it on all sides. They were then asked to solve a medical problem: how to focus enough radiation on a tumor to destroy it without damaging the surrounding tissue. The solution is to pass several weak emissions of radiation from multiple angles so that they converge on the tumor, with no one dose so concentrated to damage the surrounding tissue. Among the participants prompted to think back to the military scenario, 76% generated this solution, whereas only 10% of the control participants did so. Although the scenarios shared few similarities at a surface level, participants were able (with sufficient coaching) to transfer knowledge of the well-known scenario to process analogous features of the uncertain scenario.

Prior research: metaphoric framing influences attitudes

Social psychological research builds on this work and goes significantly further, demonstrating that even brief exposure to a metaphoric framing triggers metaphor use. Metaphoric framing research involves a relatively subtle procedure whereby participants are not explicitly asked to think about the target in terms of the source. Yet the use of metaphoric language can prompt people to bring their target attitudes in line with their knowledge of the source to which it is compared.

For example, participants who read a message framing the stock market as a living agent (e.g., "the NASDAQ started climbing upward") were more likely to infer that price trends would continue along their current trajectory compared to participants who read a message framing the stock market as an inanimate object ("the NASDAQ was swept upward"; Morris, Sheldon, Ames, & Young, 2007). Similarly, participants who read an article framing a city's crime problem as an aggressive animal supported punitive crime-reduction strategies more than those who read an article framing crime as a viral disease, who preferred to address the root causes of crime (Thibodeau & Boroditsky, 2011).

These effects are consistent with the hypothesized knowledge transfer process, even if these studies did not directly test this process. That is, participants exposed to an agent-metaphoric framing presumably transferred their knowledge of living agents (they move with intention) to interpret the target issue, while those presented with a disease-

metaphoric framing transferred their knowledge of curing disease (address root causes) to interpret the target issue. In fact, Thibodeau and Boroditsky (2011; Study 3) showed that priming the concepts "beast" or "virus" did not, in itself, influence participants' support for crime-reduction strategies; only when these concepts framed the target issue did participants exhibit source-consistent attitudes.

An important practical implication of this work is that metaphoric framings pervading public discourse have powerful but largely unrecognized consequences for how people make judgments and decisions about major sociopolitical issues. Yet it has so far assumed that observers exposed to a metaphoric framing passively adopt the relevant metaphor and apply it to interpret the target issue. This is unlikely to be the case, and an important next step is to model the person- and situation-level factors that moderate this effect.

Cognitive psychologists have already identified some factors constraining people's ability to successfully compare two concepts (Bowdle & Gentner, 2005; Glucksberg & Haught, 2006; Jones & Estes, 2006; Thibodeau & Durgin, 2011). Yet this research focuses on what persuasion researchers refer to as message characteristics, or aspects of the message's content (Hovland, Janis, & Kelley, 1953). For example, people are more likely to accept a metaphoric comparison if the target and the source are semantically close (e.g., comparing the Persian Gulf War to Vietnam: both are military interventions) versus remote (e.g., comparing the Persian Gulf War to an avocado). The current research is the first to examine moderation by observers' motivation to think about the target issue prior to metaphoric framing exposure.

The current research: epistemic motives and metaphor use

In many real-world contexts where people encounter metaphoric framings, such as in newspapers or online news sites, they are not neutral toward the target issues; rather, they desire particular types of knowledge. Kruglanski's (1989) theory of lay epistemology identifies three such epistemic motives. Integrating this framework with conceptual metaphor theory yields novel hypotheses about how each motive may moderate metaphoric framing effects.

Certainty motivation

Also called the need for nonspecific closure, this is the motive to seize on the first available judgment or decision without extensive effort. When this motive is high (e.g., in response to salient informational uncertainty), people do not have a strong preference for one interpretation over another; instead, they desire a simple, clear-cut interpretation regardless of the specific conclusions they reach (Kruglanski, 2004).

As noted earlier, conceptual metaphor theory posits that metaphor use helps people understand a target concept that they otherwise find uncertain. Combining these theories led us to hypothesize that when people have difficulty confidently understanding a sociopolitical issue (e.g., illegal drug regulation), they would seize on a metaphor comparing that issue to a concrete and familiar concept (e.g., enforcing drug laws protects society's "body" from sickness). More specifically, we predicted that metaphoric framing would produce source-consistent attitudes among observers induced to feel uncertain about the target issue, but not those who feel they already understand the issue. We test this hypothesis in Study 2 using a metaphoric framing procedure that we validate in Studies 1a and 1b (as explained below).

Consistency motivation

Also called the need for specific closure, this is the motive to maintain particular interpretations of a target issue that are consistent with previously held attitudes. Many studies show that people who hold strong attitudes on issues readily accept messages that support prior attitudes and reject messages that contradict them (Kruglanski, 2004; Lord, Ross, & Lepper, 1979).

On the basis of conceptual metaphor theory we hypothesized that metaphor use can help people to maintain prior attitudes. That is because the transfer of source knowledge selectively highlights some of the target's features and downplays others (Lakoff & Johnson, 1980). To illustrate, people who support federal oversight of the economy may embrace a metaphoric framing of the national economy as a vulnerable infant because the metaphor transfers their knowledge that an infant requires constant care to survive. Thus, metaphoric framing should produce source-consistent attitudes when the metaphor supports judgments that fit (versus contradict) observers' prior attitudes toward the target issue. We test this hypothesis in Study 3.

Accuracy motivation

People are motivated to accurately interpret an issue when they believe that a false judgment or a poor decision would have negative repercussions for themselves or others. Conceptual metaphor theory does not suggest a directional hypothesis about how accuracy motivation moderates metaphor use, as it does for certainty and consistency motivation. On the one hand, people who are concerned about an issue's societal impact may reject a metaphor, perceiving it as obscuring the issue's true nature by comparing it to a different type of thing. On the other hand, they may embrace a metaphor because it helps them to reason about the abstract issue in terms of something familiar, concrete, and well-known. Indeed, education research shows that students seeking to accurately grasp complex concepts are highly receptive to concretizing metaphors (Low, 2008). Thus, we tentatively hypothesized that metaphoric framing would produce source-consistent attitudes among observers with a high (versus low) concern about the target issue's societal impact. We test this hypothesis in Study 4.

Study 1a: Metaphoric transfer

All the current studies focus on the metaphoric framing of system failure (e.g., a failed company) as a vehicle accident. This framing commonly appears in political discourse (Hargreaves, 2013) and conventional English expressions such as “the economy is veering off course” and “our club is headed for a ditch” (Kövecses, 2010). People generally understand that a vehicle driver directs and controls a vehicle's direction and therefore is typically at fault for allowing the vehicle to stall, run off course, or crash. On the basis of prior metaphor theory and research, we expected that the vehicle-metaphoric framing would prompt observers to transfer this knowledge to interpret the causes of a system failure. This will support the judgment that blame for the system failure lies primarily with the high-ranking individual or institution in charge of total management of that system (the system's “driver”), and not with other relevant parties or situational factors. Because this implication is suggested by the metaphor, we expect this effect will occur even though the question of who or what is to blame for the system failure is not explicitly addressed in the message.

Before examining how this effect is moderated by epistemic motives (Studies 2–4), we attempted to go beyond prior metaphor research by providing empirical validation of this framing and its implications. First, in Study 1a, we directly tested whether metaphoric framing exposure prompts knowledge transfer. Our methodological approach was to measure individual differences in perceptions of a driver's blame for causing a vehicle accident, manipulate the framing of a company failure, and then measure attributions of blame for the company failure to three targets: The CEO in charge of the company, the company's former employees, and the conditions of the national economy.

Our first prediction was that, following exposure to the vehicle-metaphoric framing, the degree to which participants blame a driver for a vehicle accident would transfer over to positively predict CEO blame. In contrast, participants exposed to a nonmetaphoric framing would not transfer their vehicle knowledge (i.e., it would remain

irrelevant to interpreting system failure), so their driver blame perceptions would not predict CEO blame.

We assessed the discriminant validity of our predictor variables. If metaphoric framing prompts observers to map the target issue onto the source, then it should bring observers' target attitudes in line with their knowledge of that source as distinct from related concrete concepts. We measured, along with driver blame perceptions, perceptions of a home resident's responsibility for causing a destructive fire. Although the fire and vehicle accidents were both described as unforeseen misfortunes causing significant damage, we predicted that, in the vehicle-metaphoric framing condition, driver blame perceptions would positively predict CEO blame but resident blame perceptions would not.

To assess the discriminant validity of our outcome variables, we predicted that the vehicle-metaphoric framing would increase leader blame but would not increase a general tendency to blame other relevant parties (here, the company's employees) or situational factors (the conditions of the national economy).

Method

Participants were 100 adults (56% male; $M_{age} = 31.35$ ($SD = 10.01$); 55.4% White) recruited through Amazon's Mechanical Turk service (\$.75 compensation) to take part in a purported study of opinions about news events. The same cover story was used in all the current studies.

Driver and resident blame perceptions

Participants read a (fabricated) news article ostensibly taken from a local online news source. The article described an incident in which a car crashed into a power transformer, triggering “a major power outage” and causing significant damage to a city's power grid. Next they indicated their agreement with three items assessing the perception that the driver was responsible for the damages: “The driver is to blame for damaging the city's power grid”; “The accident was the driver's fault”; “The accident happened because of dangerous road conditions and weather” (reverse scored).

They also read a (fabricated) news article, ostensibly taken from a different local online news source, which described a house fire that “engulfed” a three-story home and caused significant damage to the neighborhood. Three items assessed the home's resident responsibility: “The resident is to blame for the damage caused by the fire”; “The fire was the resident's fault”; “The fire happened because of dangerous weather conditions” (reverse scored). Responses to these six items were made on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*) and were averaged to form composite scores of driver blame ($M_{grand} = 5.95$, $SD = 1.10$; $\alpha = .80$) and resident blame ($M_{grand} = 3.49$, $SD = 1.35$; $\alpha = .85$).

