

# The Psychology of Framing: How Everyday Language Shapes the Way We Think, Feel, and Act

Psychological Science in the  
Public Interest  
2024, Vol. 25(3) 105–161  
© The Author(s) 2024  
Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/15291006241246966  
www.psychologicalscience.org/PSPI



Stephen J. Flusberg<sup>1</sup>, Kevin J. Holmes<sup>2</sup>, Paul H. Thibodeau<sup>3</sup>,  
Robin L. Nabi<sup>4</sup>, and Teenie Matlock<sup>5</sup>

<sup>1</sup>Department of Cognitive Science, Vassar College; <sup>2</sup>Department of Psychology, Reed College;

<sup>3</sup>Independent Scholar; <sup>4</sup>Department of Communication, University of California, Santa Barbara;

and <sup>5</sup>Department of Cognitive Science, University of California, Merced

## Abstract

When we use language to communicate, we must choose what to say, what not to say, and how to say it. That is, we must decide how to *frame* the message. These linguistic choices matter: Framing a discussion one way or another can influence how people think, feel, and act in many important domains, including politics, health, business, journalism, law, and even conversations with loved ones. The ubiquity of *framing effects* raises several important questions relevant to the public interest: What makes certain messages so potent and others so ineffectual? Do framing effects pose a threat to our autonomy, or are they a rational response to variation in linguistic content? Can we learn to use language more effectively to promote policy reforms or other causes we believe in, or is this an overly idealistic goal? In this article, we address these questions by providing an integrative review of the psychology of framing. We begin with a brief history of the concept of framing and a survey of common framing effects. We then outline the cognitive, social-pragmatic, and emotional mechanisms underlying such effects. This discussion centers on the view that framing is a natural—and unavoidable—feature of human communication. From this perspective, framing effects reflect a sensible response to messages that communicate different information. In the second half of the article, we provide a taxonomy of linguistic framing techniques, describing various ways that the structure or content of a message can be altered to shape people's mental models of what is being described. Some framing manipulations are subtle, involving a slight shift in grammar or wording. Others are more overt, involving wholesale changes to a message. Finally, we consider factors that moderate the impact of framing, gaps in the current empirical literature, and opportunities for future research. We conclude by offering general recommendations for effective framing and reflecting on the place of framing in society. Linguistic framing is powerful, but its effects are not inevitable—we can always reframe an issue to ourselves or other people.

## Keywords

framing, framing effects, communication, language, reasoning, attitudes, affect, pragmatics, metaphor, decision-making, risky choice

Language is used for doing things. (Clark, 1996, p. 3)

We are captivated by stories about the arcane power of language. Saying just the right words at just the right moment can help you find hidden treasures, mesmerize your enemies, defeat true evil, and unlock the mysteries of time. One popular trope involves using language to manipulate and control people. Consider George Orwell's dystopian classic *1984*. The totalitarian

government of Oceania created a simplified form of English—"Newspeak"—to keep the population in check. By whittling down the meaning of words such as "freedom," this language suppresses the inclination to entertain subversive thoughts, reducing a person's will to resist. Other fictional worlds depict a vast array

## Corresponding Author:

Stephen J. Flusberg, Department of Cognitive Science, Vassar College  
Email: sflusberg@vassar.edu

of coercive linguistic techniques, from magical spells (“*Imperio!* yelled Voldemort”) to hypnotic brainwashing (“You are getting very sleepy . . .”). A recent example comes from the 2013 sci-fi novel *Lexicon* by Max Barry. The story follows a shadowy organization whose members, known as “Poets,” are masters of verbal persuasion. New recruits, screened for their intuitive charisma, learn a secret, ancient vocabulary that lets them control other people’s minds and manipulate their memories, thoughts, and behavior.

It is tempting to dismiss these stories as mere fantasy, but speculative fiction often mirrors real cultural anxieties. The focus on linguistic control in popular media may reflect a deeper concern—and fascination—with the force of language in our daily lives. We routinely use words to try to influence what other people are thinking, feeling, and doing. You may attempt to convince a hesitant friend to attend a party (“You only live once!”) or persuade your spouse to forgive you for spending your savings on an unusable plot of land (“It’s an investment!”). Cable news pundits work to drum up support for their preferred politicians (“She’s a true patriot!”) and vilify their ideological opponents (“He’s a fascist!”). Think tanks, advertising companies, media corporations, and political campaigns spend billions each year to generate the perfect slogan, catchphrase, or headline to drive votes, clicks, and sales. And then there are the influencers, self-help gurus, and grifters whose livelihoods depend on robust verbal influence.

Amidst this endless barrage of linguistic messaging, it makes sense that we would be drawn to fantastical stories about the manipulative powers of language. The stakes are high, with financial and political fortunes on the line. And there is something enticing about the prospect of honing our own powers of verbal persuasion. Being more persuasive will surely solve our problems, right? If we learn to say the right things at the right times, won’t we achieve greater success in work and love? There is clearly a market for this belief. Bookshelves are lined with promises to unlock the secrets of linguistic influence, including titles such as *Words That Work: It’s Not What You Say, It’s What People Hear* by pollster Frank Luntz (2007) and *Magic Words: What to Say to Get Your Way* by marketing professor Jonah Berger (2023).

But are we really so easy to manipulate, like the denizens of Orwell’s Oceania, unconsciously pushed this way and that by the words and phrases we encounter in everyday life? Or are we somehow immune to the effects of language? Why are some messages so captivating or insidious and others so mundane or benign? Can we learn to use language more effectively to promote causes we believe in and achieve outcomes we seek, or is this overly idealistic? For decades,

researchers have sought answers to these questions, which bear on a broad set of issues in the public interest—the impact of partisan media and political rhetoric, the efficacy of environmental and health communication, and support for systemic policy reforms, among many others. Our goal in this article is to synthesize this literature, much of which is rooted in the core construct of *framing*.

When we use language to communicate with others, we must choose what to say, what not to say, and how we want to say it. That is, we must decide how to *frame* the message. Framing is an intrinsic feature of linguistic communication because every message must take one particular form and not another, and the same event or issue can always be described in many different ways. We can emphasize the positives or negatives (or both), the risks or sure bets (or both); we can use loaded or neutral language, concrete metaphors or abstract descriptions, active or passive voice; and we can communicate our own perspective and preferences, obscure our group identity, or tailor our message for each audience. These linguistic choices matter: Framing a discussion one way or another can influence how people think, feel, and act in many important domains, including politics, health, business, journalism, law, and even everyday conversations with loved ones. As a result, research on framing spans a wide range of fields, including sociology and anthropology (Bateson, 1972/1987; Goffman, 1974), economics and political science (Chong & Druckman, 2007; de Bruijn, 2019; Farrow et al., 2018), linguistics (Lakoff, 2010; Matlock, 2012), media studies and communication (Iyengar, 1991; Lecheler & de Vreese 2019; Nabi, 2003), and psychology and neuroscience (De Martino et al., 2006; Flusberg et al., 2022; Tversky & Kahneman, 1981). The multidisciplinary study of *framing effects* examines when, how, and why different forms of language—including differences in word choice, grammar, concreteness, and emphasis—affect how people respond to a message.

Sometimes framing involves glaring contrasts in message content. This is apparent to anyone attuned to the ongoing culture war in the United States. The escalating conflict between “blue” and “red” America is unfolding as a series of linguistic battles in all forms of public discourse. Were the events of January 6, 2021, a *violent insurrection* or *legitimate political discourse*? Is legal access to abortion about the *right to bodily autonomy* and *reproductive health care* or about the *state-sponsored murder of unborn children*? Do companies have an *obligation to serve everyone equally*, or do they maintain the *freedom* to reject same-sex couples and other customers on the basis of *religious liberty*? The two sides have framed each issue differently to promote a

particular set of values and way of thinking and to shape public sentiment and voter turnout. Such heavy-handed rhetoric may seem cynical and manipulative, but framing can also be useful and productive, helping us approach an issue from different perspectives and improve our reasoning (Bermúdez, 2020).

