

Proposal: Linguistic Framing as Pragmatic Reasoning

Abstract:

People are more likely to purchase meat described as “75% lean” rather than “25% fat,” to support a carbon-reduction program described as an “offset” rather than a “tax,” and to recommend street patrols when crime is described as a “beast” rather than a “virus.” Such *framing effects*—effects of specific words and grammatical structures on people's attitudes and judgments—are well-documented across a variety of decision-making contexts. However, these effects have been studied largely in isolation, and there is no unified account of the cognitive mechanisms driving them. Several recent studies point to a common mechanism: *pragmatic reasoning ability*, or the ability to recognize the implicit information communicated by speakers through their choice of language. On this account, speakers choose specific frames because they communicate well-informed beliefs, and listeners infer those beliefs from a speaker's chosen frame. For example, the syntactic structure of the statement “girls are as good as boys at math” implies that the speaker believes boys are superior, and framing effects elicited by this statement have been shown to be driven by listeners' ability to infer the speaker's belief. Given evidence that pragmatic reasoning is involved in several different types of framing effects, we propose to explore the pragmatic reasoning account of linguistic framing on a large scale by conducting two studies. In Study 1, we will validate a pragmatic reasoning measure newly developed in our lab by examining correlations between its subscales (corresponding to different types of framing), and between our measure and several similar but distinct cognitive constructs (e.g., reflective thinking, social sensitivity). In Study 2, we will examine the extent to which pragmatic reasoning for different types of framing predicts a range of previously documented framing effects. We expect that pragmatic reasoning ability for a given type of framing (e.g., syntactic: “girls are as good as boys”) will strongly predict its corresponding framing effect (e.g., the likelihood of choosing boys as superior). However, we also predict that pragmatic reasoning ability for a given type of framing will predict other types of framing effects (e.g., equivalence: “75% lean” vs. “25% fat”). These studies have the potential to inform a unified account of linguistic framing, with significant implications for our understanding of how people process information biased by framing in the media and in everyday discourse.

Background and Rationale:

People report more concern about climate change when it is described as a “war” rather than a “race” (Flusberg et al., 2017), show more prejudice toward migrants when they are labeled “illegal aliens” rather than “noncitizens” (Rucker et al., 2019), and blame people more for accidents when the description uses transitive rather than intransitive verb forms (Fausey & Boroditsky, 2010). These are just a few of the many varieties of *framing effects*—effects of specific words and grammatical structures on attitudes, judgments, and decisions, often with real-world consequences. Such effects are widely documented and have significant implications for how people think and communicate about important sociopolitical issues.

The aspects of language that give rise to framing effects, and the thoughts and behaviors they implicate, are remarkably diverse. Perhaps given this heterogeneity, research on the cognitive mechanisms underlying framing effects has tended to focus on singular causes for specific effects. For example, the preference for one outcome (e.g., 1/3 of lives being “saved”) over another logically equivalent outcome (e.g., 2/3 of people “dying”) has been attributed to the different emotional responses elicited by the two linguistic frames (Nabi et al., 2020). Similarly, the framing effects of metaphors on reasoning about complex issues (e.g., greater support for street patrols when crime is framed as a “beast” rather than a “virus”) have been explained as a cognitive process of structural alignment between the two concepts joined by the metaphor (Thibodeau et al., 2017).

Despite the apparent diversity of framing effects and the proposed explanations for them, different types of framing may be united by a common mechanism: the ability to recognize the subtle implications of linguistic expressions. Pragmatic accounts of language hold that specific words and phrases are chosen by their speakers to communicate relevant, truthful information (Goodman & Frank, 2016; Grice, 1975). In the case of framing, speakers may choose one frame over another, consciously or otherwise, because it reflects their knowledge or beliefs about the framed information (McKenzie & Nelson, 2003). In the examples mentioned above, a medicine may be described as causing 1/3 of people to be “saved” (rather than 2/3 “dying”) because the speaker believes the medicine is effective, and a city's crime problem may be likened to a “beast” (rather than a “virus”) because the speaker knows that the problem requires aggressive law enforcement strategies (Thibodeau & Boroditsky, 2011).

