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Metaphor Framing in Multiple Communication Modalities

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Abstract

Metaphors can shape how people reason about complex issues, but most studies of metaphor framing rely exclusively on written materials. This is a significant limitation, as people regularly encounter linguistic metaphors in a variety of different communicative settings (e.g., read in the newspaper, heard on the radio, or viewed on television). Because research finds that variations in communication modality can influence message comprehension, retention, and persuasiveness, we explored the relative power of metaphor framing in different communication modalities. Across two experiments, participants read, heard, or watched a person describe four different metaphorically framed issues. They had to answer a target question about each issue by selecting from two response options, one of which was congruent with the metaphor frame. Results revealed a significant, similarly-sized effect of metaphor framing in every communication modality, suggesting that communication modality does not moderate the efficacy of metaphor framing.

Keywords: Metaphor framing, reasoning, persuasion, communication modality

Introduction

For better or worse, the hangover is a universal feature of human life: drink too much and suffer the consequences. A *hangover* is also a popular metaphor for describing how people sometimes feel in the aftermath of engaging with significant sociopolitical events. For example, in the wake of the June 2016 UK referendum to withdraw from the European Union, many journalists described the public as suffering from a “Brexit Hangover” — characterized by feelings of remorse or regret (Logan, 2016), driven especially by renewed economic concerns (Dempsey, 2016; Porter, 2016; Roubini, 2016).

That so many pundits converged on the same basic, evocative metaphor underscores the key role that metaphor plays in communication, public discourse, and cognition (Flusberg, Matlock, & Thibodeau, 2018; Lakoff, 2008). Metaphors allow speakers to describe novel, complex, or abstract issues in terms of a relatively simple and more familiar domain, which helps to establish common ground and efficiently communicate a range of structured attitudes and beliefs. Over the past few decades, many scholars — most notably Lakoff and Johnson (1980) — have argued that metaphors should not be understood simply as auxiliary *linguistic* devices; rather, the pervasive, systematic patterns

of metaphor in everyday speech suggests that people *conceptualize* abstract subjects metaphorically.

In support of this view, experiments have shown that framing a discussion of an abstract or complex issue in terms of a particular metaphor can shape how people think and reason about it in a metaphor-congruent fashion (e.g. Elmore & Luna-Lucero, 2017; Flusberg, Matlock, & Thibodeau, 2017; Keefer et al., 2014; Sopory & Dillard, 2002; Thibodeau, 2016; Thibodeau & Boroditsky, 2011; Thibodeau, Crow, & Flusberg, 2016; Thibodeau & Flusberg, 2017; Thibodeau et al., 2017). To take three recent examples: (1) participants who read that depression is a state of being *down* are more likely to recommend a medication called “Liftix”, while those who read that depression comprises a *dark* period are more likely to suggest a medication called “Illuminex” (Kiefer et al., 2014); (2) if the federal budget is metaphorically compared to a household budget, people are more likely to say they would vote for a presidential candidate who had grown their own wealth (Thibodeau & Flusberg, 2017); and (3) when participants read that crime is a *beast* (as opposed to a *virus*) ravaging a city, they are more likely to recommend initiatives for addressing the crime problem that are enforcement-oriented, consistent with how people would resolve a literal beast problem (Thibodeau & Boroditsky, 2011).

This line of work also finds that the effects of metaphor framing are strongest (a) when the metaphor appears at the beginning of the stimulus vignette (as opposed to the end; Sopory & Dillard, 2002; Thibodeau & Boroditsky, 2011), (b) when the metaphor is extended in the phrasing of a conceptually congruent response option (Thibodeau, 2016), and (c) when the observer knows (and cares) about the source domain but does not have a strong prior commitment about how to address the target problem (Ottati, Rhoads, & Graessar, 1999; Thibodeau & Flusberg, 2017). These findings suggest that metaphor framing works in part by activating a conceptual schema associated with the source domain that guides how people build up a representation of, and then draw inferences about, the target domain (Thibodeau et al., 2017).