At other times, framing is more inconspicuous. For example, you may not have noticed that we used the language of war to describe both our modern predicament (“*endless barrage* of linguistic messaging . . .”) and the divide between American liberals and conservatives (“The *escalating conflict* . . . a series of linguistic *battles*”). Among other psychological effects, war metaphors have been shown to heighten the sense of urgency surrounding an issue (Flusberg et al., 2017, 2018). Would it make any meaningful difference if we used a different metaphor to describe political polarization? For instance, we could say that Republicans and Democrats are “playing political theater” and “performing dramatic monologues” in the media, but would this matter? We return to this issue later in the “Figurative Framing” section, in which we take a closer look at the nature, impact, and limits of metaphor framing.

But first we need to lay some foundations. We begin with a brief history of research on frames and framing. Interest in these ideas developed independently in different academic disciplines during the 20th century (K. Sullivan, 2023; Tannen, 1993). Consequently, terms such as “frame” carry several different, albeit interrelated, connotations. Unpacking this history is helpful for situating contemporary research on framing. We then discuss research on specific framing effects, examining how language can influence attention and perception, beliefs, attitudes, memory, judgment and decision-making, and real-world behavior. From there, we explore where these effects come from, beginning with a primer on the psychology of language comprehension: How do we make sense of what we hear and read? This discussion illuminates the cognitive, social-pragmatic, and emotional mechanisms underlying many linguistic framing effects and shows that framing is a natural—and unavoidable—feature of human communication. From this perspective, framing effects reflect a sensible response to messages that communicate different information.

With these pieces in place, we then provide a taxonomy of linguistic framing techniques, which we organize around the elements of language manipulated in messages. These techniques include various labels, metaphors, and grammatical forms. We go on to describe some factors that moderate the impact of framing, along with gaps in our current understanding that would benefit from additional research. We conclude with advice on how to frame messages effectively and

consider what all of this means for navigating our language-rich social environments. Throughout the article, we emphasize the relevance of framing to the public interest, highlighting issues such as environmental and health communication, political rhetoric, and policy-making. If we have framed this article effectively, your curiosity should be piqued and you’ll want to read on. Go right ahead!

## What’s in a Frame? A Brief History

For millennia, humans have been using language to influence others’ attitudes, decisions, and actions. Persuasive communication, or *rhetoric*, has been a topic of interest since classical antiquity. Aristotle famously argued that effective rhetoric rests on three pillars: *logos* (appeals to logic and reason), *pathos* (appeals to emotions), and *ethos* (appeals to the authority or status of the speaker; Rapp, 2022). Semantic drift has bleached the term “rhetoric” of some of its original cachet. Today, it often refers to divisive commentary that reflects “party-line” thinking, at least in the context of political discourse. Even so, Aristotle’s insights resonate with contemporary theories of persuasion and framing, as we discuss throughout this article.

The concept of “framing” developed over the course of the 20th century, spurred by interest across various disciplines, including psychology, computer science, anthropology, sociology, linguistics, communication, media studies, artificial intelligence (AI), and political science (for historical reviews, see K. Sullivan, 2023; Tannen, 1993). This literature is vast, messy, and complicated (for pointed critiques, see Cacciatore et al., 2016; Entman, 1993; van Dijk, 2023). One problem is that there is no single, good definition of frames or framing. Sometimes “frame” has referred to a feature of memory or cognition; other times it has referred to a feature of language or communication (Druckman, 2001; K. Sullivan, 2023). Tracing the evolution of these ideas is illuminating. The linguist K. Sullivan (2023) recommends differentiating among frames that operate at the level of thought (*cognitive frames*), linguistic meaning (*semantic frames*), and social communication (*communicative frames*). Following her lead, in this section we discuss the nature and origins of each conception of “frame” across different academic disciplines (see Table 1).

### Cognitive frames

Psychologists and early AI researchers originally used the word “frame” to refer to a type of memory or knowledge structure, closely related to concepts such as “scripts,” “schemas,” “prototypes,” and “cognitive

**Table 1.** Different Conceptions of “Frame” in the Academic Literature

Type of frame	Definition	Example
Cognitive	Relatively abstract, structured knowledge about some aspect of reality; includes information about typical objects, participants with specific roles, causal relationships, and sequences of events; used to interpret experience, guide behavior, and anticipate how situations will unfold; related to other psychological constructs such as “schemas,” “scripts,” “prototypes,” and “cognitive models”; also called “frames in thought”	Your “university” frame includes elements such as a <i>campus, academic buildings, professors, students, degrees, majors, dorms, a library, and administrators</i> . If you are in the United States, it may also include <i>fraternities, sororities, and football</i> . This frame is complex, including other features such as when students generally apply, how to behave in the classroom, and much more.
Semantic	Basic cognitive frames that are evoked by language; clusters of related words will evoke the same semantic frame, which facilitates comprehension; according to “frame semantics,” we understand the meaning of words by virtue of the conceptual knowledge—the semantic frames—they evoke; also called “linguistic frames”	The “competition” frame includes elements—and is evoked by words—such as <i>competitors, winners, losers, venue, rank, place, and score</i> . It can apply to descriptions of many events, such as basketball games, presidential elections, and spelling bees.
Communicative	The structure or content of a linguistic message that communicates a particular viewpoint or cognitive/semantic frame to the receiver; also called “message frames” or “frames in communication”	The frames “limited English proficient,” “English learner,” and “emergent bilingual” communicate different ideas about the language skills and potential of U.S. children whose first language is not English.

models” (Bartlett, 1932; Bower et al., 1979; Gentner, 1983; Kintsch & van Dijk, 1978; Lakoff, 1987; Mandler, 2014; Minsky, 1974; Rosch, 1983; Rumelhart, 1975; Schank & Abelson, 1977). Although these terms have subtly different connotations, they all refer to what the linguist Deborah Tannen (1993) calls “structures of expectation”: general knowledge about the world that we use to interpret experiences, guide our behavior, and anticipate how events will unfold. A situation that is inscrutable at first—such as seeing a dozen children waltz into your neighbor’s house holding strange packages—becomes meaningful once you apply the proper frame (“Oh, it’s little Chloe’s *birthday party*”).

A related conception of frames was developed independently by the sociologist Erving Goffman. In his influential book *Frame Analysis: An Essay on the Organization of Experience* (Goffman, 1974), Goffman described frames as the organizational structures in the mind that enable us to make sense of the natural and social world. He explains: “When the individual in our Western society recognizes a particular event, he tends, whatever else he does, to imply in this response (and in effect employ) one or more frameworks or schemata of interpretation” (p. 21).

Importantly, the composition of a frame is relatively abstract. It includes information about typical objects, participants with specific roles, causal relationships between them, and sequences of events—but not idiosyncratic details. For example, your “child’s birthday party” frame includes prototypical elements such as *a group of kids gathering in a single place, brightly colored balloons, giving wrapped presents to the birthday kid,*

*blowing out candles, eating cake, unwrapping presents,* and so on. It does not include details such as *everyone dresses in a fur catsuit*, even if that’s how your sister’s kid celebrated last year (don’t ask).