Framing manipulation and comprehension check

Next, participants read an excerpt from a (fabricated) news report on the bankruptcy of Micro-Processing Inc., a computer software company. The article identified the company's former CEO and mentioned negative consequences of the bankruptcy. Critically, however, it contained no information about the cause of company's failure:

“On February 10th, 2009 Richard Andersen, former CEO of Micro-Processing Inc. (MPI), announced that the company he ran was unable to pay its outstanding debts. MPI was one of the largest software company failures in American history. Over 25,000 employees lost their jobs, millions of investors lost all or almost all of their money, and economic markets around the world were affected”

Participants in the vehicle framing condition then read: “Many people have drawn an analogy between the bankruptcy of Micro-Processing Inc. and an automobile accident.” On the next screen were

items designed as a check that participants were able to correctly map the target's features onto analogous source features: "In this analogy the corporation of Micro-Processing Inc. is the _____. (*car**; *driver*; *passenger*; *none of the above*)"; "In this analogy Micro-Processing Inc.'s former CEO Richard Andersen is the _____. (*car*; *driver**; *passenger*; *none of the above*)".¹

Participants in the nonmetaphoric framing condition read: "Many people have described the bankruptcy of Micro-Processing Inc. as a negative event that had an array of harmful consequences." Two parallel comprehension check items followed: "Based on the information you read, in 2009 the company Micro-Processing Inc. _____. (*went bankrupt**; *changed its name*; *expanded*; *none of the above*)"; "Based on the information you read, what was Richard Andersen's position at Micro-Processing Inc.? (*Public Relations Officer*; *Lead Accountant*; *Chief Executive Officer**; *none of the above*)".

Blame attribution measure

Participants then responded to three sets of items assessing perceptions of blame for the company's failure. Each set focused on a specific target and included three items used in prior research (e.g., Rothschild, Landau, Molina, Branscombe, & Sullivan, 2013). The CEO blame items were: "Richard Andersen, the former CEO of Micro-Processing Inc., is to blame for the company going bankrupt; ...responsible for the company going bankrupt; ...at fault for the company going bankrupt." Parallel items assessed employee blame and economic conditions: "The former employees of Micro-Processing Inc. [The poor conditions of the national economy] are...to blame for the company going bankrupt; ...responsible for the company going bankrupt; ...at fault for the company going bankrupt" (1 = *strongly disagree*, 7 = *strongly agree*).

We created composite scores of CEO blame ($M_{grand} = 4.95$, $SD = 1.10$; $\alpha = .88$), employee blame ($M_{grand} = 2.62$, $SD = 1.40$; $\alpha = .95$), and economic conditions blame ($M_{grand} = 4.08$, $SD = 1.17$; $\alpha = .92$). The nine items were presented in a randomized order. We observed no main effects or interactions involving order.

Results

In this and the following studies, we originally performed our primary analyses including gender and age as between-subjects factors. In no study did we observe main effects of these factors on outcome measures, nor did they interact with our predictor variables. Including gender or age as covariates in our primary analyses did not significantly change the pattern of results for any reported effects. Because race/ethnicity representation in all samples was low, we did not test for main effects or interactions involving race/ethnicity. To simplify presentation of results, we do not mention these demographic variables further.

Leader (CEO) blame

To test our primary prediction regarding leader blame, we regressed CEO blame scores onto framing condition (vehicle versus nonmetaphoric; dummy coded), driver blame scores (continuous and centered), and their interaction. This analysis returned main effects of framing condition, $\beta = .19$, $SE = .22$, $t(96) = 1.91$, $p = .05$, and driver blame, $\beta = .39$, $SE = .15$, $t(96) = 2.65$, $p < .01$. These were qualified by the two-way interaction,

¹ Inspection of responses revealed that 92.7% of participants in Study 1a, and 100% of participants in Study 2, correctly answered all metaphor comprehension check items. This shows that, on the whole, participants were able to understand how a system failure conceptually maps onto a vehicle accident. We conducted Study 1a analyses after excluding participants who incorrectly answered at least one item. The results showed the same pattern when these participants' data are included in the analysis. We did not include the metaphor comprehension check items in Studies 1b, 3, and 4 in order to present a metaphoric framing how it typically appears in public discourse. In this way, these studies provide more ecologically valid tests of our hypothesis.

$\beta = .29$, $SE = .19$, $t(96) = 2.21$, $p = .03$, $R^2_{adj} = .10$. We plotted this interaction in Fig. 1 at one standard deviation above and below the centered driver blame mean (Aiken & West, 1991).

Simple slopes analysis showed that driver blame significantly and positively predicted CEO blame in the vehicle framing condition, $\beta = .38$, $SE = .14$, $t(96) = 2.88$, $p = .006$, but not in the nonmetaphoric framing condition, $\beta = -.04$, $SE = .14$, $t(96) = 0.27$, $p = .79$. Also supporting predictions, among participants high in driver blame (1 standard deviation above the centered mean), CEO blame was higher in the vehicle framing condition, $\beta = .43$, $SE = .29$, $t(96) = 3.17$, $p = .002$. Among low driver blame participants, in contrast, there was no simple effect of framing condition, $\beta = -.05$, $SE = .19$, $t(96) = .32$, $p = .75$.

Regressing CEO blame scores onto framing condition, resident blame scores, and their interaction returned the same framing condition main effect, $\beta = .25$, $SE = .22$, $t(96) = 2.59$, $p = .01$, but no resident blame main effect, $\beta = -.003$, $SE = .12$, $t(96) = 0.02$, $p = .98$, or interaction, $\beta = .05$, $SE = .17$, $t(97) = 0.41$, $p = .69$.

Employee and economic conditions blame

Regressing employee blame scores onto framing condition and driver blame returned a main effect of driver blame, $\beta = -.41$, $SE = .15$, $t(96) = 3.50$, $p < .001$, such that participants who blamed the driver more blamed employees less. However, there was no framing main effect, $\beta = -.04$, $SE = .26$, $t(96) = 0.51$, $p = .61$, or interaction, $\beta = -.08$, $SE = .23$, $t(97) = 0.66$, $p = .51$. Regressing economic condition blame scores returned no main effects of framing condition, $\beta = -.13$, $SE = .24$, $t(96) = 1.29$, $p = .20$, driver blame, $\beta = -.10$, $SE = .14$, $t(96) = .78$, $p = .44$, or their interaction, $\beta = .05$, $SE = .22$, $t(96) = 0.35$, $p = .73$.

Discussion

After reading a metaphoric framing of a company's bankruptcy as a vehicle accident, participants' prior perception that a vehicle's driver is responsible for causing an accident positively predicted their blaming of the company's CEO. If participants were not exposed to a vehicle-metaphoric framing, their driver blame perceptions did not predict CEO blame, suggesting that those concepts remained unrelated in their minds.

Supporting the discriminant validity of our predictor variables, participants' blaming of individuals for destructive accidents other than vehicle accidents did not predict CEO blame in either framing condition. This makes it unlikely that the vehicle-metaphoric framing simply licensed blame attributions among individuals who tend to blame others in general.

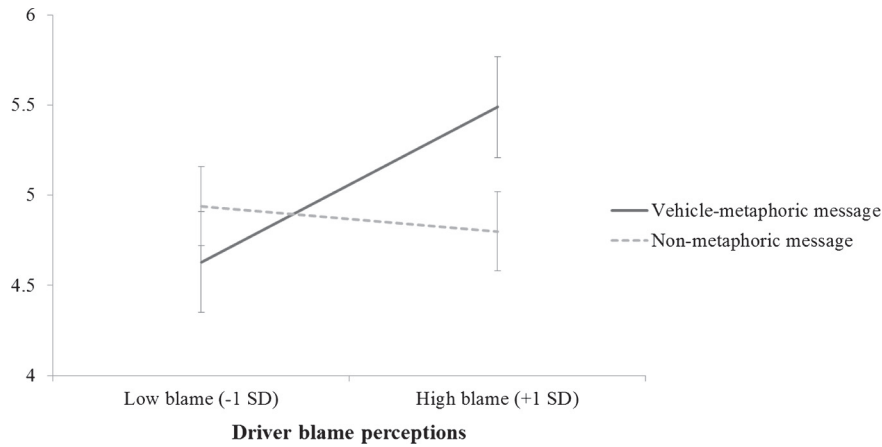
Supporting the discriminant validity of our leader blame measure, driver blame perceptions and framing condition did not interact to predict blaming of other relevant parties or situational factors; rather, they predicted the source-consistent judgment that blame for a system failure lies specifically with the system's "driver"—here, the company's CEO.

This is the first study (to our knowledge) to empirically validate the assumption underlying prior metaphoric framing research: Exposure to a metaphoric framing prompts observers to transfer their source knowledge to interpret analogous target features, supporting judgments that are both source-consistent and source-specific.

Still, because we compared a metaphoric and nonmetaphoric framing, the observed effect may be due to exposure to any metaphoric framing, perhaps because it is simply more vivid. Study 1b tests this alternative possibility.

Study 1b: Metaphor specificity

Study 1a provided evidence that individuals transfer knowledge about vehicle accidents to understand system failure when provided



Note: Scale range: 1-7. Higher scores indicate greater CEO blame.

Fig. 1. Attributions of blame to a company’s CEO for causing the company’s bankruptcy by framing condition (vehicle-metaphoric versus nonmetaphoric) and prior perceptions of a vehicle driver’s responsibility for causing an accident (continuous; Study 1a). Note: Scale range: 1–7. Higher scores indicate greater CEO blame.

with a metaphoric framing. However, people communicate about system failure using a variety of metaphors, likening it to an ailing person (“get the company back on its feet”) or a building collapse (“shaky foundations; finances in ruins”), among other concrete sources (Kövecses, 2010). Study 1b included a condition in which a company’s bankruptcy was framed metaphorically as a house destroyed by a storm. People generally know that home owners are not typically responsible for the destruction caused by a storm. Therefore, by including this condition we could test whether Study 1a’s main effect on CEO blame was the result of exposure to the vehicle-metaphoric framing specifically (as we expect) or whether any metaphoric framing would have this effect.