More direct evidence for the role of pragmatic reasoning in framing effects comes from recent work showing that language comprehenders readily infer the beliefs and recommendations implied by a speaker’s choice of frame. In a series of studies by Holmes (the sponsoring faculty member) and several Reed College and Colorado College undergraduates, participants who read that “girls were just as good as boys at math” inferred from the syntactic structure of the statement that the writer believed boys (the implied reference point) to be the more skilled gender (Doherty et al., 2020; Wu et al., 2021). Pragmatic reasoning is also implicated in Holmes and colleagues’ recent studies of *victim framing*—the act of describing the alleged perpetrator of a crime as the “real” victim, as often occurs in media reports of sexual assault. Perhaps troublingly, such framing has been shown to boost support for the individual described as a victim, and these effects are driven by participants who cite the word “victim” as influential in their evaluations (Davis et al., 2021; Flusberg et al., in revision; Holmes et al., 2019; Yin et al., 2021). These findings suggest that people interpret the victim label pragmatically, as a signal from the writer that the victim-framed individual is deserving of support and clemency.

Taken together, these studies point to pragmatic reasoning as a potential mechanism driving seemingly disparate framing effects. The proposed project is a large-scale exploration of this possibility. Holmes and colleagues have recently developed a novel measure of pragmatic reasoning that assesses the ability to infer a writer’s beliefs from a chosen frame and to infer which frame will be chosen given a writer’s beliefs. Preliminary evidence suggests that individuals differ widely in their pragmatic reasoning abilities. In the proposed project, we will examine whether such abilities predict the magnitude of a wide range of well-documented framing effects traditionally studied in isolation, including effects of equivalence framing (e.g., 1/3 “saved” vs. 2/3 “died”), emphasis framing (government funding as a “bailout” vs. a “rescue”), social identity framing (e.g., migrants as “illegal aliens” vs. “noncitizens”), metaphor framing (e.g., crime as a “beast” vs. “virus”), and syntactic framing (e.g., “girls are as good as boys” vs. “boys are as good as girls”). Finding that pragmatic reasoning ability predicts all or a subset of these different framing effects would lay the foundation for a unified, mechanistic account of linguistic framing. Such an account would have significant real-world implications for how people think and communicate. Moreover, our findings may illuminate why some people are more susceptible than others to persuasive rhetoric in the media and in everyday discourse.

Specific Aim and Hypotheses:

We will conduct two studies to investigate pragmatic reasoning ability as a common mechanism driving different types of linguistic framing effects. First, we will validate a novel measure of pragmatic reasoning ability by confirming that (a) the ability to infer a writer’s beliefs from a chosen frame and (b) the ability to infer which frame will be chosen given a writer’s beliefs are related across several different linguistic structures and expressions (H_1). Second, we will assess whether performance on this pragmatic reasoning measure predicts the magnitude of several well-documented framing effects (equivalence, emphasis, social identity,

metaphor, and syntactic). We expect that pragmatic reasoning ability for a specific linguistic structure or expression will be a strong predictor of framing effects for that structure or expression, but will also predict other seemingly disparate framing effects (H_2). For example, we expect that participants' ability to infer a speaker's beliefs from the way they label a certain social group (e.g., "noncitizens" vs. "illegal aliens") will strongly predict whether participants' judgments align with the label (e.g., more support for punitive immigration policies when migrants are described as "illegal aliens" than as "noncitizens"). We also expect that this ability will predict other framing effects, such as favoring a medical procedure described as having a 75% success rate over a procedure with a 25% failure rate.

Design and Procedure:

Study 1: Adult U.S. residents will be recruited via CloudResearch ($N = 240$), an online platform used to recruit participants from Amazon's Mechanical Turk crowdsourcing site (www.mturk.com). Participants will complete a measure of pragmatic reasoning, where they will infer a speaker's beliefs about a subject from how the speaker frames the subject, or infer the frame the speaker will choose based on their stated beliefs about the subject. For example, participants could read that a political leader announcing a decision to make their city a sanctuary city holds favorable views of migrants who have not completed the official visa process. They would then be asked which of two statements they thought the leader was more likely to use (e.g., "Johnson Ridge will start implementing plans immediately to become a sanctuary city for *undocumented immigrants/illegal aliens*."). Participants will also complete a demographic measure, along with measures of their social intelligence, inclination toward effortful thinking, autistic traits, tendency to engage in reflection, personality traits, and tendency to give socially desirable answers on survey measures. These measures will serve as covariates, and are expected to correlate weakly with the measure of pragmatic reasoning. Small but significant correlations between pragmatic reasoning and the covariates would validate our measure of pragmatic reasoning by showing that it taps a similar but distinct cognitive construct, rather than those captured by the covariate measures. Covariates will be presented sequentially in random order, and the order of the pragmatic reasoning measure and the covariates will be counterbalanced across participants. Pragmatic reasoning items will be grouped by their type of framing (e.g., equivalence, social identity, etc.) and presented in random order, with the order of inferring-frame questions and inferring-belief questions counterbalanced for each framing type.