One critical limitation of the research on metaphorical framing is that it has relied almost exclusively on written materials; in each of the studies described above, participants had to read a brief paragraph that included the metaphorical frame before responding to a target question. This is notable because, in the real world, people encounter linguistic

metaphors in a variety of different communicative settings. In addition to reading metaphors printed in newspapers and in articles online (*written* format), we listen to people using them on the radio and in podcasts (*auditory* format), and we see and hear politicians and broadcasters using them in televised speeches and newscasts (*audiovisual* format). Are metaphors equally effective at shaping attitudes and beliefs in each of these different communication modalities?

Though this question has not been directly addressed in the literature, research has found that, in general, communication modality *does* influence how people process a message, which can have downstream consequences for comprehension, retention, and persuasion (Chaiken & Eagly, 1976; 1983; Furnham, & Gunter, 1989; Sparks et al., 1998). For example, likeable communicators are more persuasive in auditory and audiovisual modes of presentation, while unlikeable communicators are more persuasive in print (Chaiken & Eagly, 1983). This seems to result from the fact that communicator cues are more salient — and therefore play a larger role in attitude change — in recordings as compared to writing.

Some research has also found that people remember information better when it is presented in print than when it is presented in a recording (Furnham & Gunter, 1989; Furnham, Gunter, & Green, 1990). This may be because written information can be processed at the observer's own preferred pace and without the distraction of supplementary communicator cues. However, this picture is complicated by the observation that factors like age and message content moderate the effects of communication modality on memory. In one study, for instance, people recalled health warning messages equally well in written and auditory formats, though both of these conditions yielded better recall than an audiovisual one (Corston & Colman, 1997). Another study found that 11- and 13-year-old children remembered more content from a news story when it was presented on television than in print, though adults showed no such bias (Furnham, De Siena, & Gunter, 2002).

Taken together, this literature generates competing predictions about the ways in which communication modality might interact with metaphor framing. On the one hand, since printed messages often result in better comprehension and retention compared to recordings, metaphor framing might be most effective for written materials, allowing for deeper processing of the metaphor frame itself. On the other hand, printed messages do not always yield enhanced recall, especially for younger individuals, which adds uncertainty to the proposition that metaphors will always be processed more deeply in writing. Since metaphor framing can be thought of as a form of persuasive communication, it could actually be the case that a (relatively likeable) speaker will produce a larger metaphor framing effect in an auditory or audiovisual mode of presentation compared to print. Finally, communication modality might not moderate metaphor

framing effects much at all as long as participants are able to perceive and process the metaphor frame in context.

We directly addressed these divergent predictions across two experiments by exposing participants to a series of metaphorically framed messages either in a written, auditory, or audiovisual format. After each vignette, participants selected from two response options for addressing a target question about the issue, one of which was congruent with the initial metaphor frame. Results reveal the relative efficacy of metaphor framing in different communication modalities.

Experiment 1

Methods

Participants We recruited 610 participants (42% female) from Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011), using the TurkPrime platform (Litman, Robinson, & Abberbock, 2017). We aimed for a sample size of 200 individuals per condition to be consistent with past research on metaphor framing. All participants were at least 18 years of age ($M = 34.3$, $SD = 10.2$), lived in the US, and had a good performance record on previous tasks (minimum 85% approval rating).

Materials & Procedure The experiment was created using Qualtrics online survey software and consisted of four metaphor framing trials drawn from Thibodeau (2016), presented in a randomized order. Each trial consisted of a paragraph describing an issue framed using one of two metaphors. For example, in one vignette crime was framed as either a *virus plaguing* or a *beast preying on* a city. The three other vignettes described politics (as *theater* or *war*), research (as working on a *puzzle* or climbing a *mountain*), and sport (a billiards player was framed as an *assassin* or *detective*). Each of these vignettes elicited a reliable metaphor framing effect in prior work (Thibodeau, 2016; see Appendix for paragraphs and response options). The particular metaphor a given participant was exposed on each trial was randomly selected from the two possible options.