Of course, not all birthdays contain every element of your birthday frame. Maybe your sister is afraid of balloons, so she does not purchase them for your niece’s party. Even so, your birthday frame will still be invoked by other party features, which will allow you to easily identify the event and what people will do there. Things would be different if no one ever used balloons at kids’ birthday parties. The specific content of your frames is based on general patterns your brain extracts from your everyday experiences and culture (DiMaggio, 1997; Rogers & McClelland, 2004; Strauss & Quinn, 1997). If you grew up in a community in which birthday parties featured furry outfits, spinach tarts, and 90 min of silence, you would expect to see such features at any future party. And so would others from your community. It is important that our expectations for how the world works—our frames—align with those of other community members. This “common ground” forms the foundation for successful language comprehension and social coordination (Clark, 1996), leading some scholars to view cognitive frames as key to understanding culture (DiMaggio, 1997; Swidler, 1986).

Note, however, that this sense of the word “frame” concerns what we know and how we think, not necessarily what we say. We can tap into our knowledge of birthday parties without using or hearing words such as “presents” and “cake.” That is why this type of frame is called a “frame in thought” (Druckman, 2001) or a

“cognitive frame” (Fillmore, 2008; K. Sullivan, 2023). Cognitive frames are not stored in isolated files in your brain and activated on command like an mp3 on your laptop. Rather, our world knowledge is organized into a vast web of interconnected conceptual networks at varying levels of abstraction that function together as we navigate our environments. Fully understanding a birthday party also requires knowing how people keep track of someone’s age, basic addition, parent–child relationships, behavioral norms for social gatherings, and much more. As Goffman (1974) observed: “During any one moment of activity, an individual is likely to apply several frameworks” (p. 25). Thus, cognitive frames form an integrated system of conceptual knowledge, derived from experience, that shape how we process information, make sense of our surroundings, and structure our behavior. This is why many policy interventions aimed at improving educational and economic outcomes seek to reshape people’s cognitive frames. For example, much work has gone into helping students adopt a “growth mindset” in school—a cognitive frame that stipulates intelligence and academic skills can improve through practice and hard work (e.g., Yeager et al., 2019; but see Macnamara & Burgoyne, 2023).

### **Semantic frames**

In linguistics, interest in frames arose from a desire to explain how people understand language in context. This is evident within the “frame semantics” approach to word meaning pioneered by Charles Fillmore (e.g., Fillmore, 1982, 2008; Fillmore & Baker, 2009). Frame semantics draws heavily on the concept of cognitive frames described in the previous section (Fillmore, 1982; K. Sullivan, 2023). In so doing, it rejects the view that understanding a word involves retrieving a unique definition or mental image. Rather, according to frame semantics, “people understand the meaning of words largely by virtue of the **frames** which they **evoke**” (Ruppenhofer et al., 2016, p. 7; emphasis in original). That is, the “meaning” of any given word is grounded in our world knowledge and coupled with clusters of other words that evoke the same frame. For example, words such as “bride,” “groom,” “wedding,” “divorce,” “wife,” “husband,” and “honeymoon” all evoke the “marriage” frame; it is difficult to understand any one of these words without also knowing the others because they all specify roles or events within a single knowledge structure. Reading that “Mary *honeymooned* in Paris after she *wed* Bill” evokes the marriage frame, which helps you understand the relationship between the two individuals and thus the meaning of the sentence.

Frames that are evoked by words in this way are called “linguistic” or “semantic” frames because they are directly tied to how we derive meaning from

language. This should not be confused with “linguistic framing,” which is our generic term for the use of a particular aspect of language to describe an issue or situation (see the discussion of communicative frames below). Semantic frames represent “story fragments” in the mind (Ruppenhofer et al., 2016)—not complex scripts, narratives, or schemas—because they often comprise narrow slices of more elaborate cognitive frames (K. Sullivan, 2023). For example, you can understand the word “bought” in the sentence “José bought apples at the store” because it evokes the frame of *commercial transactions*, with a *buyer*, *seller*, and *exchange of goods for money*. Going to the grocery store, on the other hand, activates a much more elaborate set of cognitive frames that structure your expectations and behavior for the entire sequence of events, none of which necessarily involves language. All your tacit knowledge of commercial transactions, nutrition, credit cards, ripe fruit, budgeting, waiting in line, and much more is needed to successfully navigate this excursion. By contrast, a semantic frame is more limited, consisting only of the knowledge structures evoked by hearing or reading a specific word in context.

Fillmore and colleagues have cataloged hundreds of semantic frames evoked by thousands of English words and the relationships among them, revealing a rich tapestry of interconnected meanings (see <https://framenet.icsi.berkeley.edu>; see also Ruppenhofer et al., 2016). Frame semantics is not the only theory in town when it comes to word meaning, but it is consistent with various psychological theories of language comprehension, as discussed in the “Mechanics of Communication and Linguistic Framing” section. Notably, this view of language seems to entail that all linguistic communication involves framing because every message will evoke certain semantic frames and not others. One exception might be a conventionalized greeting, such as saying “hello” to a coworker. Yet “hello” would elicit a very different response than “salutations, your highness.” The latter greeting evokes the “monarchy” frame and may be interpreted as sarcasm (unless you happen to work for the royal family). If you are interested in framing, it is important to recognize that different linguistic forms, whether wildly dissimilar or almost interchangeable, may invite different reactions to a message (for discussions of how frame semantics informs theories of framing in contemporary political discourse, see Lakoff, 1996, 2008, 2014).

### **Communicative frames**

We described earlier how liberal and conservative pundits talk about hot-button issues such as abortion in the United States. We suggested this was no accident:

Politicians, journalists, and activists all use language—as well as images, sounds, and presentation style—with the specific intention of shaping social discourse and influencing public opinion. This is what many people view as a paradigmatic instance of framing. As political communication scholar Robert Entman (1993) explained: “Framing essentially involves *selection* and *salience*. To frame is to *select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation*” (p. 52). Note the emphasis here is on how (and perhaps why) a frame is communicated in a message, not how it is represented in people’s minds. That is why this is referred to as a “message frame,” a “frame in communication” (Druckman, 2001), or a “communicative frame” (K. Sullivan, 2023).

To be sure, the ultimate goal for many communicators is to instantiate a particular cognitive or semantic frame in the target audience to influence attitudes (e.g., the “murder” frame for thinking about abortion). But this goal may or may not be achieved. The key distinction, then, is that a communicative frame describes message structure or content that cues “a particular problem definition” rather than the internal thought processes of the person exposed to the message. Sometimes speakers intentionally craft a message to provide the audience with a particular “causal interpretation” or model of a target issue, as is often the case in political, business, and legal communication. This deliberate use of language in service of persuasion is the archetype of communicative framing and of particular interest to many social scientists (Druckman, 2001; Entman, 1993; Schwartzstein & Sunderam, 2021). In other cases, however, a message may be generated spontaneously without careful consideration of the information it communicates to the audience. This can result in unanticipated framing effects, with unintended consequences (see, e.g., our discussion of subject-complement framing in the “Beliefs” and “Pragmatic Inference” sections). We consider both types of messages to be examples of communicative frames.

Anthropologist and cyberneticist Gregory Bateson was among the first to consider the communicative function of frames, which he discussed in an influential article on play and fantasy (Bateson, 1972/1987). Bateson was struck by the way young monkeys engage in “play fighting” without devolving into real conflict. Somehow, he surmised, signals must be exchanged to ensure the “play” frame governs their interaction—and something similar must be going on with human play and other complex social rituals. Communication is critical for social coordination, and, in his view, frames

are critical for effective communication. According to Bateson, frames are “metacommunicative” because they contain information about how the interlocutor should make use of the communicative signal: “Any message, which either explicitly or implicitly defines a frame, *ipso facto* gives the receiver instructions or aids in his attempt to understand the messages included within the frame” (p. 145). We offer this useful way of thinking about communicative frames throughout the article.