Study 2: A new sample of adult U.S. residents will be recruited via CloudResearch ($N = 400$). They will complete a framing task; for each type of framing, participants will read a passage that uses one of two potential frames (e.g., describing a city's crime problem as a "beast" or a "virus"), then report their attitudes regarding the topic of the passage (e.g., the extent to which they would support increased street patrols). The order in which items are presented within the framing measure will be randomized. Participants will also complete the measure of pragmatic reasoning used in Study 1. Framing and pragmatic reasoning measures will be counterbalanced across participants. Lastly, participants will complete the same covariate measures used in Study 1. We will conduct multiple regression analyses controlling for the covariates to test whether pragmatic reasoning ability uniquely predicts framing effects over and above other factors.

Predicted Outcomes and Alternative Outcomes:

H_1 : We expect that pragmatic reasoning ability across different types of framing will be positively correlated, such that better pragmatic reasoning ability for one type of framing will be associated with better ability for other types of framing. Alternatively, pragmatic reasoning abilities for different types of framing may not be correlated, suggesting that these different

framing types are driven by distinct cognitive processes. Such findings would dovetail with previous research that proposed different explanations for different framing effects.

H₂: We expect that pragmatic reasoning ability will predict framing effects. Specifically, pragmatic reasoning ability for one type of frame will strongly predict framing effects for that type of frame, and will predict framing effects for other types of frames to a lesser extent. We expect that participants with better pragmatic reasoning abilities will show stronger framing effects because they will be more likely to identify the implications of the framing language and make judgments accordingly. However, it is also possible for better pragmatic reasoning ability to instead be associated with weaker framing effects. In this case, participants who are better at pragmatic reasoning may recognize the implications of the framing language and correct for the "bias" of the frame. A third possibility is that pragmatic reasoning ability may not predict framing effects. If framing effects are independent of participants' pragmatic reasoning ability, our findings would suggest that pragmatic reasoning plays a more limited or context-dependent role in framing effects, rather than serving as a mechanism driving them.

Role of the Student:

The student (they/he) will be immersed in all aspects of the research process, including idea generation, study design, stimulus creation, data collection and analysis, and co-writing for conference submission and eventual journal publication. They will participate in weekly lab meetings where they will give status updates on the project, present preliminary findings, and discuss relevant research articles with Kevin, Nan Elpers (our post-bac lab manager), and three other Reed students. The student will also gain exposure to the scientific peer-review process by co-reviewing journal manuscripts with Kevin.

Role of the Faculty Member:

Kevin (he/him) will meet daily with the student throughout the summer to discuss research progress and plan next steps. He will scaffold the student's development as a scientist by engaging them in the theory and methods that fuel current research on linguistic framing and other topics in cognitive science. He will model the analytic approach and practices of a working scientist, provide detailed feedback on the student's work, facilitate weekly lab meetings, and encourage the student and the other students in the lab to support and challenge each other.

Benefit to the Student:

Through carrying out the proposed project, the student will learn to work both independently and as part of a lab team, practice critical thinking, hone technical and statistical skills (e.g., Qualtrics, MTurk, JASP), gain experience with open science practices (e.g., preregistration of methods and analysis plans), and build confidence as a researcher. The student will also build connections with researchers at other institutions, as collaborators Stephen Flusberg (SUNY Purchase College) and Paul Thibodeau (Oberlin College) will join lab meetings via Zoom. Finally, the student will have the opportunity to engage with the broader scientific community by attending the 2021 Cognitive Science Society virtual conference (July 26-29, 2021), where several lab members will be presenting their work. The 2022 iteration of this conference is one of the target outlets for the proposed project.