We used a between-subjects design, as participants were randomly assigned to one of three communication modality conditions: (1) a *Written* condition, where they read the vignettes on the screen, (2) an *Audiovisual* condition, where they watched and listened to videos of a relatively likeable¹, 30-something Caucasian male with glasses (the first author) read the vignettes, or (3) an *Auditory* condition, where they listened to the audio portion of these recordings but did not view the accompanying video. The videos were filmed using an Android smartphone and depicted the speaker from the shoulders up against a black backdrop wearing a blue button-down shirt and green corduroy blazer. Audiovisual stimuli can be viewed at <https://www.youtube.com/channel/UC9LubXADRIpAXAyUHfLGwPA>.

After reading, watching, or listening to each metaphorically framed vignette, participants were asked to

¹ Likeability was indexed by past student teaching evaluations as well as RateMyProfessor.com scores.

respond to a target question about the issue by selecting from one of two response options. Each response option was designed to be congruent with one of the two metaphor frames and included phrasing that extended the metaphor (see Thibodeau, 2016). For example, on the *Crime* trial, participants were asked, “Which of the following crime reducing options do you think would be more likely to reduce crime?” The response options included (1) “Treat the problem by reforming educational practices and creating after school programs” (congruent with the virus metaphor), and (2) “Attack the problem by increasing street patrols that look for criminals” (congruent with the beast metaphor). The response screen was presented in a written format for all participants.

After responding to all four metaphor framing trials, participants completed a basic demographics questionnaire and were thanked for their participation.

Results

We calculated the proportion of times each participant responded in a metaphor-congruent manner across the four framing trials. Because there were only two response options, the mean congruence score expected due to chance was 0.5.

Consistent with previous research, a single sample t-test comparing mean proportion metaphor-congruent responding to chance levels revealed a reliable, small-to-medium-sized effect of metaphor framing, as participants responded in a metaphor-congruent fashion 56.7% of the time overall, $t(609) = 6.63, p < 0.001, d = 0.27^2$. A one-way ANOVA revealed that this effect did not differ by condition, $F(2, 607) = .62, p = 0.54$. In other words, the magnitude of the metaphor framing effect did not significantly differ across communication modalities. See Figure 1.

Discussion

In Experiment 1, we asked whether metaphor framing effects differ across different communication modalities. Participants read, heard, or watched videos of a man describe four different issues, each of which was framed using one of two unique metaphors. After each vignette, participants had to answer a target question by selecting from between two response options, one of which was congruent with the metaphor frame they had been exposed to. Results revealed a reliable metaphor framing effect that was consistent with the results of previous studies (Thibodeau, 2016) but that did not differ across conditions. This suggests that communication modality does not significantly moderate the effect of metaphor framing, at least for some communicators.

One noteworthy methodological issue in this study is that the metaphor frames were extended into the phrasing of the response options (which were always presented in print on the screen). We chose to extend the metaphors in order to maximize the size of the metaphor framing effect (Thibodeau, 2016) and so we would have a greater chance of

observing differences across conditions. However, by presenting the extended metaphor in writing for all participants, we may have inadvertently obscured the very differences between the conditions that we had hoped to engender (since all participants read a printed metaphor in these responses). A related concern is that by extending the metaphor into the response options, the observed effects may have had more to do with lexical priming than metaphor processing (Thibodeau & Boroditsky, 2011). In other words, participants may have been drawn to a response option not because it was conceptually congruent with a metaphorical representation of the target issue, but because a keyword in the response (e.g. “treat”) was processed more fluidly due to lexical priming. Thus, the methodological decision to extend the metaphor frame into the phrasing of the response options represents a potential confound for interpreting our results.

In order to address this issue, we replicated this basic study in Experiment 2 using response options for the target questions that did not extend the metaphor frames (see Appendix and Thibodeau, 2016). The design and hypotheses for Experiment 2 were pre-registered on the Open Science Framework: osf.io/gb9mx.