Method

Participants were 76 Mechanical Turk workers (47% male; $M_{age} = 37.10$ ($SD = 13.00$); 82% White; \$1.00 compensation). They read the same news excerpt about Micro-Processing Inc.’s bankruptcy used in Study 1a. Those in the vehicle framing and nonmetaphoric framing conditions read the framing sentences described in Study 1a. We omitted the metaphor comprehension check items to simplify the procedure and provide a stronger test of the framing effect. Participants in the

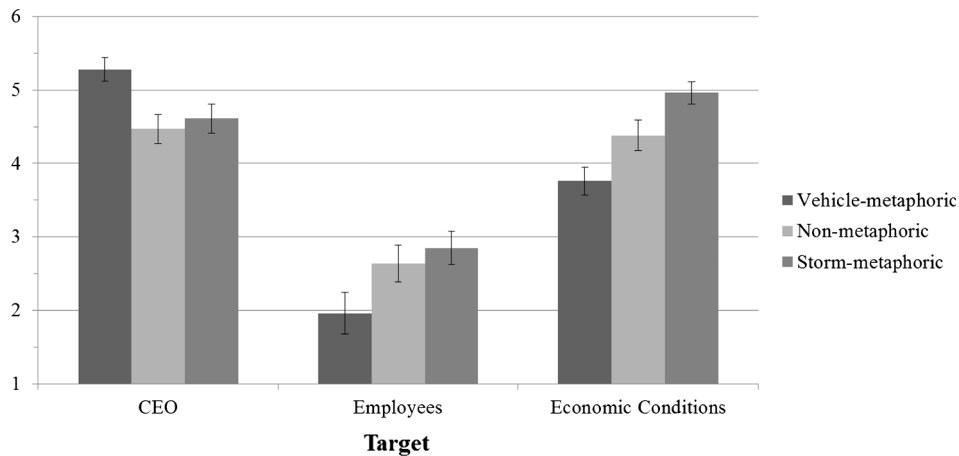
storm framing condition read: “Many people have drawn an analogy between the bankruptcy of Micro-Processing Inc. and a house being leveled by a storm.”

Participants then completed the nine items used in Study 1a to measure CEO blame ($M_{grand} = 4.81$, $SD = 1.18$, $\alpha = .94$), employee blame ($M_{grand} = 2.47$, $SD = 1.19$, $\alpha = .96$), and economic conditions blame ($M_{grand} = 4.35$, $SD = 1.12$, $\alpha = .93$). As in Study 1a, items were randomized and no order effects emerged.

Results

Leader (CEO) blame

Submitting CEO blame scores to a one-way ANOVA (framing condition) returned an omnibus effect, $F(2, 73) = 3.80$, $p = .03$, $\eta_p^2 = .09$. See Fig. 2 for the pattern of means. Pairwise comparisons (Fisher’s least significant difference) revealed, as predicted, that participants who read the vehicle framing blamed the CEO more ($M = 5.28$, $SD = .86$) than those who read the nonmetaphoric framing ($M = 4.47$, $SD = 1.47$, $p = .01$) and the storm framing ($M = 4.61$, $SD = 1.02$, $p = .04$). The latter two conditions did not differ ($p = .66$).



Note: Scale range: 1-7. Higher scores indicate greater blame.

Fig. 2. Blame attribution scores by target and framing condition (Study 1b). Note: Scale range: 1–7. Higher scores indicate greater blame.

Employee and economic conditions blame

Submitting employee blame scores to the same analysis also returned a framing effect, $F(2, 73) = 4.36, p = .02, \eta_p^2 = .11$. Participants who read the vehicle framing blamed employees less ($M = 1.96, SD = 1.05$) than those who read the nonmetaphoric framing ($M = 2.64, SD = 1.31, p = .04$) and the storm framing ($M = 2.85, SD = 1.05, p = .006$). The latter two conditions did not differ ($p = .51$).

Analyzing economic conditions blame also returned a framing effect, $F(2, 73) = 8.99, p = .0002, \eta_p^2 = .20$. Participants who read a vehicle framing blamed economic conditions less ($M = 3.77, SD = 1.05$) than those who read the nonmetaphoric framing ($M = 4.38, SD = 1.18, p = .04$). Interestingly, and not unexpectedly, participants who read the storm framing blamed economic conditions more ($M = 4.96, SD = .78$) than those who read the vehicle framing ($p < .0001$) and the nonmetaphoric framing ($p = .04$).

Discussion

Replicating Study 1a, participants exposed to a vehicle-metaphoric framing of a company's bankruptcy were more likely to blame that bankruptcy on the company's CEO, but not its former employees or the conditions of the national economy. Furthermore, the vehicle-metaphoric framing increased leader blame compared to a storm-metaphoric framing. Indeed, the storm-metaphoric framing had its own source-consistent effect, leading participants to assign more blame for the bankruptcy to broader economic conditions (i.e., the "storm"). This makes it unlikely that the predicted leader blame effect is simply due to exposure to any concrete metaphoric framing. Instead, the effect seems to be due to observers transferring vehicle knowledge to interpret analogous features of system failure.

Having validated our assumption that the vehicle-metaphoric framing prompts observers to transfer source-specific knowledge (Study 1a) in a manner unlike other concrete metaphoric framings (Study 1b), we now examine how this effect is moderated by the three epistemic motives identified by lay epistemology theory. Because we confirmed in two studies that this framing increases leader blame as distinct from a general tendency to blame other relevant parties and situational factors, we simplified the subsequent studies by focusing on leader blame as the outcome of primary interest.

Study 2: Certainty motivation

Study 2 tests whether certainty motivation—the desire for confident knowledge regardless of the specific conclusion reached—moderates the metaphoric framing effect replicated across Studies 1a and 1b. Many lines of research show that a reliable method for experimentally increasing certainty motivation is to make informational uncertainty about the target salient (Kahneman, Slovic, & Tversky, 1982). Drawing on this work, we manipulated whether or not participants contemplated uncertainties surrounding corporate bankruptcy.

On the basis of conceptual metaphor theory's claim that people use metaphor to comprehend otherwise uncertain concepts (Lakoff & Johnson, 1980), we made two predictions. First, participants primed with uncertainties about corporate bankruptcy would respond to a vehicle-metaphoric framing by feeling more confident that they understand that issue. Second, uncertainty-salient participants would be particularly likely to use the metaphor to interpret a target bankruptcy, assigning more responsibility to the company's CEO (as demonstrated in Studies 1a and 1b).

To test these predictions we switched from the regression approach employed in Study 1a to a factorial approach. In Study 1a we assumed that people generally believe that a vehicle's driver is primarily to blame for causing a vehicle accident. Consistent with that assumption, the grand mean for driver blame was high ($M = 5.95$) and the vehicle-metaphoric framing had a main effect on leader blame as people

transferred this inference to the target. Study 1a's regression approach capitalized on the fact that there was still some individual variability to test the hypothesized knowledge transfer process. Study 2 goes further to test whether the observed metaphoric framing main effect is moderated by situational variability in certainty motivation, and for this purpose a factorial design was appropriate.

Method

Participants were 212 Mechanical Turk workers (63.2% male; $M_{age} = 32.97 (SD = 10.28)$; 54.7% White; \$.75 compensation).

Uncertainty salience manipulation and check

Participants took what was purported to be a survey of knowledge about corporate bankruptcy. Those in the uncertainty salience condition responded to five multiple-choice questions that were difficult for most people to confidently answer: "At the start of the U.S. financial crisis in 2008, what was the first major financial corporation to fail and file for bankruptcy?" (*Merril Lynch; New Century Financial; American International Group; Bear Stearns; Not sure/Uncertain*); "Between 2010 and 2011 how many American corporations filed for bankruptcy?" (*15,534; 35,137; 49,895; 52,972; Not sure/Uncertain*); "According to bankruptcy code, which of the following is not a type of bankruptcy filing?" (*Chapter 7; Chapter 8; Chapter 9; Chapter 11; Not sure/Uncertain*); "According to U.S. bankruptcy law, relief is available under chapter 7 irrespective of the amount of the debtor's debts or whether the debtor is solvent or insolvent." (*True; False; Not sure/Uncertain*); "In the first five months of 2012, large corporations filing for bankruptcy laid off how many employees?" (*20,170; 32,500; 48,922; 65,003; Not sure/Uncertain*). They were told that if they were not sure, select the 'Not sure/Uncertain' option rather than guessing. Participants selected this option over 65% of the time.

Participants in the no uncertainty salience condition responded to five multiple-choice questions that were easily answered: "When large corporations fail and are unable to secure the funds to repay outstanding debts they commonly _____." (*file for bankruptcy; hire more employees; make no changes*); "When large corporations go bankrupt, national unemployment rates generally:" (*increase; decrease; stay the same*); "When a publicly traded corporation files for bankruptcy the price of its stock generally:" (*increases; decreases; stays the same*); "The bankruptcy of large corporations tends to _____ the economy." (*benefit; hurt; have no effect on*); "During the 2008 U.S. financial crisis the number of corporations filing for bankruptcy:" (*increased; decreased; stayed the same*).

As a check on the manipulation, we had participants respond to four items assessing their felt certainty about the nature of corporate bankruptcy: "I have a clear understanding of corporate bankruptcy"; "I feel confident that I could clearly explain corporate bankruptcy to someone else"; "I am uncertain what causes large corporations to go bankrupt" (reverse scored); "Corporate bankruptcy is too complex for me to understand it" (reverse scored) ($1 = strongly disagree, 7 = strongly agree; M_{grand} = 3.61, SD = 1.25; \alpha = .73$).