Interestingly, Goffman (1974) credited Bateson for inspiring his own thinking about this subject. Although Goffman focused on cognitive rather than communicative frames (Druckman, 2001), his frame analysis book highlighted different ways that people send signals to transform how others organize their understanding of reality. For example, advertisers can promote the view that cars represent a life of pleasurable leisure by pairing them with certain images or labels. This social, communicative conception of a frame closely aligns with contemporary work on framing in politics, media, law, and communication. The FrameWorks Institute, for instance, is a nonprofit, progressive think tank that researches the efficacy of different communicative frames for explaining complex sociopolitical issues and promoting systemic reforms.

### ***Framing effects***

For decades, researchers have focused on measuring and explaining the impact of different (communicative) frames on cognition and behavior. This is the study of *framing effects*—a topic that traverses a range of theoretical and empirical methods across disciplines. Research on framing effects is primarily concerned with linguistic features of a message that influence how people respond to that message (although framing can extend to other modalities as well, such as imagery; e.g., Powell et al., 2015). In this way, research on framing is both broader and narrower than research on rhetoric and persuasion. It is broader because it addresses how any language encountered impacts attitudes and behavior, not just language used in the context of explicitly rhetorical communication. But it is narrower because the focus is on language specifically, not other elements of persuasion such as a speaker’s style or charisma (although language is known to affect how speakers are perceived; see “Social-Pragmatic Mechanisms” section). In the next section, we survey various ways that language can influence an audience. For this article, we take a big-tent approach to linguistic framing effects. We include any research in which a change in linguistic structure or content has a measurable impact on a receiver’s thoughts, feelings, or actions.

## What Does Language Do? Measuring the Effects of Linguistic Framing

One way to approach the study of language is to examine how it differs from other cognitive abilities. For example, researchers often aim to identify unique computational processes and brain networks that support language comprehension and use (e.g., M. D. Hauser et al., 2002; Malik-Moraleda et al., 2022). Another approach is to examine how deeply connected language is to other elements of our cognitive ecology. This is where research on linguistic framing lives. Below, we discuss different ways researchers have measured the impacts of language, revealing the wide range of influences language can have on cognition and behavior.

### Attention and perception

Have you ever been engrossed in a conversation at a crowded event, discussing the ins and outs of Colombian architecture or Japanese whiskey (or whatever floats your boat)? With your full attention on your interlocutor, other sounds in the space fade into a background murmur. But then, to your surprise, you suddenly hear someone across the room say your name, even though you hadn't even realized they were there. This "cocktail party effect," a classic phenomenon in the attention literature, shows how certain linguistic signals—those especially pertinent to us—automatically capture our attention even when our focus is elsewhere (Moray, 1959; Shapiro et al., 1997; Wood & Cowan, 1995). This is one reason why people are more likely to click on marketing emails with their name in the subject line (Sahni et al., 2018) and to give careful thought to products or resumes that share a name similar to their own (Howard & Kerin, 2011).

Language can also help you find things in your environment. Hearing a noun such as "chair" or a preposition such as "above" will automatically direct your attention toward the corresponding object or region of space (Logan, 1995). If your task is to search for a specific item—such as a vertical red line among lines of other colors and orientations, or a specific probe appearing next to a set of 5s and 2s—then hearing a word that cues the target—such as "red" or "five"—will make your search more efficient (Hommel et al., 2001; Lupyan & Spivey, 2010b; Reali et al., 2006). Even quantifier words such as "each" and "every" guide attention, and in slightly different ways: "Each" leads to a focus on individual objects, whereas "every" facilitates grouping (Knowlton et al., 2022).

The tight connection of language to attention and perception means that simply hearing a label can help you detect otherwise imperceptible objects shrouded

in visual "noise" (Lupyan & Ward, 2013; see also Holmes & Wolff, 2013; Lupyan & Spivey, 2010a). In fact, linguistic framing also figures into how we resolve sensory ambiguity, which can shape our conscious experiences. A few years ago, for example, a viral video showed someone activating a toy that emitted a garbled English phrase. What you hear changes depending on whether you have just read the word "brainstorm" or "green needle" (to experience this delightful auditory illusion for yourself, see <https://tinyurl.com/2dvp8rn8>).

Most effects of language on perception are not described as examples of framing because their locus is in immediate sensory processing rather than "higher level" conceptualization or reasoning. In line with Lupyan et al. (2020) and other cognitive scientists, however, we see these processes as tightly connected. If language drives our attention and guides what we perceive, this can be expected to have downstream consequences for other aspects of cognition. And, as we discuss in the following subsections, it does.

### Beliefs

Language is often used to influence beliefs about the state of the world: When I tell you it's raining outside, you'll know to bring an umbrella. Language can also shape beliefs about how the world works, and often in subtle ways. For example, we indicated earlier that war metaphors—which are prevalent in everyday discourse (Flusberg et al., 2018)—can increase our sense of urgency about social and political issues (Flusberg et al., 2017). War metaphors can also shape our beliefs. Several studies have contrasted the use of "battle" and "journey" metaphors in discourse about cancer, both of which are common in descriptions of the disease (D. J. Hauser & Schwarz, 2020; Hendricks et al., 2018; Magaña & Matlock, 2018; Semino et al., 2017, 2018). In one study, participants read a story about a man recently diagnosed with cancer, framed using either battle or journey metaphors (D. J. Hauser & Schwarz, 2020; vignette adapted from Hendricks et al., 2018):

Joe was just diagnosed with cancer. He knows that for the foreseeable future, every day will be a *battle against [journey with]* the disease. The *battle [road]* he has to *fight [take]* will not always be an easy one. Many people have written about their experiences on the *battlefield [path]*, and he can turn to those for consolation. His friends and family want him to know that he will not be alone in his *battle [journey]*. Even though sometimes he might not feel like talking, other times he may want to share stories of his *battle [journey]* with others, and they will be there for those moments.

Participants then rated their agreement with a series of statements expressing fatalistic beliefs about cancer (e.g., “If someone is meant to get cancer, they will get it no matter what they do”). Those who had read the battle-framed story endorsed fatalism more strongly than those who had read the journey-framed story. As we discuss further in the “Figurative Framing” section, metaphors are especially effective for shaping beliefs about abstract and complex issues such as cancer because they leverage what you know—your cognitive frames—about more concrete, familiar domains such as battles and journeys.

Other forms of linguistic framing can shape beliefs as well (e.g., Chestnut et al., 2021; Chestnut & Markman, 2018; Holmes et al., 2022; Nelson & Oxley, 1999; Schaffner & Atkinson, 2009). In one experiment, participants read a press release about a real study that analyzed 3 years of standardized math test scores, revealing that boys and girls performed equally well (Chestnut & Markman, 2018). For some participants, the report began with the statement “A recent study has shown that girls do just as well as boys at math.” This places “boys” in the complement position of the sentence (i.e., the reference point) and “girls” in the subject position. For others, the positions were reversed (“boys do just as well as girls at math”). Participants were then asked which group was naturally more skilled at math (or must work harder to be good at math). The results showed that the group in the complement position was viewed as more innately math-inclined. Notably, using a different sentence structure (“girls and boys do equally well at math”) eliminated the bias to believe that one group was better than the other. We discuss this further in the “Social-Pragmatic Mechanisms” section. For now, we simply highlight that even exceedingly subtle differences in language can shape beliefs.