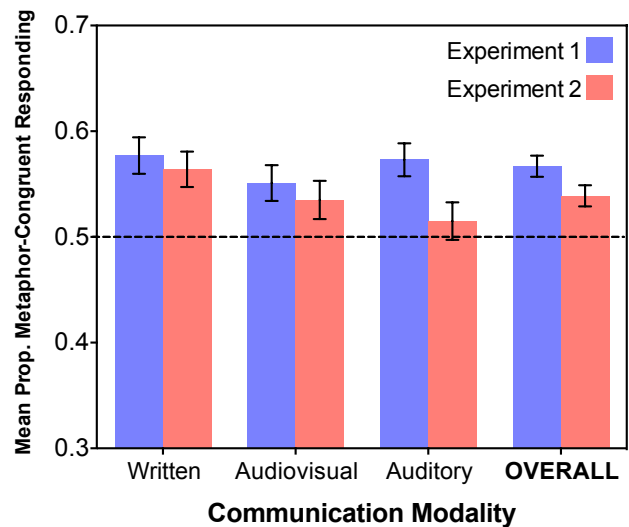


Figure 1. Mean proportion of metaphor congruent responses overall and by condition for Experiments 1 and 2. Dotted line represents chance level responding, while error bars represent standard errors.

Experiment 2

Methods

Participants We recruited 603 new participants (48% female) via mTurk. All participants were at least 18 years of age ($M = 35.3, SD = 11.1$), lived in the US, and had a good performance record on previous tasks (minimum 85% approval rating).

² We report the parametric statistical tests for clarity; non-parametric tests yield consistent results

Materials & Procedure Experiment 2 was identical to Experiment 1 with one critical exception: the phrasing of the response options on each trial did *not* extend the metaphor frames associated with the vignettes. For example, whereas in Experiment 1 the response options on the *Crime* trial read (1) “*Treat the problem by reforming educational practices and creating after school programs*” and (2) “*Attack the problem by increasing street patrols that look for criminals,*” in Experiment 2 the response options on this trial read (1) “*Reform educational practices and create after school programs*” and (2) “*Increase street patrols that look for criminals.*” Note that these response options are still conceptually congruent with each of the two metaphor frames (*virus* and *beast*, respectively), even though they no longer extend the metaphorical language (see Appendix and Thibodeau, 2016).

The only other change in Experiment 2 was that after participants completed the metaphor framing trials we probed their memory for the metaphors. We did this by presenting the first sentence of each vignette in a written format on the screen with a blank where the metaphorical phrasing would go (e.g. “*Crime is a [] the city of Addison*”). Participants had to type what they remembered about the sentence they had observed into a box below each prompt. Initial analyses of the memory data were inconclusive; in the interest of clarity and space we do not consider these data further.

Results

As in Experiment 1, we calculated the proportion of times each participant responded in a metaphor-congruent manner across the four framing trials. Because there were only two response options, the mean congruence score expected due to chance was again 0.5.

Consistent with what we observed in Experiment 1, a single sample t-test comparing mean metaphor-congruent responding to chance levels revealed a small but significant effect of metaphor framing, as participants responded in a metaphor-congruent fashion 53.9% of the time overall, $t(602) = 3.81, p < 0.001, d = 0.16$. A one-way ANOVA revealed that this effect did not differ by condition, $F(2, 600) = 2.05, p = 0.13$. In other words, as in Experiment 1, the magnitude of the metaphor framing effect did not significantly differ across communication modalities. See Figure 1.

Combined Analysis. We also ran a 2 (Experiment: 1 vs. 2) X 3 (Communication Modality: Written vs. Audiovisual vs. Auditory) factorial ANOVA with proportion metaphor-congruent responding as the dependent variable. This analysis replicated the results of Thibodeau (2016), showing that participants were more likely to be influenced by the metaphor frame when the metaphor was extended into the language of the response options. That is, there was a significant main effect of Experiment, as participants had a higher proportion of metaphor-congruent responding in Experiment 1 compared to Experiment 2, $F(1, 1207) = 4.01, p = 0.045$. Neither the main effect of Condition, nor the interaction between Experiment and Condition were statistically significant, suggesting that the overall pattern of

responding in the two experiments was similar across communication modalities (F 's $< 1.65, p$'s > 0.19).