References:

- Davis, L., Flusberg, S. J., & Holmes, K. J. (2021, May). How victim framing shapes attitudes towards police violence. Poster to be presented at the 2021 APS Virtual Convention.
- Doherty, E. M., Flusberg, S. J., & Holmes, K. J. (2020). "Girls are as good as boys" implies boys are better, but only in the absence of explicit awareness. In S. Denison, M. Mack, Y. Xu, & B. C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp. 1591-1597).
- Fausey, C. M., & Boroditsky, L. (2010). Subtle linguistic cues influence perceived blame and financial liability. *Psychonomic Bulletin & Review*, *17*(5), 644-650.
- Flusberg, S. J., Matlock, T., & Thibodeau, P. H. (2017). Metaphors for the war (or race) against climate change. *Environmental Communication*, *11*(6), 769-783.
- Flusberg, S. J., van der Vord, J., Husney, S. Q., & Holmes, K. J. (in revision). Who's the "real" victim? How victim framing shapes attitudes towards sexual assault.
- Goodman, N. D., & Frank, M. C. (2016). Pragmatic language interpretation as probabilistic inference. *Trends in Cognitive Sciences*, *20*(11), 818-829.
- Grice, H. P. (1975). Logic and conversation. In *Speech acts* (pp. 41-58). Brill.
- Hardisty, D. J., Johnson, E. J., & Weber, E. U. (2010). A dirty word or a dirty world? Attribute framing, political affiliation, and query theory. *Psychological Science*, *21*(1), 86-92.
- Holmes, K. J., Husney, S. Q., Pollard, C., & Flusberg, S. J. (2019, May). Victim framing shapes attitudes towards sexual assault. Poster presented at the 31st Annual Convention of the Association for Psychological Science, Washington, DC.
- Levin, I. P., & Gaeth, G. J. (1988). How consumers are affected by the framing of attribute information before and after consuming the product. *Journal of Consumer Research*, *15*(3), 374-378.
- McKenzie, C. R., & Nelson, J. D. (2003). What a speaker's choice of frame reveals: Reference points, frame selection, and framing effects. *Psychonomic Bulletin & Review*, *10*(3), 596-602.
- Nabi, R. L., Walter, N., Oshidary, N., Endacott, C. G., Love-Nichols, J., Lew, Z. J., & Aune, A. (2020). Can emotions capture the elusive gain-loss framing effect? A meta-analysis. *Communication Research*, *47*(8), 1107-1130.
- Rucker, J. M., Murphy, M. C., & Quintanilla, V. D. (2019). The immigrant labeling effect: The role of immigrant group labels in prejudice against noncitizens. *Group Processes & Intergroup Relations*, *22*(8), 1139-1160.
- Thibodeau, P. H., & Boroditsky, L. (2011). Metaphors we think with: The role of metaphor in reasoning. *PloS One*, *6*(2), e16782.
- Thibodeau, P. H., Hendricks, R. K., & Boroditsky, L. (2017). How linguistic metaphor scaffolds reasoning. *Trends in Cognitive Sciences*, *21*(11), 852-863.
- Wu, S., Elpers, N., Doherty, E. M., Flusberg, S. J., & Holmes, K. J. (2021, July). Pragmatic reasoning ability predicts syntactic framing effects on social judgments. Poster to be presented at the 43rd Annual Conference of the Cognitive Science Society, Vienna, Austria and online.
- Yin, B., Flusberg, S. J., & Holmes, K. J. (2021, May). "I'm the real victim": Self-victim framing and perceptions of sexual assault. Poster to be presented at the 2021 APS Virtual Convention.

Budget:**Total requested: \$1,500**

Study 1: Validating our novel measure of pragmatic reasoning ability

¹ $N = 240$ participants on Amazon Mechanical Turk (MTurk; www.mturk.com) who currently reside in the U.S.

Study duration: 15 minutes

²Participant remuneration: \$1.50/participant = \$360

Amazon Mechanical Turk commission (20%) = \$72

³CloudResearch fee (10%) = \$36

Study 2: Does pragmatic reasoning ability predict different types of framing effects?

¹ $N = 400$ participants on MTurk who currently reside in the U.S.

Study duration: 20 minutes

²Participant remuneration: \$2/participant = \$800

Amazon Mechanical Turk commission (20%) = \$160

³CloudResearch fee (10%) = \$80

Notes:

1. These sample sizes reflect current standards in cognitive science. They will provide sufficient statistical power to detect the predicted effects and will enable precise effect size estimates.
2. These remuneration rates are at or slightly above the “market rate” on MTurk and were selected to ensure that participants are compensated fairly for their time and effort.
3. CloudResearch (www.cloudresearch.com) is a participant-sourcing platform used by many labs (including Holmes’) to implement inclusion criteria (e.g., recruiting only participants who have not completed previous related studies) and to ensure MTurk data quality.