## **Attitudes**

Some of us love anchovies but loathe raisins, enjoy musical theater but dislike opera, and adore puppies but have an aversion to snakes (you may feel otherwise, of course). The previous sentence describes a set of *attitudes*: “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly & Chaiken, 1993, p. 1). Attitudes play an important role in our daily lives and influence how we navigate our physical and social environments (although the relationship between attitudes and behavior can be complicated; Ajzen et al., 2018; Fazio, 1986). As a result, a central goal of many persuasive appeals is to change how people *feel* about a given issue. Much

research has focused on the process by which this occurs (Albarracín et al., 2018; Perloff, 2017; Petty & Cacioppo, 1986). The structure and content of the message matter: Linguistic framing has been shown to shape attitudes toward other people, objects, events, and social problems (e.g., Chatruc et al., 2021; Flusberg, van der Vord, et al., 2022; Landau et al., 2009; Landau & Keefer, 2014; Levin & Gaeth, 1988; Nelson & Kinder, 1996; Rook & Holmes, 2023; Thibodeau, Crow, & Flusberg, 2017).

For example, people express more favorable attitudes toward ground beef labeled “75% lean” (positive framing) compared with “25% fat” (negative framing). They report it to be less greasy, higher quality, and better tasting (Levin, 1987). This effect is observed even when people take a bite of the beef after receiving the linguistic frame (Levin & Gaeth, 1988; see also Anderson & Barrett, 2016). In a study by Schmidt et al. (2017), participants tasted an array of wines while their brain activity was measured through neuroimaging. All the wines cost the same amount of money, but participants saw different price labels for each one during the experiment. The results showed they preferred wines that had been framed as more expensive, and this was mediated by activity in the brain’s valuation system (see also Werner et al., 2021). In other words, from the perspective of their brains, the pricier-framed wines actually tasted better.

Framing manipulations can also shape attitudes toward important social issues. In one set of experiments, researchers examined how different group labels influenced American participants’ attitudes toward people living in the United States without authorization (Rucker et al., 2019; see also Ommundsen et al., 2014). An initial study revealed that the labels “illegal aliens,” “illegal immigrants,” and “undocumented aliens” were perceived as more negatively valenced than the labels “undocumented immigrants” and “noncitizens.” In a follow-up framing experiment, participants received one of those five group labels in the instructions prompt: “The following questions deal with your thoughts about the term [group label]. As you know, the issue of [group label] in the United States is hotly debated right now.” Next, they used a “feelings thermometer” to register their attitudes toward the group on a scale from *extremely cold* to *extremely warm*. Participants who received the “illegal aliens,” “illegal immigrants,” or “undocumented aliens” labels expressed significantly more prejudiced (colder) attitudes than those who received the “undocumented immigrants” or “noncitizens” labels. This shows how negative associations conjured by a simple word or phrase can subtly shape attitudes.



## Memory

Some words and phrases are more memorable than others, such as those that evoke negative feelings (Aka et al., 2021, 2023). This may boost their influence and facilitate accurate retrieval of a message or idea later on. But language can also bias how you respond to questions about the past. For example, try to recall the last movie you saw in a theater. How long was the film (in minutes)? Research suggests that your estimate would be reduced if we instead asked, “How *short* was it?” (Harris, 1973; Lipscomb, Bregman, & McAllister, 1985; Lipscomb, McAllister, & Bregman, 1985; see also Inbar & Evers, 2022; Stephensen et al., 2021).

Psychologist Elizabeth Loftus conducted many pioneering studies that suggested leading questions can distort eyewitness memory (e.g., Loftus, 1975; Loftus & Palmer, 1974; Loftus & Zanni, 1975). In two famous experiments, Loftus and Palmer (1974) investigated the impact of verb intensity on memory for vehicular accidents. Participants watched a series of short video clips depicting traffic accidents. After each one, they wrote an account of the accident and answered questions about what they had seen. The critical question asked participants to estimate the speed of the cars during the collision, and the intensity of the verb in this question varied across conditions: “About how fast were the cars going when they [*contacted* vs. *hit* vs. *bumped* vs. *collided* vs. *smashed*] each other?” The results showed that more intense verbs led to greater speed estimates. For example, “smashed” resulted in a mean estimate of 40.8 miles per hour, whereas “contacted” led to an estimate of only 31.8 miles per hour.

In a follow-up study, participants watched a single video of a multicar accident and then answered the same questions as before. This time, one third of participants received the verb “smashed” in the critical probe question, another third received “hit,” and the remaining third watched the video but received no communicative frame. Once again, the more intense verb led to greater speed estimates. The innovative feature of this study was that participants were asked to come back to the lab a week later and indicate whether they had seen any broken glass in the video they watched the previous week. Those in the “smashed” condition were more than twice as likely as those in the “hit” and no-framing conditions to report having seen broken glass. Yet no broken glass had been visible in the crash film. This suggests that the critical verb not only skewed participants’ memory for the accident but also led them to remember details that did not exist.

There is another explanation for these classic findings, however. The verb may have only affected participants’ *reports* of the accident, not their *memory* of

it (McCloskey & Zaragoza, 1985). That is, participants who do not remember the accident very well may simply respond in a way that is compatible with the leading question—reporting a relatively high speed and broken glass when questioned with “smashed,” for example. On this account, participants’ responses reflect the intensity of the verb not because the question distorted their memory but because it is the only information they have to rely on. On a practical level, whether framing alters memory per se may not matter much. So long as different words or phrases lead people to give different accounts of their experiences, this could have important consequences for eyewitness identification and other real-world decisions (Loftus, 1979). More problematic is that Loftus and Palmer’s (1974) findings have not been consistently replicated (e.g., Goldschmied et al., 2017; Lipscomb, Bregman, & McAllister, 1985; McAllister et al., 1988; J. D. Read & Bruce, 1984; J. D. Read et al., 1978), which may preclude any practical applications of the findings. We have more to say about the importance of replication in studies of linguistic framing in the “Opportunities for Future Research” section.

However, many similar studies have shown that language can interfere with tasks in which people must recall what they have seen (e.g., Alogna et al., 2014; Carmichael et al., 1932; Lupyan, 2008; Meissner & Brigham, 2001; Melcher & Schooler, 1996; Schooler & Engstler-Schooler, 1990; Wang & Gennari, 2019). An early demonstration of this phenomenon comes from a study by Leonard Carmichael and his colleagues (1932). Participants viewed a set of simple line drawings (e.g., a shape that looked roughly like O–O) and were tasked with reproducing them. Some participants received a particular set of labels alongside the images (e.g., “eyeglasses”), whereas others received a different set of labels that could also apply (e.g., “dumbbells”). When participants later redrew the images from memory, they unwittingly introduced changes to make the image better match the label accompanying it. For example, the “eyeglasses” group drew something like O^O, whereas the “dumbbells” group drew something more like O=O (apologies for our primitive ASCII art skills). These findings, like Loftus and Palmer’s (1974), may reflect the influence of language in our recollections rather than the direct impact of language on visual memory (McCloskey & Zaragoza, 1985). Someone who remembers only the label “eyeglasses” will tend to produce a drawing that looks more like O^O than O=O (Hanawalt & Demarest, 1939), but this does not mean their memory of the drawing was somehow fused with the label. Nevertheless, research on language and memory demonstrates how elements of our cognitive and semantic frames, cued by language, can subtly distort our recollections.

### **Reasoning, judgment, and decision-making**

One of the most seminal framing experiments in cognitive psychology goes something like this (adapted from Tversky & Kahneman, 1981): Imagine you're the mayor of a small city preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Your health minister presents you with two alternative programs to address the outbreak. You must now decide which one to implement:

- A. If Program A is adopted, 200 people will be saved.
- B. If Program B is adopted, there is a one-third probability that all 600 people will be saved and a two-thirds probability that nobody will be saved.