Item Analysis. Finally, we used a series of mixed-effect logistic regression models to test for differences by item (Jaeger, 2008). Of note, this approach also confirmed the main effect of Experiment, $\chi^2(1) = 3.96, p = .047$: participants were more likely to give a congruent response in Experiment 1 than in Experiment 2; this approach also confirmed that responses did not differ by modality, $\chi^2(2) = 3.23, p = .199$; nor was there an interaction between Experiment and modality in the logistic regression model, $\chi^2(2) = 2.04, p = .361$.

Including a predictor for domain (sport, crime, politics, research) yielded a significant main effect, $\chi^2(3) = 29.72, p < .001$. As shown in Figure 2, participants were less likely to respond to the crime story with a metaphor-congruent suggestion compared to the other issues. This may be due to the fact that the crime vignette was slightly longer and instantiated the metaphor frame less frequently than the other paragraphs. That said, one goal of future work will be to explore potential reasons for the variability across domains/metaphors. The model did not reveal interactions between item, Experiment, and communication modality, $\chi^2(15) = 18.38, p = .243$.

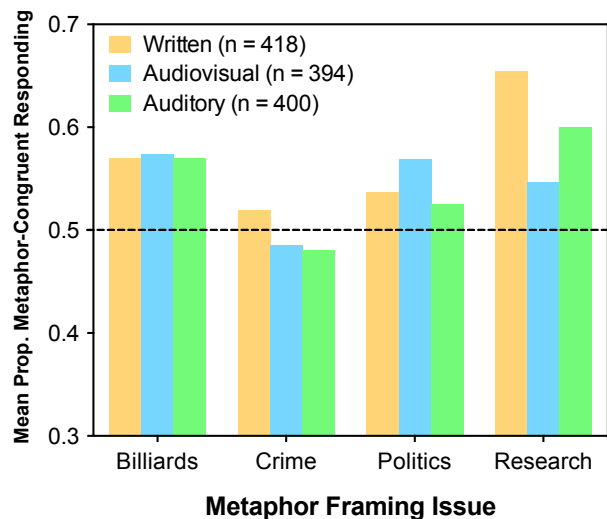


Figure 2. Mean proportion of metaphor congruent responses by metaphor framing issue for each communication modality condition, collapsed across Experiments 1 and 2. Dotted line represents chance level responding.

Discussion

The results of Experiment 2 replicated what we observed in Experiment 1, as we found a reliable metaphor framing effect that did not significantly differ across communication modalities. Since the response options in Experiment 2 did not extend the metaphor frames we used in the vignettes, this particular methodological concern cannot account for the results of our two studies. This provides stronger evidence that the efficacy of metaphor framing does not much differ across communication modalities.

We also replicated the results of Thibodeau (2016), who showed that metaphor framing effects are stronger when the metaphor frame is extended into the language of the response options. In this case, the proportion of metaphor-congruent responding was significantly higher in Experiment 1 (56.7%), where the metaphors were extended, than in Experiment 2 (53.9%), where they were not.

General Discussion

When a journalist describes the aftermath of the Brexit decision as a public *hangover*, it calls to mind a world where many people have negative, remorseful feelings towards the *leave* decision. Research on metaphor processing suggests that people who read an article that frames the issue in this way would be automatically inclined to draw inferences based on this construal, affecting everything from their own attitudes towards Brexit to their desire for another referendum (Flusberg et al., 2018; Thibodeau et al., 2017).

One significant limitation in the experimental literature on metaphor framing is the fact that these studies have relied almost exclusively on written materials. This is notable, as people regularly encounter metaphors in a variety of different communication modalities, which has been shown to affect message processing and persuasiveness (e.g., Chaiken & Eagly, 1976; 1983; Furnham, & Gunter, 1989; Sparks et al., 1998). In the present study, we addressed this issue by implementing a basic metaphor framing task in different communication formats.