Framing manipulation and comprehension check

Next we manipulated framing and checked metaphor comprehension using the same materials and procedure as described in Study 1a.

Felt understanding measure

Three items assessed participants' perception that the message about Micro-Processing Inc. helped them to understand the company's bankruptcy: "How much did this message help you make sense of what happened to Micro-Processing Inc.?"; "How much did this message help you to understand what caused this corporation to go

bankrupt?"; "How much did this message help you to understand the consequences that this bankruptcy had for the economy?" (1 = *not at all*, 7 = *very much*; $M_{grand} = 4.28$, $SD = 1.37$; $\alpha = .78$).

Blame attribution measure

Finally, participants completed the same three items used in Studies 1a and 1b to assess blaming of the company's bankruptcy on its CEO ($M_{grand} = 4.83$, $SD = 1.08$; $\alpha = .89$).

Results

Uncertainty salience manipulation check

As expected, participants in the uncertainty salience condition felt less certain about corporate bankruptcy overall ($M = 3.23$, $SD = 1.18$) compared to those in the no uncertainty salience condition ($M = 4.00$, $SD = 1.21$; $F(1, 208) = 23.51$, $p < .001$, $\eta_p^2 = .10$).² We observed no framing main effect, $F(1, 208) = 0.08$, $p = .77$, $\eta_p^2 = .00$, or interaction, $F(1, 208) = 1.62$, $p = .20$, $\eta_p^2 = .008$ (as expected given that the manipulation check preceded the framing manipulation).

Felt understanding

We tested whether the vehicle framing bolstered participants' felt understanding of the target company's failure. A 2 (vehicle versus nonmetaphoric framing) \times 2 (uncertainty versus no uncertainty salience) ANOVA returned a two-way interaction, $F(1, 208) = 5.65$, $p = .02$, $\eta_p^2 = .03$ (for the framing main effect, $F(1, 208) = 0.49$, $p = .49$, $\eta_p^2 = .002$; for uncertainty salience, $F(1, 208) = 0.97$, $p = .33$, $\eta_p^2 = .005$). Fig. 3 depicts the means.

Pairwise comparisons (Fisher's least significant difference) revealed that participants primed with uncertainties about corporate bankruptcy, and then exposed to a vehicle framing of Micro-Processing Inc., felt more strongly that the message helped them understand that bankruptcy ($M = 4.64$, $SD = 1.23$) compared to participants in the no uncertainty/vehicle framing condition ($M = 4.00$, $SD = 1.31$; $F(1, 208) = 4.71$, $p = .03$, $\eta_p^2 = .02$) and the uncertainty/nonmetaphoric framing condition ($M = 4.05$, $SD = 1.47$; $F(1, 208) = 4.86$, $p = .03$, $\eta_p^2 = .02$).

In contrast, for participants not induced to feel uncertain about corporate bankruptcy, there was no difference in the perceived benefit of the vehicle versus nonmetaphoric message for understanding what happened to Micro-Processing Inc., $F(1, 208) = 1.37$, $p = .24$, $\eta_p^2 = .007$. Also, the nonmetaphoric framing did not differentially affect felt understanding between the uncertainty conditions ($M = 4.05$, $SD = 1.47$ versus $M = 4.32$, $SD = 1.34$; $F(1, 208) = 1.21$, $p = .27$, $\eta_p^2 = .006$).

Leader (CEO) blame

Submitting CEO blame scores to the same ANOVA returned a framing main effect, $F(1, 208) = 4.86$, $p = .03$, $\eta_p^2 = .02$, thus replicating Studies 1a and 1b (for the certainty main effect, $F(1, 208) = 0.09$, $p = .76$, $\eta_p^2 = .00$). The interaction was also significant, $F(1, 208) = 10.12$, $p = .002$, $\eta_p^2 = .05$. See Fig. 4.

As predicted, participants primed with bankruptcy uncertainties, and then exposed to the vehicle framing of Micro-Processing Inc.'s bankruptcy, attributed more blame over that bankruptcy to the company's former CEO ($M = 5.27$, $SD = 1.13$) compared to participants in the no uncertainty/vehicle framing condition ($M = 4.75$, $SD = .82$; $F(1, 208) = 5.08$, $p = .03$, $\eta_p^2 = .02$) and the uncertainty/nonmetaphoric framing condition ($M = 4.47$, $SD = 1.21$; $F(1, 208) = 14.89$, $p < .001$, $\eta_p^2 = .07$).

When bankruptcy uncertainties were not salient, however, CEO blame did not differ between the vehicle framing condition ($M = 4.75$, $SD = .82$) and the nonmetaphoric condition ($M = 4.90$, $SD = .95$; $F(1, 208) = 0.47$, $p = .50$, $\eta_p^2 = .002$).³

Discussion

Integrating conceptual metaphor and lay epistemology theories yields two predictions about how certainty motivation will moderate metaphorical framing effects, and the results of Study 2 supported both. First, participants induced to feel uncertain about the target issue, and subsequently exposed to a metaphoric framing of that issue, felt more confident that they understood that issue. In fact, somewhat surprisingly, these participants reported stronger felt understanding than participants who were not initially induced to feel uncertain. This finding provides, to our knowledge, initial experimental evidence supporting conceptual metaphor theory's claim that metaphor use helps people to understand concepts that they otherwise find uncertain.

Second, situational variation in certainty motivation moderated the metaphoric framing effect on target attitudes. Participants exposed to a vehicle-metaphoric (versus nonmetaphoric) framing of a company's bankruptcy were more likely to fault the company's CEO, but only if previously they were induced to feel uncertain about the nature of corporate bankruptcy. In short, when people are exposed to a metaphoric framing, they are more likely to employ the relevant metaphor to interpret the target issue if they are motivated to achieve a certain understanding of that issue. When certainty motivation is low, a metaphoric framing may be disregarded as merely figurative language. But what happens when the relevant metaphor supports judgments that conflict with observers' prior attitudes? Study 3 addresses this question.

Study 3: Consistency motivation

Extant metaphoric framing research would seem to suggest that observers passively use the relevant metaphor to interpret the target issue. Yet numerous studies of consistency motivation show that people selectively reject information that conflicts with their prior attitudes (Kruglanski, 2004). This led us to hypothesize that a metaphoric framing would not influence attitudes if the metaphor's implications are inconsistent with prior attitudes.

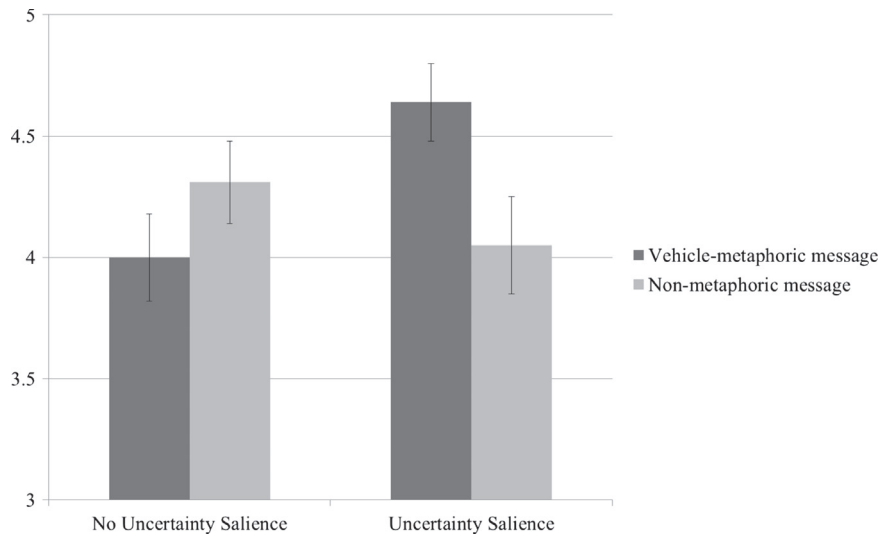
Testing this hypothesis requires a context in which participants have prior knowledge about the target issue, so we examined attitudes toward the 2008 financial crisis rather than a hypothetical company's bankruptcy. We predicted that participants exposed to the vehicle-metaphoric framing would assign more blame for the crisis to the economy's single governing institution—the federal government—but not if they previously held the attitude that no single individual or institution is to blame for that system failure. This attitude might be based on the belief that stock markets are volatile, economic trends operate in cycles, or, more likely, that blame for the crisis is distributed across many individuals and institutions.

We revised the metaphoric framing procedure to more closely approximate how such messages are encountered in public discourse. Instead of the explicit single sentences used thus far, participants read an article containing subtle vehicle-metaphoric expressions, a procedure shown to induce metaphoric understandings of a target issue (e.g., Landau, Sullivan, & Greenberg, 2009).

It is important to show that individual differences in prior attitudes predict participants' use of the relevant metaphor independent of

² We conducted a Levene's test for heterogeneity of variance for all primary analyses in Study 2. This analysis yielded no significant effects ($F_s < 2.40$, $p_s > .07$).

³ One unexpected result was that, in the nonmetaphoric framing condition, uncertainty-salient participants were less likely to blame the CEO ($M = 4.47$, $SD = 1.21$) compared to those not primed with uncertainty ($M = 4.90$, $SD = .95$), $F(1, 208) = 5.15$, $p = .02$, $\eta_p^2 = .02$. In hindsight this effect makes sense insofar as people who feel uncertain about why corporations go bankrupt should be less confident about blaming a CEO for his or her company's failure. In this case, uncertainty salience had divergent effects on CEO blame depending on whether a metaphor was salient.



Note: Scale range: 1-7. Higher scores indicate greater felt understanding of the target bankruptcy.