This is a study of judgment and decision-making. Your task is to think about this dire situation and make the most optimal choice. In the original version of the experiment, 72% of participants selected the sure option, A, rather than the uncertain option, B. Now imagine that your health minister had provided the following two options instead:

- C. If Program C is adopted, 400 people will die.
- D. If Program D is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die.

In this case, 78% of participants in the original study selected Option D, the risky choice. Notice, however, that Options A and C are logically equivalent: If 200 people are saved, that means 400 will die, because 600 people were initially expected to perish in the outbreak. A parallel equivalence holds for Options B and D. Framing choices in a positive manner, as lives saved (a “gain” frame), leads people to select the sure option, whereas framing them in a negative manner, in terms of deaths (a “loss” frame), leads people to select the riskier option. The “risky-choice” framing paradigm has been quite influential in fields such as health communication and behavioral economics, and variations of this basic study design have been used thousands of times across these fields (for meta-analyses, see Kühberger, 1998; Steiger & Kühberger, 2018).

Many other studies ask participants to solve problems, make decisions, or otherwise engage in reasoning about an issue that has been framed in a particular way (Flusberg et al., 2020; Thibodeau, 2016; Thibodeau & Boroditsky, 2011, 2013). In some cases, participants freely generate their own solution to a problem, which is then coded by the experimenters or naive raters (e.g.,

Thibodeau & Boroditsky, 2011). In other experiments, participants must choose between two or more response options, as in the risky-choice framing paradigm. In one such study, participants read a series of vignettes about various everyday issues (e.g., crime, politics, billiards, medical research), each one framed using one of two metaphors (Thibodeau, 2016). After reading each vignette, participants answered a question by selecting between two response options, each conceptually congruent with one of the metaphor frames. For example, a cancer researcher was described as imagining herself either “scaling a mountain” or “working on a puzzle” while conducting her research. Participants were asked to make a prediction about the researcher’s process. Does she “look for connections by testing completely novel theories” (congruent with the puzzle metaphor) or “gain ground by using methods that are simple to follow” (congruent with the mountain metaphor)? Across all target issues, participants were about 10% more likely to choose the metaphor-consistent response option. This illustrates how cognitive frames evoked by metaphor can guide people’s reasoning.

### **Behavior**

Most of the studies we have considered so far elicited effects of language in the laboratory. That’s not a bad thing. Lab studies give researchers control over many extraneous variables that impact human behavior, enabling them to better establish causal relationships of interest. Still, most of us want to know whether the effects we carefully isolate in the lab generalize to the real world. This is difficult to ascertain for several reasons, including ethical considerations, time, and money—three things that researchers struggle with.

One stepping stone to reality is to assess behavioral *intentions*. In many framing studies, participants are asked to indicate whether they plan to take some action in the future or to rate their likelihood of engaging in a particular behavior (e.g., Flusberg et al., 2017; Gerend & Shepherd, 2007; D. J. Hauser & Schwarz, 2015, 2020; Thibodeau & Flusberg, 2017). In one study, for example, female college students rated their intentions to obtain the human papillomavirus vaccine after reading a booklet that used either a gain frame (i.e., discussing the benefits of receiving the vaccine) or a loss frame (i.e., discussing the costs of not receiving it; Gerend & Shepherd, 2007; for additional context on this paradigm, see our discussion of goal framing in the “Valence Framing” section). The loss frame increased intentions to get the vaccine, but only for participants who reported multiple sexual partners and rarely used contraception. The relationship between intentions and behavior is complicated, however, and people do not

always follow through on what they say they will do (Conner & Norman, 2022; Sheeran & Webb, 2016; for a meta-analysis of the intention-to-behavior literature, see Webb & Sheeran, 2006). Therefore, there are limits to what we can conclude from studies of behavioral intentions.

One way to get at behavior more directly is to analyze naturally occurring data sets that involve interactions between people using systematically different communicative frames. For instance, one study examined nearly 200 medical emergency call transcripts from the Perth, Australia, metropolitan area over 2 years (Riou et al., 2017). Protocol dictates that emergency operators use a scripted prompt to elicit information from the caller: “Okay, tell me exactly what happened.” About 60% of the time, however, the operators spontaneously shifted from the past tense to the present perfect tense, saying instead, “Tell me *what’s* happened.” This subtle change was associated with substantially different response patterns from the callers. Whereas the prompt in the past tense tended to elicit longer, narrative accounts of what led them to place the call (18 s on average), the prompt in the present perfect elicited shorter, more direct reports (9 s on average). This translated into a nearly 15% faster ambulance dispatch time in the latter case (from 58 to 50 s). A similar study from the United Kingdom found that people in crisis were more likely to reject a proposal for dialogue when police negotiators used the verb “talk” than when they used the verb “speak” (Sikveland & Stokoe, 2020).

Nothing beats a randomized experiment for establishing causal relationships between variables, however. As a result, some of the most eye-catching framing studies have used a field study design to measure real-world behaviors (e.g., Bryan et al., 2011; Chou & Murnighan, 2013; Heritage et al., 2007; Hershfield et al., 2020). In one study, conducted on the eve of the 2008 U.S. presidential election, registered California voters recruited on social media completed a 10-item election survey (Bryan et al., 2011). For half of the participants, the survey questions used a noun form to refer to the act of voting (e.g., “How important is it to you to *be a voter* in tomorrow’s election?”). For the other half, the survey questions used a verb form (e.g., “How important is it to you to *vote* in tomorrow’s election?”). After the election, an analysis of voting records revealed that those exposed to the noun frame were almost 14% more likely to vote in the election than those exposed to the verb frame (95.5% vs. 81.8% voting rate). Similar results were later found in a New Jersey gubernatorial race, and related work has extended this methodology to nonvoting contexts (Bryan et al., 2011, 2013, 2014).

More recently, however, other researchers have failed to replicate the original effect on voting behavior

(Gerber et al., 2016, 2018, 2023). This may be because it is difficult to conduct exact replications in the field (Bryan et al., 2019), and heterogeneous samples and methods will yield noisy results for any behavioral intervention, including framing studies (Bryan et al., 2021). We explore some of this heterogeneity later on when discussing moderators of linguistic framing effects. For now, we turn to general mechanisms that give rise to these effects.

## Mechanics of Communication and Linguistic Framing

When scholars write about framing, they tend to focus on the framing manipulation (“we emphasized gains versus losses”) and the framing effect (“the loss frame led to increased behavioral intentions”). Emphasizing the outcome, rather than the process, may contribute to the perception that the framing literature is “fractured” (Entman, 1993), consisting of hundreds of isolated “effects” without any organizing framework (or cognitive frame). Viewing framing through the lens of human communication helps to address this concern. This perspective connects research on the cognitive science of language and reasoning with insights from the study of persuasion and social influence. It also reveals how a few general mechanisms can account for a broad range of framing effects. We begin this section by briefly discussing language comprehension. We then unpack the cognitive, social-pragmatic, and emotional processes that give rise to framing effects in everyday communication. We conclude by relating this work to a leading theory of persuasion and questioning the popular view that framing effects reflect the irrational side of human cognition.

### *Making sense of language*

Many species use sophisticated communication systems, but human language differs in several key respects. For one, language is far more complex and flexible: The typical person knows many thousands of (mostly) arbitrary symbols or words, which can be combined and reformatted to express an infinite number of ideas. This makes language a productive or “generative” system. We can also use our words to communicate about people, places, objects, events, and ideas beyond the here and now (e.g., “The stingy extraterrestrials insisted on buying the cheapest spaceship, which led to the crash”). This property, called “displacement,” exists only in very limited forms in the rest of the animal kingdom (e.g., in the honeybee’s “waggle dance,” used to communicate the location of its most recently visited flowers; von Frisch, 1967).