Across two experiments, participants read, heard, or watched a person describe four different issues framed with one of two unique metaphors. After each vignette, they had to select from two response options to address a target question, one of which was congruent with the metaphor frame they had observed. Results revealed a significant, similarly-sized effect of metaphor framing in all conditions, suggesting that communication modality does not moderate the efficacy of metaphor framing. This was true whether the metaphor frame was extended in the language of the response options (Experiment 1), or not (Experiment 2), suggesting that neither lexical priming nor reading metaphorical language is sufficient to explain our results. However, we did replicate the finding that extending the metaphor leads to enhanced metaphor framing overall (Thibodeau 2016).

The current studies also suggest several avenues for future research. For example, metaphors may be more persuasive in an auditory or audiovisual format when spoken by a more likable person, or by a person with higher social status. In future work, we plan to manipulate features of the communicators to explore such possibilities. We also hope to explore why some metaphors and domains are more likely to elicit metaphor framing effects than others. And we are interested in testing whether certain people are more likely to be influenced by metaphors than others.

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Appendix: Experimental Stimuli

Crime. Crime is a {*virus plaguing / beast preying on*} the city of Addison. Five years ago Addison was in good shape, with no obvious vulnerabilities. Unfortunately, in the past five years the city's defense systems have weakened, and the city has succumbed to crime. Today, there are more than 55,000 criminal incidents a year—up by more than 10,000 per year. There is a worry that if the city does not regain its strength soon, even more serious problems may start to develop. The city's officials know that they have to change certain policies in response to the problem, but they aren't sure which policies to change or how much to change them. *Which of the following crime reducing options do you think would be more likely to reduce crime?*

Experiment 1 Response Options

1. Treat the problem by reforming educational practices and creating after school programs (*congruent with virus*)
2. Attack the problem by increasing street patrols that look for criminals (*congruent with beast*)

Experiment 2 Response Options

1. Reform educational practices and create after school programs (*congruent with virus*)

2. Increase street patrols that look for criminals (*congruent with beast*)

Politics. The Democrats and Republicans have been {*playing political theater / fighting a battle*} with each other in which both parties seem more interested in {*performing dramatic monologues / attacking their opponent*} than engaging with difficult policy questions. Congress has passed roughly 80% fewer bills in recent terms than it did in the '70s and '80s. *Which of the following do you think would be more likely to change the culture in Washington?*

Experiment 1 Response Options

1. Close the curtain on the saga by ending the 24-hour media coverage of politicians (*congruent with theater*)
2. Bring a truce to the war by forcing politicians to acknowledge their common obligation (*congruent with battle*)

Experiment 2 Response Options

1. End the 24-hour media coverage of politicians (*congruent with theater*)
2. Force politicians to acknowledge their common obligations (*congruent with battle*)

Research. Dr. Roy is a cancer researcher. When she does her work, she imagines herself {*working on a puzzle—pondering how to make the pieces fit together / scaling a mountain—slowly but surely planting one foot in front of the other*}. She seeks to make a positive impact on the scientific community—to extend our understanding of the disease and methods for treatment. *Which of the following would you predict of the researcher?*

Experiment 1 Response Options

1. Looks for connections by testing completely novel theories (*congruent with puzzle*)
2. Gains ground by using methods that are simple to follow (*congruent with mountain*)

Experiment 2 Response Options

1. Tests completely novel theories (*congruent with puzzle*)
2. Uses methods that are simple to follow (*congruent with mountain*)

Sport. Aaron is the {*detective / sniper*} of the billiards world. He feels like he can {*be a sleuth uncovering clues to unlock a game / eye the table like an assassin targeting a line of shots*}. He can often sink several balls in a row, winning before their opponent has any real chance to take a shot of their own. *What do you think the player is more likely to focus on when he's playing?*

Experiment 1 Response Options

1. Deciphering a sequence of several shots (*congruent with detective*)
2. Locking the current shot in his crosshairs (*congruent with sniper*)

Experiment 2 Response Options

1. Setting up a sequence of several shots (*congruent with detective*)
2. Making the current shot (*congruent with sniper*)