Fig. 3. Felt understanding of the target company's bankruptcy by framing condition and uncertainty salience (Study 2). Note: Scale range: 1–7. Higher scores indicate greater felt understanding of the target bankruptcy.

their attitudes toward the quality of the message or the credibility of its source. Therefore, we measured article and author attitudes to examine any such effects (we expected none).

Method

Participants were 144 undergraduates (55.6% male; $M_{age} = 18.78$ ($SD = .87$); 78.5% White) at a large Midwestern university who received course credit. In private cubicles, they completed study materials on computers (using MediaLab software; Jarvis, 2004).

No blame attitude

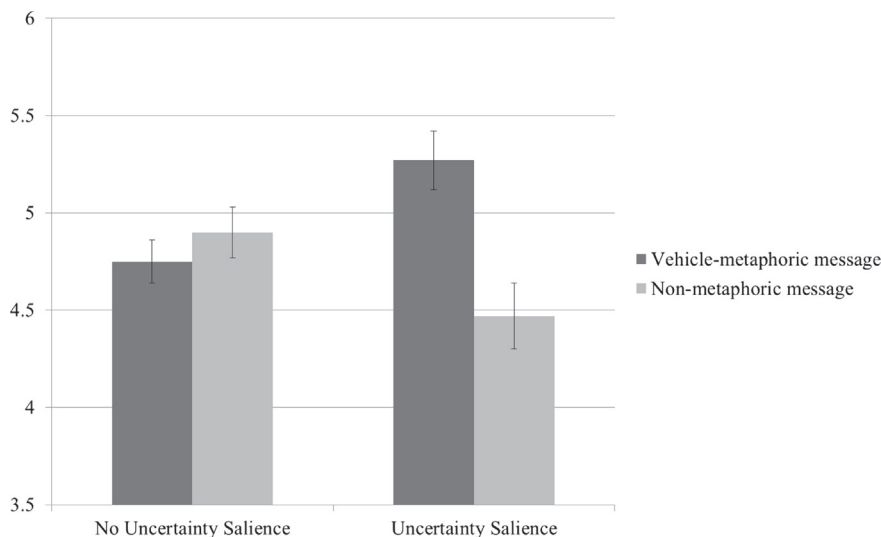
Embedded in filler questionnaires were three items that assessed participants' attitude that no single person or institution is to blame for the 2008 U.S. financial crisis: "No individual or organization is...to blame for the financial crisis; ...responsible for the financial crisis; ...at

fault for the financial crisis" (1 = *strongly disagree*, 7 = *strongly agree*; $M_{grand} = 3.79$, $SD = 1.64$; $\alpha = .97$).

Framing manipulation

Participants read a (fabricated) news article summarizing the 2008 U.S. financial crisis. The article described increased home foreclosures, unemployment, and debt, but did not explicitly identify a blameworthy source for the crisis. In the vehicle framing condition, the article contained expressions that subtly compared the financial crisis to a vehicle crash:

After a decade of *easy riding*, the U.S. economy *drove straight into a ditch* in 2008. Although some economists *saw the warning signs*, most Americans *didn't see the economy going off course*. The crisis began when the housing market declined, decreasing home prices. Homeowners rely on their homes for credit, so the combination of



Note: Scale range: 1-7.

Fig. 4. Attributions of blame to a company's CEO for causing the company's bankruptcy by framing condition and target uncertainty salience (Study 2). Note: Scale range: 1–7.

decreased home prices and risky, high interest loans brought a *rapid acceleration* of debt followed by a *pile-up* of foreclosures. Facing extremely high debt themselves, banks *hit the brakes* and stopped investing in new businesses. People stopped spending money, unemployment increased dramatically, and the economy *crashed*. [italics added]

In the nonmetaphoric framing condition, the article contained parallel expressions devoid of vehicle references:

After a decade of prosperity, the U.S. economy *entered a period of financial crisis* in 2008. Although some economists *predicted the crisis*, most Americans were *caught completely off guard*. The crisis began when the housing market declined, decreasing home prices. Homeowners rely on their homes for credit, so the combination of decreased home prices and risky, high interest loans *led to a sudden increase* in debt followed by *numerous* foreclosures. Facing extremely high debt themselves, banks *became more cautious* and stopped investing in new businesses. People stopped spending money, unemployment increased dramatically, and the economy *suffered a severe recession*. [italics added]

Article/author attitudes

Next was a five-item measure used in prior research (e.g., Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992) to assess liking for an article and its ostensible author: “How much do you like the author?”; “How intelligent did you think this person was?”; “How knowledgeable did you think this person was?”; “How much did you agree with this person’s opinion of the financial crisis?”; “From your perspective, how true do you think this person’s opinion of the financial crisis is?” (1 = *not at all*, 7 = *very much*; $M_{grand} = 4.86$, $SD = .92$; $\alpha = .89$).

Blame attribution measure

The three blame items used in the previous studies were modified to refer to the federal government’s culpability for the financial crisis: “The government is to blame for causing the financial crisis; ...responsible for the financial crisis; ...at fault for the financial crisis” (1 = *strongly disagree*, 7 = *strongly agree*; $M_{grand} = 3.78$, $SD = 1.36$; $\alpha = .93$).

Results

Leader (government) blame

Regressing government blame onto framing (vehicle versus nonmetaphoric; dummy coded), no blame attitude (continuous and centered), and their interaction returned the predicted two-way interaction, $\beta = -.28$, $SE = .13$, $t(140) = 2.43$, $p = .02$, $R^2_{adj} = .10$ (for the framing main effect, $\beta = .05$, $SE = .22$, $t(140) = 0.73$, $p = .47$; for no blame attitude, $\beta = -.08$, $SE = .10$, $t(140) = 0.76$, $p = .45$). We plotted the interaction in Fig. 5.

As predicted, simple slopes analysis showed that no blame attitude endorsement significantly and negatively predicted government blame in the vehicle framing condition, $\beta = -.48$, $SE = .09$, $t(140) = 4.32$, $p < .001$, $R^2_{adj} = .21$, but not in the nonmetaphoric framing condition, $\beta = -.09$, $SE = .10$, $t(140) = 0.76$, $p = .45$, $R^2_{adj} = .01$.

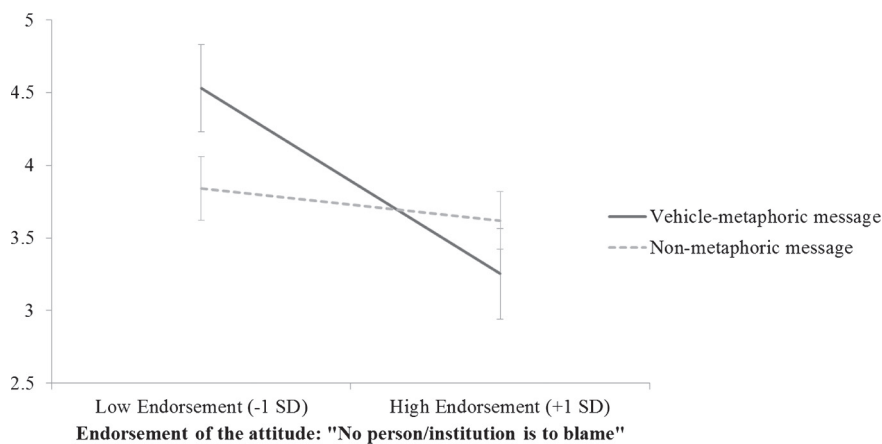
More interpretable is the finding that participants low in no blame attitude endorsement (one standard deviation below the centered mean) attributed more blame to the government in the vehicle framing condition than the nonmetaphoric framing condition, $\beta = .25$, $SE = .31$, $t(140) = 2.24$, $p = .03$, $d = .38$. In contrast, among those who strongly endorse a no blame attitude there was no simple effect of framing condition, $\beta = -.14$, $SE = .31$, $t(140) = 1.20$, $p = .23$, $d = .20$.

Article/author attitudes

To test the alternative possibility that the effect on leader blame was due to variation in participants’ attitudes toward the message or its ostensible author, we submitted article/author liking scores to the same regression analysis. We observed no main effects for framing condition, $\beta = .08$, $SE = .15$, $t(140) = 0.99$, $p = .32$, no blame attitude, $\beta = -.09$, $SE = .07$, $t(140) = 0.71$, $p = .48$, or their interaction, $\beta = .14$, $SE = .10$, $t(140) = 1.18$, $p = .24$. Furthermore, the predicted interaction effect on leader blame remained statistically significant ($p = .03$) when controlling for article/author liking.

Discussion

This study provides additional evidence that exposure to a metaphoric framing does not inevitably lead observers to interpret the target in terms of the source. In Study 2 this effect did not hold among observers who felt confident that they understood the target issue. Study



Note: Scale range: 1–7.

Fig. 5. Attributions of blame to the federal government for causing the 2008 financial crisis by framing condition and prior endorsement of no blame attitude (continuous; Study 3). Note: Scale range: 1–7.

3 provides the first evidence that this effect is eliminated if the relevant metaphor supports judgments that conflict with observers' prior attitudes.

Our predictor variables had no effects on attitudes toward the message itself or its author, suggesting that participants did not simply derogate the metaphoric message because they saw it as conflicting with their prior attitude toward the target issue. Rather, they appear not to have relied on the message's metaphor to interpret the target issue.

Study 4: Accuracy motivation

According to lay epistemology theory, people are sometimes motivated to think accurately about an issue, even if doing so entails uncertainty or conflict with prior attitudes. As noted in the Introduction, conceptual metaphor theory does not yield a strong a priori hypothesis about how accuracy motivation will moderate metaphoric framing effects. Yet pedagogical research shows that metaphor use satisfies accuracy motivation by grounding an otherwise abstract or complex concept (e.g., electric currents) in knowledge of a well-known source (e.g., running water; Low, 2008). Thus we tentatively predicted that metaphoric framing exposure would produce source-consistent effects on target attitudes particularly among observers desiring to accurately know the target issue (operationalized as concern over that issue's negative societal impact; Kruglanski, 2004), but not those who are relatively indifferent toward that issue.