Put together, these unique characteristics enable what linguist Daniel Dor (2015) describes as the central function of language: the “instruction of imagination.” To an unprecedented degree, we can recreate our thoughts, intentions, and experiences in the minds of our interlocutors. This is not a direct transfer of information, such as sending an email attachment that someone downloads onto their neural hardware (cf. Reddy, 1979). Rather, understanding language is an active, reconstructive process. As Dor (2015) puts it:

The speaker provides the receiver with a code, a plan, a skeletal list of the basic coordinates of the experience—which the receiver is then expected to use as a scaffold for experiential imagination. Following the code, the interlocutor raises past experiences from memory, and then reconstructs and recombines them to produce novel, imagined experiences. (p. 2)<sup>1</sup>

The “code” consists of the specific sequence of words that a speaker uses to deliver their message. In spoken or signed conversations, as opposed to writing, the code might also include other factors such as our tone of voice, gestures, and facial expressions (Kita & Emmorey, 2023). The reader or listener must then “decode” these communicative signals. This requires generating a *mental model* of the situation or events described in the text—also called a mental “simulation” or “situation model” (Bergen, 2012; Graesser et al., 1997; Johnson-Laird, 1983; Zwaan & Radvansky, 1998). If the situation model aligns with the speaker’s intended message, then successful language comprehension has occurred.

Decoding a linguistic message isn’t like translating Morse code into English, however. As Dor (2015) notes, linguistic messages are “skeletal”—they are underspecified, and the receiver must fill in details based on context, shared background knowledge, and inference. This process is dynamic, unfolding over time as we process a message and activate relevant semantic and cognitive frames. We anticipate what information will come next and use our working mental model to interpret the communicative signals as they arrive (Christiansen & Chater, 2022; Pickering & Gambi, 2018). All this takes place in a social context, between speaker and listener, writer and reader, in which certain norms and rules constrain how we respond and react. It also takes place in a biological context: Reasoning is not a purely logical, symbolic process but a deeply embodied one that is suffused with imagery, emotion, and physical movement (Bergen, 2012; Lakoff, 1987).

Ultimately, our situation models are the basis for further reasoning about the topic of conversation, guiding how we answer questions and make decisions. Framing

a message in a particular way encourages the reader or listener to construct a corresponding mental model, which may have downstream consequences for attitudes, judgments, and behavior. In the next few sections, we unpack the cognitive, social-pragmatic, and emotional mechanisms that support language comprehension and reasoning and thus underlie many framing effects. This provides a general framework for understanding how framing works. For a summary, see Table 2.

### **Cognitive mechanisms**

**Schematic structuring.** Earlier we defined cognitive frames as a form of memory comprising relatively abstract knowledge about the world that we use to make sense of our experiences. This type of prior knowledge is critical for forming rich situation models from language. Consider, for example, the following piece of gastronomic fiction (inspired by Bower et al., 1979):

Isabel went to a restaurant.

She ordered a burger but sent it back because it was overcooked.

A while later, she left in a hurry.

This story never explicitly mentions that Isabel *sat down* at the restaurant, *looked at a menu*, *spoke with a server*, or *received a bill* for her meal. And yet you likely assumed that those events took place—they were present in your situation model (Bower et al., 1979). This is because words such as “restaurant” and “ordered a burger” evoke a particular cognitive or semantic frame, the “restaurant” frame, which includes these elements. Other knowledge stored in memory informed your interpretation of the story as well. For instance, you probably inferred that Isabel doesn’t like well-done beef—otherwise, why would she send the burger back? As to why she left in a hurry, you can’t know for sure. Situation models can be schematic or fuzzy. But several plausible reasons come to mind that are consistent with this event. Maybe Isabel left without paying because she didn’t like the food and wanted to get away quickly. Or maybe she just had somewhere else to be. Regardless, notice what happens when we change the organizing frame in the story:

Isabel went to a friend’s barbecue.

She ordered a burger but sent it back because it was overcooked.

A while later, she left in a hurry.

Now your interpretation of the story—the content of your situation model—is quite different. You no longer

**Table 2.** Psychological Mechanisms That Contribute to Linguistic Framing Effects

Mechanism	Explanation	Example
<b>Cognitive</b>		
Schematic structuring	Cognitive and semantic frames evoked by a message influence how people organize their mental model of a target issue, licensing certain patterns of reasoning.	Participants were more likely to recommend enforcement-related solutions to a crime problem—such as hiring more police and building more jails—when crime was metaphorically framed as a “beast” as opposed to a “virus” (Thibodeau & Boroditsky, 2011). Enforcement is consistent with the beast frame.
Value reweighting	Issue-relevant values and beliefs invoked by a message seem more important and therefore figure more prominently in reasoning, especially when they resonate with the audience.	Liberal Americans expressed less support for Democratic presidential candidate Hillary Clinton after reading an anti-Clinton message that described her as violating the important liberal value of fairness as opposed to the more conservative value of loyalty (Voelkel & Feinberg, 2018).
Priming	Exposure to a message makes the ideas communicated in it (and related concepts) temporarily more cognitively accessible and therefore more prominent in evaluations and reasoning.	Participants rated ground beef as less greasy, higher quality, and better tasting when it was labeled “75% lean,” which primes positive associations, than when it was labeled “25% fat,” which primes negative associations (Levin, 1987; but see discussion in text on how emotional and pragmatic factors may explain related effects).
Processing fluency	Some prose is easier to process than other prose, making a message seem more persuasive.	Participants were more persuaded by audio narratives about the health risks of caffeine compared with nonnarratives, and this was mediated by greater processing fluency for narratives (Bullock et al., 2021).
<b>Social-pragmatic</b>		
Pragmatic inference	People read between the lines of a message and infer what the speaker intended to communicate, going beyond literal meaning.	When exposed to generic statements about a social group (e.g., “Zarpies are good at baking pizzas”), children and adults inferred that a member of an unmentioned group (“Gorps”) was <i>bad</i> at this skill (Moty & Rhodes, 2021). This did not occur for nongeneric statements (e.g., “This Zarpie is good at baking pizzas”).
Speaker inference	People draw inferences about the speaker’s attributes from the language they use (e.g., their identity, values, and character traits), which can bias their response to the message.	Conservatives were less likely to oppose a proenvironmental policy when it appealed to a need for closure—a trait conservatives exhibit more than liberals. This resulted from the fact that participants inferred the policy was proposed by a fellow conservative (Lammers et al., 2023).
<b>Emotional</b>		
Affective valence	Language evokes positive and negative feelings, which can influence attitudes and decision-making. Effects may be stronger (or weaker, in some cases) when the feelings are more intense or arousing.	Participants expressed more negative attitudes toward immigration when it was discussed using negatively valenced group labels such as “illegal aliens” compared with more neutral labels such as “noncitizens” (Rucker et al., 2019).
Discrete emotions	Language evokes specific emotions (e.g., anger, fear, sadness) that figure into evaluations and reasoning.	Dutch participants expressed more support for cooperation among European Union nations when economic investments were framed positively than negatively, and this was mediated specifically by enthusiasm and anger, not other emotions (Lecheler et al., 2013).

assume Isabel looked at a menu, talked to a server, or received a bill. Instead, she probably just asked for a burger from whomever was working the grill at the party. Maybe it was her friend who was hosting, or

perhaps it was her partner. You certainly haven’t inferred that Isabel left in a hurry because she didn’t pay for her food (unless that sort of transaction is typical at the barbecues you frequent). Maybe she was

embarrassed for sending food back at a friend's gathering because it was a socially awkward thing to do.