This analysis yields a second prediction. If metaphor use in fact satisfies accuracy motivation, participants who are relatively more concerned about the target issue's harmful consequences should perceive a metaphoric framing as more helpful than a nonmetaphoric framing for understanding the actions necessary to prevent those consequences in the future.

Method

Participants were 203 undergraduates (54.7% male; $M_{age} = 18.79$ ($SD = .95$); 80.3% White) at a large Midwestern university who received course credit.

Concern over corporate bankruptcy

Embedded in filler questionnaires were three items assessing participants' concern over the harmful consequences of corporate bankruptcy: "I feel like corporate bankruptcy is a serious threat to the nation"; "I am very concerned about corporate bankruptcy"; "Corporate bankruptcy is scary" (1 = *strongly disagree*, 7 = *strongly agree*; $M_{grand} = 4.33$, $SD = 1.18$; $\alpha = .78$).

Framing manipulation

Participants read the article used in Studies 1a–b and 2 describing Micro-Processing Inc.'s bankruptcy. Next they read either the vehicle framing sentence or the nonmetaphoric framing sentence. As in Study 1b, we omitted the metaphor comprehension check items in order to replicate the framing effect using ecologically valid materials.

Felt accuracy measure

Next was a single, face-valid item assessing the perceived utility of the framing sentence for understanding how to prevent future corporate bankruptcies: "How much did this message help you think about what could be done to prevent similar company failures in the future?" (1 = *not at all*, 7 = *very much*; $M = 2.40$, $SD = 1.37$).

Blame attribution measure

We measured CEO blame for the bankruptcy using the same three items used in Studies 1a–b and 2 ($M_{grand} = 4.18$, $SD = 1.21$; $\alpha = .96$).

Results

Felt accuracy

Regressing felt accuracy onto framing condition, bankruptcy concern, and their interaction returned only the predicted interaction, $\beta = .22$, $SE = .16$, $t(199) = 2.21$, $p = .03$, $R^2_{adj} = .03$ (for the framing main effect, $\beta = -.02$, $SE = .27$, $t(199) = 0.20$, $p = .84$; for bankruptcy concern, $\beta = .08$, $SE = .12$, $t(199) = 0.78$, $p = .44$). See Fig. 6.

Bankruptcy concern significantly and positively predicted felt accuracy in response to the vehicle framing, $\beta = .22$, $SE = .12$, $t(199) = 2.26$, $p = .02$, $R^2_{adj} = .04$, but not the nonmetaphoric framing, $\beta = -.08$, $SE = .11$, $t(199) = 0.83$, $p = .41$, $R^2_{adj} = .007$. Also, participants with high concern (1 standard deviation above the centered mean) viewed the vehicle (versus nonmetaphoric) framing as supporting their accurate understanding of bankruptcy prevention, $\beta = .29$, $SE = .27$, $t(199) = 2.93$, $p = .004$, $d = .42$. In contrast, framing condition did not influence felt accuracy among those with a low concern, $\beta = -.02$, $SE = .27$, $t(199) = 0.21$, $p = .84$, $d = .03$.

Leader (CEO) blame

Submitting CEO blame ratings to the same regression analysis returned a framing condition main effect, $\beta = .14$, $SE = .16$, $t(199) = 2.08$, $p = .04$, replicating Studies 1a–b and 2. It also returned the predicted interaction, $\beta = .28$, $SE = .14$, $t(199) = 2.80$, $p = .006$, $R^2_{adj} = .08$ (for the bankruptcy concern main effect, $\beta = .007$, $SE = .10$, $t(199) = 0.07$, $p = .94$).

As seen in Fig. 7, bankruptcy concern significantly and positively predicted CEO blame in the vehicle framing condition, $\beta = .42$, $SE = .09$, $t(199) = 4.56$, $p < .001$, $R^2_{adj} = .17$, but not in the nonmetaphoric framing condition, $\beta = .007$, $SE = .10$, $t(199) = 0.68$, $p = .95$, $R^2_{adj} = -.01$.

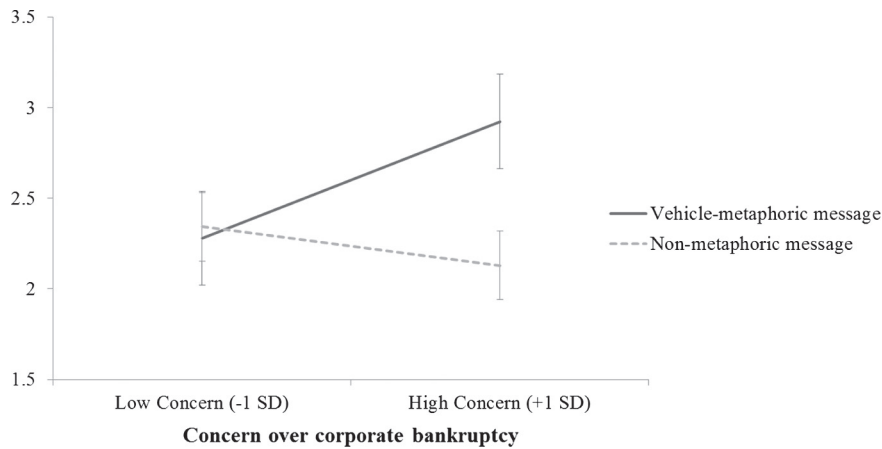
High concern participants blamed the bankrupt company's former CEO more in the vehicle framing condition than the nonmetaphoric framing condition, $\beta = .33$, $SE = .23$, $t(199) = 3.46$, $p = .001$, $d = .49$. Yet framing had no impact on CEO blame among participants who were relatively unconcerned about bankruptcy's negative societal impact, $\beta = -.05$, $SE = .23$, $t(199) = 0.52$, $p = .61$, $d = .14$.

Discussion

When participants highly concerned about the harmful impact of corporate bankruptcy encountered a message metaphorically framing a company's bankruptcy as a vehicle accident (versus without a metaphor), they felt they had a more accurate sense of what needs to be done to prevent future corporate bankruptcies. They were also more likely to blame that bankruptcy on the company's leader, suggesting that they were more likely to draw on their knowledge of vehicle accidents to interpret the causes of system failure. These effects were absent among participants less concerned about bankruptcy's societal impact, supporting our hypothesis that metaphoric framing effects are attenuated when accuracy motivation is low.

General discussion

Newspapers, magazines, websites, and television are replete with messages framing practically important sociopolitical issues in terms of superficially unrelated, typically more concrete concepts. In prior studies, exposure to these metaphoric framings led observers to bring their attitudes toward the target issue in line with their (presumed) knowledge about the concrete source. The current Study 1a conceptually replicates



Note: Scale range: 1–7.

Fig. 6. Perceived utility of the message for understanding how to prevent corporate bankruptcies by framing condition and concern over corporate bankruptcy's negative consequences (continuous; Study 4). Note: Scale range: 1–7.

these studies and, by measuring (rather than presupposing) source knowledge, goes one step further to demonstrate that metaphoric framing exposure prompts observers to transfer source knowledge to interpret analogous aspects of the target issue. Study 1b showed that this effect results from exposure to a specific metaphor and not simply any metaphoric message.

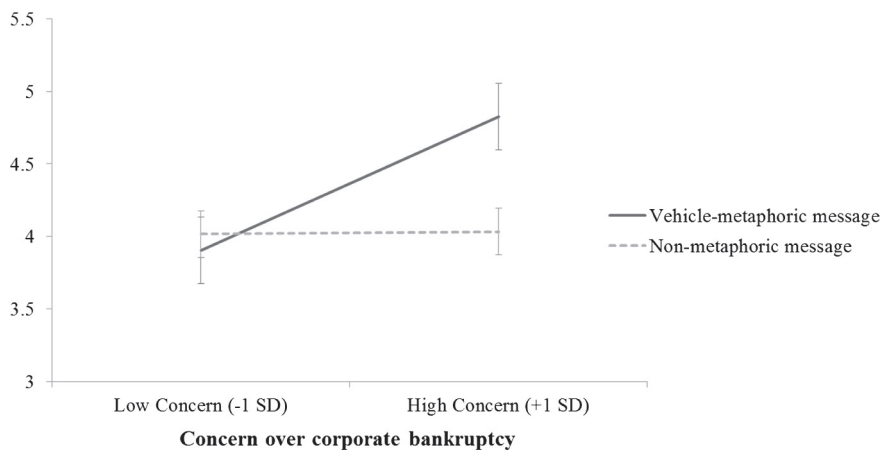
We then turned to our primary research question: Does metaphoric framing have different effects depending on how observers are motivated to think about the target issue? Lay epistemology theory suggests three such motives: to be certain, maintain consistency with prior attitudes, and be accurate. We drew on conceptual metaphor theory to formulate hypotheses about how metaphor might serve each of these motives. Supporting these hypotheses, metaphoric framing produced source-consistent target attitudes only if: participants were previously primed to feel uncertain about the target issue (Study 2); the metaphor's implications were consistent with (versus inconsistent with) prior attitudes toward the target (Study 3); and participants were concerned (versus apathetic) about the issue's repercussions for society (Study 4).

By illuminating how epistemic motives moderate metaphoric framing effects, these findings contribute to a fuller picture of the individual and situational factors that determine people's reliance on metaphor to think about issues of practical concern.

Theoretical contributions

The current research advances contemporary theory and research on metaphor (for review, see Landau, Meier, & Keefer, 2010; Landau, Robinson, & Meier, 2013) by building on an established theory of epistemic motivation to provide the first programmatic study of the cognitive functions that metaphor use serves the individual.

This work also contributes to a wider recognition of the cognitive mechanisms that underlie attitudes. From the perspective of mainstream attitude theory, people's attitudes toward a target are based primarily on their accumulated knowledge of that target and related stimuli. This knowledge is organized in a mental structure usually referred to as a *schema*. Thus, for example, a person's attitude toward immigration is based on her schema specifically for immigration. While schemas are insular, they are not isolated: research demonstrates that the activation of a schema can spread to activate other thoughts—even those that appear superficially unrelated—that can be associated through repeated pairings over time (Collins & Loftus, 1975). Yet these associative links are essentially idiosyncratic: a person's immigration schema may activate memories of her 5th grade geography teacher, yet the target-specific schema is attributed sole influence over any relevant attitudes.



Note: Scale range: 1–7.

Fig. 7. Attributions of blame to a company's CEO for the company's bankruptcy by framing condition and concern over corporate bankruptcy's negative consequences (continuous; Study 4). Note: Scale range: 1–7.

The emerging literature on conceptual metaphor offers the complementary insight that people's attitudes toward a social stimulus can also be *systematically* structured by their knowledge of different types of stimuli. Although the United States and one's body, for example, share few surface similarities, people may use their schematic knowledge of how bodies respond to foreign bacteria as a framework for forming attitudes about how their country is affected by immigrants (Landau et al., 2009). Metaphoric influences can thus be understood as a type of spreading activation, but of a particular kind hitherto unappreciated in traditional schema-based models of attitudes.

We propose that demonstrations of source-consistent target attitudes, of the kind reported here and in similar studies reviewed earlier, provide particularly strong evidence that individuals do in fact use metaphor to interpret target issues (for further discussion, see Ottati, Renstrom, & Price, 2013). The primary claim of conceptual metaphor theory is that metaphor use involves a systematic mapping between analogous aspects of dissimilar concepts. For example, in the metaphor *life is a journey*, the mapping links goals to destinations, challenges to obstacles, and so on. Based on this claim we would expect that, when portions of a metaphor's mapping are made salient, people will transfer other pieces of source knowledge to interpret analogous aspects of the target. In this way, the metaphor can shape interpretations of target aspects that are not explicitly mentioned in the original message conveying that metaphor.

Consistent with this empirical approach, vehicle-metaphoric messages used in the current studies gave no information about the cause of the system failure (i.e., corporate bankruptcy in Studies 1a–b, 2, and 4; the 2008 financial crisis in Study 3). They referred instead to other correspondences between features of vehicles and system failures, such as the link between a company and a car. That exposure to this metaphor led people to transfer their knowledge of vehicle driver responsibility to interpret system failure responsibility (Study 1a) in ways that are distinct from other metaphors (Study 1b) provides strong evidence that metaphors operate as systematic conceptual mappings that can significantly shape target attitudes. In short, by means of metaphor people sometimes conceptualize social concepts in terms of superficially unrelated concepts and experiences.

Limitations

Because the current studies focused on a single metaphor (system failure is a vehicle crash) as a case study, it is possible that our findings are somehow limited to that metaphor and would not be obtained if we had examined alternative metaphors. We believe that this metaphor does have a somewhat unique influence on increased blame attribution because a focal target is responsible for vehicle operation. But the more general finding that metaphoric framing exposure produces source-consistent target attitudes is by no means unique to this metaphor. In this article we reviewed a number of studies showing the same basic effect using a range of metaphors. Given that all conceptual metaphors are theorized to serve the same epistemic motives, we have no reason to believe that variations in these motives would not moderate the use of other metaphors in other contexts.

Similarly, it is worth noting that increased blame attributions are potentially only one entailment, or inference, supported by the vehicle metaphor. Recall that the metaphor supports the inference that the high-ranking individual or institution managing a system is responsible for the system's functioning. Thus, people using this metaphor might be especially likely to praise the chief individual/institution for preventing a faltering system from failing (i.e., by "switching gears, changing lanes and getting back on course"). Also, our studies focus on a situation where system failure is undesirable, yet there are clearly situations where it is desirable. For example, Martin Luther King repeatedly employed journey and vehicle metaphors in his speeches and writings to describe the gradual disabling of a deeply-entrenched system of racial

segregation (Charteris-Black, 2011). This metaphor may have contributed to King's image as a key figure in dismantling this oppressive system.

The current studies also focused on the consequences of metaphoric framing exposure within the context of political communication. We made this choice because metaphors are pervasive in political discourse and may exert a significant yet often overlooked impact on the judgments and decisions that affect people's lives. Yet these framings are also ubiquitous in consumer advertising, interpersonal persuasion, educational materials, courtroom proceedings, psychotherapy, and health discourse (e.g., Gibbs, 2008; McMullen & Conway, 1996; Reifeld & Wilson, 2004; Sontag, 1978). Based on our theoretical analysis, we expect metaphoric framing exposure in these other contexts to produce metaphor-consistent perceptions and attitudes, particularly when the provided metaphor satisfies one of the three epistemic motives identified by lay epistemology theory.

We measured, rather than manipulated, consistency motivation (via prior endorsement of beliefs about the target system's failure) and accuracy motivation (via prior concern over the societal impact of the system's failure). This design limits our ability to make definitive conclusions about the causal impact of these epistemic motives in moderating metaphoric framing effects. It will be important for future research to replicate our findings using procedures for situationally increasing these motives (see Kruglanski, 2004).

Nevertheless, we believe that there is a strong empirical precedent for this design. Some of the field's most robust and influential demonstrations that consistency motivation shapes information processing come from studies showing that prior attitudes bias attention to, and acceptance of, information that confirms or contradicts those predispositions (Hastorf & Cantril, 1954; Janis, 1982; Lord et al., 1979; Moscovici & Zavalloni, 1969; Myers, 1982). The same holds true for accuracy motivation. A number of influential studies show that people's motivation to think carefully about a message depend on the message's perceived relevance to their personal goals, concerns, and interests (e.g., Petty, Cacioppo, & Schumann, 1983).

Also, this design has the benefit of enhancing metaphor research by shedding light on the role of individual differences in metaphor use. This topic has received little empirical attention (Robinson & Fetterman, 2013), and the little work that does exist tends to focus on personality traits (Moeller, Robinson, & Zabelina, 2008) rather than pre-existing attitude endorsement.

Future directions

Future research on the persuasive influence of metaphor should further consider the role of *message*, *source*, and *audience* characteristics that may play an important role.

Message

Metaphor plays a crucial social role in communicating about controversial sociopolitical issues, and is therefore vital to political discourse. But metaphor is not the only rhetorical strategy used in political communication to arouse audience interest or change people's hearts and minds. Other strategies include narratives, analogies, anecdotes, rhetorical questions, Biblical or literary allusions, and modes of discourse such as irony and sarcasm. We have isolated metaphor for the purpose of studying its persuasive impact, but future research should examine the interplay between metaphor and other rhetorical strategies.

According to Charteris-Black (2011), using various strategies in combination is especially persuasive because it conceals the contribution of any single strategy, and thus avoids alerting the audience's reactance to being manipulated or exploited. For example, systems of metaphors can be integrated into overarching narratives to enhance persuasive impact. To illustrate, he articulates how Winston Churchill's World War II public addresses masterfully interwove metaphors and narrative to dramatically portray the United Kingdom and its allies as locked in a mythic battle of Good and Evil—a narrative that

strengthened national unity and stoked patriotic fervor. Future laboratory research could assess this type of claim by testing whether metaphor is more effective when it acts in combination with other rhetorical strategies rather than in isolation.

We have focused on the potential for metaphors to highlight certain aspects of the target issue—in this case the responsibility of a system's chief party. But metaphor use also has the ability to conceal ideas. For example, metaphorically comparing military victory to a “score” in a point-based game downplays war's qualitative costs in human suffering and the destruction of life-supporting infrastructure (Lakoff, 1991). As another example (adapted from Charteris-Black, 2011, p. 36), when British Prime Minister Harold Macmillan stated that “the wind of change is blowing through this continent,” he may have concealed agency and represented change as if it were inevitable because of the limits of control we have over natural processes (such as storms, as shown in current Study 1b).

Source

A persuasive communication's efficacy depends on factors such as the perceived credibility and attractiveness of the communicator. How does metaphor interact with these factors? Imagine, for example, that people are presented with a metaphor that makes political actions and situations intelligible (satisfying certainty motivation) and in a way that fits their previous experience and assumptions about the world (consistency motivation), but its source is an unattractive or untrustworthy speaker. People may employ the metaphor regardless of these attributes in order to meet their epistemic needs, or they might dismiss it despite the benefits it provides.

Audience

We have seen that the epistemic motives held by audience members moderate their use of a provided metaphor to interpret a target issue. However, there are other audience characteristics that may enhance or attenuate the effectiveness of metaphor in rhetoric. Idiosyncratic differences in source knowledge based on experience or environment, for example, will obviously result in different interpretations of the same metaphoric communication.

Other cognitive processes may play a role in metaphor processing. For example, individual differences in the ability to map abstract metaphors may moderate their effectiveness. Metaphors that seem difficult for a person to map are unlikely to influence attitudes, whereas more creative, motivated, or receptive audiences may work through a difficult metaphor to form the associations intended by a communicator.

Practical implications

As we noted earlier, metaphoric framings are commonly used in public discourse to communicate about issues that affect people's lives, such as the economy, terrorism, and war. They can be found in campaign slogans, consumer advertisements, news reports, educational materials, and the courtroom. Research is beginning to show that these communications are more than colorful figures of speech or imagistic tropes; instead, they lead people to unconsciously recruit their knowledge of a source to interpret a target issue, despite their superficial differences. And, practically speaking, it is important to note that metaphors may influence not only the evaluation of past action, as we have focused on, but also people's decisions about future action such as, for example, whether to make peace or to go war.

This suggests that these widespread communications have powerful but largely unrecognized consequences for how people make judgments and decisions about practically important matters. For one, exposure to these messages can bias people's attitudes toward abstract issues by leading them to base their attitudes on knowledge of irrelevant yet familiar concrete concepts, without due consideration of the unique attributes of target issues. The practical implication is that interventions designed to reduce bias in attitudes should pay particular

attention to the analogies that individuals and groups use to frame discourse (a project already begun; see Kruglanski et al., 2007; Lakoff, 1991, 2004).

Indeed, some metaphors are so conventional (e.g., by repeated media exposure) that recipients may not immediately recognize them as metaphors. They may interpret them instead as simply the conventional way of talking about a political issue. Thus, perhaps the first step in increasing the public's consciousness of metaphor's persuasive pull would be to educate them on what a metaphor is, and what it is not. For example, at least since U.S. president Richard Nixon declared a “war on drugs” in 1971, discourse surrounding illegal drug regulation has consistently drawn on elements of military combat, and individuals fed a steady diet of these metaphors may fail to fully appreciate that such messages are, in fact, metaphoric, and may offer a partial or skewed picture of the focal issue.

Inquiring into the metaphors used to frame sociopolitical issues may also promote constructive political dialogue, since it is plausible that partisan gridlock occurs in part because parties employ incompatible metaphors to structure how they understand and form attitudes about those issues. In fact, Study 4 showed that the higher the stakes get on a social issue, the more people will cling to metaphors that provide a sense of accuracy, even if those metaphors may lead to faulty decision making or miscommunication across party lines.

For a democracy to effectively represent the interests of all citizens, those citizens must form and express informed, personal views about important political issues. An appreciation of the persuasive power of metaphor points to the sobering reality that this task is even harder than it first appears. Not only do people have to appreciate the realities of an important issue, but they have to be cautious about whether that issue is mapped on to a very different type of concept in a misleading way. Metaphor has a seductive ability to organize information about political issues around emotionally evocative experiences, familiar myths, and seemingly incontestable bits of ideology. Yet because these carry their own, largely unconscious cognitive and affective associations, they may be irrelevant for understanding the issue at hand and solving problems. The current findings suggest that the public should be particularly ‘on guard’ for unproductive metaphors when they are motivated to gain any confident grasp of an issue, when they lack strong prior attitudes, and when they are concerned with the repercussions of that issue for themselves and society.

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References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Bowdle, B. F., & Gentner, D. (2005). The career of metaphor. *Psychological Review*, *112*, 193–216.
- Charteris-Black, J. (2011). *Politics and rhetoric: The persuasive power of metaphor* (2nd ed.). New York: Palgrave Macmillan.
- Collins, A.M., & Loftus, E. (1975). A spreading-activation theory of semantic processing. *Psychological Review*, *82*, 407–428.
- Gibbs, R. W. (1994). *The poetics of mind: Figurative thought, language, and understanding*. Cambridge: Cambridge University Press.
- Gibbs, R. W. (2008). *The Cambridge handbook of metaphor and thought*. New York: Cambridge University Press.
- Gick, M. L., & Holyoak, K. J. (1980). Analogical problem solving. *Cognitive Psychology*, *12*, 306–355.
- Glucksberg, S., & Haught, C. (2006). Can Florida become like the next Florida?: When metaphoric comparisons fail. *Psychological Science*, *17*, 935–938.
- Greenberg, J., Simon, L., Pyszczynski, T., Solomon, S., & Chatel, D. (1992). Terror management and tolerance: Does mortality salience always intensify negative reactions to others who threaten one's worldview? *Journal of Personality and Social Psychology*, *63*, 212–220.
- Hargreaves, S. (June 19th, 2013). Fed sets road map for end of stimulus. Retrieved from www.money.cnn.com

- Hastorf, A. H., & Cantril, H. (1954). They saw a game: A case study. *Journal of Abnormal Psychology*, 49, 129–134.
- Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion: Psychological studies of opinion change*. New Haven, CT: Yale University Press.
- Janis, I. L. (1982). *Groupthink: Psychological studies of policy decisions and fiascoes* (2nd ed.). Boston: Houghton Mifflin.
- Jarvis, B. G. (2004). *MediaLab (version 2004) [computer software]*. New York, NY: Empirisoft Corporation.
- Jones, L. L., & Estes, Z. (2006). Roosters, robins, and alarm clocks: Aptness and conventionality in metaphor comprehension. *Journal of Memory and Language*, 55, 18–32.
- Kahneman, D., Slovic, P., & Tversky, A. (Eds.). (1982). *Judgment under uncertainty: Heuristics and biases*. New York: Cambridge University Press.
- Kövecses, Z. (2010). *Metaphor: A practical introduction*. New York: Oxford University Press.
- Kruglanski, A. W. (1989). *Lay epistemics and human knowledge: Cognitive and motivational bases*. New York: Springer.
- Kruglanski, A. W. (2004). *The psychology of closed mindedness*. New York: Taylor & Francis Books.
- Kruglanski, A. W., Crenshaw, M., Post, J. M., & Victoroff, J. (2007). What should this fight be called? Metaphors of counterterrorism and their implications. *Psychological Science in the Public Interest*, 8, 97–133.
- Lakoff, G. (1991). Metaphor and war: The metaphor system used to justify war in the Gulf. In B. Hallet (Ed.), *Engulfed in war: Just war and the Persian Gulf*. Honolulu: Matsunaga Institute for Peace.
- Lakoff, G. (2004). *Don't think of an elephant: Know your values and frame the debate. The essential guide for progressives*. White River Junction, VT: Chelsea Green Publishing Company.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.
- Landau, M. J., Meier, B. P., & Keefer, L. A. (2010). A metaphor-enriched social cognition. *Psychological Bulletin*, 136, 1045–1067. <http://dx.doi.org/10.1037/a0020970>.
- Landau, M. J., Robinson, M.D., & Meier, B. P. (2013). *The power of metaphor: Examining its influence on social life*. Washington, D. C.: APA Press.
- Landau, M. J., Sullivan, D., & Greenberg, J. (2009). Evidence that self-relevant motives and metaphoric framing interact to influence political and social attitudes. *Psychological Science*, 20, 1421–1427. <http://dx.doi.org/10.1111/j.1467-9280.2009.02462.x>.
- Lord, C., Ross, L., & Lepper, M. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37, 2098–2109.
- Low, G. (2008). Metaphor and education. In R. W. Gibbs (Ed.), *The Cambridge handbook of metaphor and thought* (pp. 212–231). New York: Cambridge University Press.
- McMullen, L. M., & Conway, J. B. (1996). Conceptualizing the figurative expressions of psychotherapy clients. In J. S. Mio, & A. Katz (Eds.), *Metaphor: Implications and applications* (pp. 59–71). Mahwah, NJ: Lawrence Erlbaum Associates.
- Moeller, S. K., Robinson, M.D., & Zabelina, D. L. (2008). Personality dominance and preferential use of the vertical dimension of space: Evidence from spatial attention paradigms. *Psychological Science*, 19, 355–361. <http://dx.doi.org/10.1111/j.1467-9280.2008.02093.x>.
- Morris, M. W., Sheldon, O. J., Ames, D. R., & Young, M. J. (2007). Metaphors and the market: Consequences and preconditions of agent and object metaphors in stock market commentary. *Organizational Behavior and Human Decision Processes*, 102, 174–192. <http://dx.doi.org/10.1016/j.obhdp.2006.03.001>.
- Moscovici, S., & Zavalloni, M. (1969). The group as a polarizer of attitudes. *Journal of Personality and Social Psychology*, 12, 125–135.
- Musolff, A., & Zinken, J. (2009). *Metaphor and discourse*. New York: Palgrave Macmillan.
- Myers, D.G. (1982). Polarizing effects of social interaction. In H. Brandstatter, J. H. Davis, & G. Stocher-Kreichgauer (Eds.), *Contemporary problems in group decision-making* (pp. 125–161). New York: Academic Press.
- O'Brien, G. V. (2003). Indigestible food, conquering hordes, and waste materials: Metaphors of immigrants and the early immigration restriction debate in the United States. *Metaphor and Symbol*, 18, 33–47.
- Ottati, V. C., Renstrom, R. A., & Price, E. (2013). The metaphorical framing model: Political communication and public opinion. In M. Landau, M. Robinson, & B. Meier (Eds.), *The power of metaphor: Examining its influence on social life*. Washington, DC: APA Press (pp. xx–xx).
- Penson, R. T., Schapira, L., Daniels, K. J., Chabner, B.A., & Lynch, T. J. (2004). Cancer as metaphor. *The Oncologist*, 9, 708–716.
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10, 135–146.
- Reisfeld, G. M., & Wilson, G. R. (2004). Use of metaphor in the discourse on cancer. *Journal of Clinical Oncology*, 22, 4024–4027.
- Robinson, M.D., & Fetterman, A. K. (2013). Toward a metaphor-enriched personality psychology. In M. Landau, M. Robinson, & B. Meier (Eds.), *The power of metaphor: Examining its influence on social life* (pp. 133–152). Washington, D. C.: APA Press.
- Rothschild, Z. K., Landau, M. J., Molina, L., Branscombe, N. R., & Sullivan, D. (2013). Displacing blame over the ingroup's harming of a disadvantaged group can fuel moral outrage at a third-party scapegoat. *Journal of Experimental Social Psychology*, 49, 898–906.
- Sheppard, K. (October 24, 2013). Al Gore: Keystone XL is 'ridiculous'. Retrieved from www.huffingtonpost.com
- Sontag, S. (1978). *Illness as metaphor*. New York: Farrar, Straus & Giroux.
- Thibodeau, P. H., & Boroditsky, L. (2011). Metaphors we think with: The role of metaphor in reasoning. *PLoS ONE*, 6(2), e16782.
- Thibodeau, P. H., & Durgin, F. H. (2011). Metaphor aptness and conventionality: A processing fluency account. *Metaphor and Symbol*, 26, 206–226.