What these examples illustrate is that communicative frames guide the aspects of prior knowledge—our cognitive and semantic frames—that we use to organize and interpret the events described in a text or in speech. Different communicative frames lead people to construct different situation models, which then inform judgments and predictions about the situation. This is one of the central cognitive mechanisms that has been proposed for how linguistic framing works (Lakoff, 1996, 2008; Lakoff & Johnson, 1980; Thibodeau, Hendricks, & Boroditsky, 2017; Thibodeau et al., 2019). However, we want to flag that this is simply part of the normal process for making meaning from language.<sup>2</sup> To demonstrate this effect using a real-world example, let's examine the following viral Twitter (now X) exchange between *The Economist* magazine and user @ZachBoomG (can we call you Zach?), which took place on August 8, 2020. After you read the first post, ask yourself how you feel about the U.S. Postal Service (USPS). Then read Zach's reply and ask yourself if your attitude has shifted:

@TheEconomist: The USPS is viewed favourably by 91% of Americans despite billions in losses (3.9K likes, 1.0K retweets)

@ZachBoomG: It's a service. It doesn't lose money. It costs money. No one says the military loses \$750b a year (162.3K likes, 42.5K retweets)

*The Economist* frames the USPS as a business, in which monetary losses symbolize failure. Zach counters by reframing the USPS as a service, such as the military; losses don't fit the "service" frame—costs do. Our taxes pay for many vital services, including the military, police, firefighters, clean water, and, on this construal, the USPS. Your beliefs and attitudes toward the USPS might shift depending on which frame is organizing your current mental model (although it doesn't hurt Zach's case that "service" is in the name).

Many framing effects in the experimental literature can be similarly explained as a result of schematic (re)structuring of our mental model for the target issue. For example, in the "Beliefs" section, we described a study showing that relative to framing cancer as a journey framing cancer as a battle increased fatalistic thinking about the disease (D. J. Hauser & Schwarz, 2020). Even though this study used a figurative framing device, the structuring process works the same as the previous examples we discussed. That is, participants used the different semantic frames evoked by the two communicative frames to organize their mental model of

copied with cancer. The "journey" semantic frame includes elements such as *moving down a path toward a destination* and *encountering and overcoming obstacles*. When this frame is evoked in the context of cancer, these elements call up thoughts about the *path* of receiving treatment over time, the *destination* of remission and recovery, and *obstacles* such as pain and nausea.

The "battle" semantic frame, on the other hand, includes elements such as *two opposing groups fighting*, *allies and enemies*, and *winners and losers*. When this frame is evoked in the context of cancer, these elements summon thoughts about *fighting the enemy* cancer cells in the body, the goal of *winning the battle* by *eliminating the threat*, and the all-too-real possibility of *losing the war* by succumbing to the disease. As D. J. Hauser and Schwarz (2020) note: "One way to approach a battle is to yield, give up control, and surrender to the attacker" (p. 1699). They suggest that this element of the battle frame—the notion of *surrender*—was also evoked by the story, leading participants to entertain the idea that people with cancer may *lose the war by surrendering*. Consequently, they expressed a more fatalistic outlook toward the disease.

**Reweighting of issue-relevant beliefs and values.** In some cases, communicative frames do not exert influence by restructuring our mental models. Rather, they work by making issue-relevant beliefs or values evoked by the frame seem more important (Chong & Druckman, 2007; Nelson, Clawson, & Oxley, 1997; Nelson & Oxley, 1999; Nelson, Oxley, & Clawson, 1997). As Nelson, Oxley, and Clawson (1997) explain in an article on the psychology of news framing effects: "Frames tell people how to weight the often conflicting considerations that enter into everyday political deliberations. Frames may supply no new information about an issue, yet their influence on our opinions may be decisive through their effect on the perceived relevance of alternative considerations" (p. 226).

In one experiment that illustrates this mechanism, college students read a news report about a proposed Ku Klux Klan (KKK) rally at their university (Nelson, Clawson, & Oxley, 1997). For half of them, the story was framed as a free-speech issue, with a headline reading "Ku Klux Klan Tests OSU's Commitment to Free Speech," along with a few other sentences that reinforced the frame. For the other half, the story was framed as a public-order issue, with the following headline instead: "Possible Ku Klux Klan Rally Raises Safety Concerns." Participants exposed to the "free-speech" frame expressed greater tolerance for KKK rallies and speeches. Critically, however, this effect was mediated by the importance participants placed on the values of freedom of speech and public order. Those exposed to

the “public-order” frame assigned significantly more weight to this value, which reduced their tolerance for the proposed rally.

Value reweighting helps explain the potency of communicative frames that evoke moral values and other attributes tied to a sense of personal identity. This is the explanation provided by Bryan and colleagues (2011) for why the noun form “being a voter” increased voter turnout compared with the verb form “vote” in the study we discussed in the “Behavior” section. Nouns communicate more stable, essential trait information than verbs do (Gelman & Heyman, 1999; Walton & Banaji, 2004). Because voting is a socially desirable activity in the United States, people may be motivated to see themselves (and be seen) as someone who votes—a *voter*. Exposure to the noun frame in the election survey may have caused people to assign more importance to this self-identity trait, increasing their likelihood of voting in the election. Although this effect has not been consistently replicated (Gerber et al., 2016, 2018, 2023), other studies have shown how communicative frames that invoke moral values relevant to the receiver may be especially effective at shaping attitudes and beliefs (e.g., Bloemraad et al., 2016; Bryan et al., 2013, 2014; Feinberg & Willer, 2013, 2015, 2019; Feygina et al., 2010; Franks & Scherr, 2019; Hurst & Stern, 2020; Kidwell et al., 2013; Nath et al., 2022; Voelkel et al., 2022, 2023; Voelkel & Feinberg, 2018; Wolsko et al., 2016).

For example, one experiment found that conservative Americans expressed increased support for same-sex marriage when it was framed in terms of loyalty to the nation (“same-sex couples are proud and patriotic Americans”), an important conservative value (Feinberg & Willer, 2015). In the same set of studies, liberal Americans expressed increased support for military spending when it was framed in terms of fairness and equality (“through the military, the disadvantaged can achieve equal standing and overcome the challenges of poverty and inequality”), which are important liberal values. Similar effects are evident in various sociopolitical domains, including support for environmental causes (Feinberg & Willer, 2013; Feygina et al., 2010; Hurst & Stern, 2020), immigration (Nath et al., 2022; Voelkel et al., 2022), and political figures (Voelkel et al., 2023; Voelkel & Feinberg, 2018). Aligning the moral values in a communicative frame with the moral values held by the target audience is known as “moral reframing.” Feinberg and Willer (2019) provide a compelling explanation for the potency of this rhetorical strategy, especially in the context of political persuasion:

Because moral convictions are so strongly held, arguments that appeal to them are difficult to

discount, even when used to argue for a position one would typically oppose. As a result, when individuals face a morally reframed argument that resonates with their fundamental moral convictions, they are more likely to evaluate the argument positively and revise their relevant attitudes as a result. (p. 4)<sup>3</sup>

**Priming.** After reading the word “table,” you are quicker to recognize the word “chair” (but not “suitcase”). You are also more likely to answer a question such as “What’s an important piece of furniture?” with “table” or “chair” than with “bookshelf.” This is known as *priming*, in which exposure to one stimulus—in this case, a word—temporarily increases the accessibility and processing of related stimuli. Priming is a well-established, basic cognitive process (Schacter & Buckner, 1998), and it has been used to explain a range of framing effects. For example, a negative/loss frame such as “25% fat” may prime associated negative concepts (e.g., “unhealthy,” “bad”). This would lead you to evaluate a product more negatively than a logically equivalent positive/gain frame such as “75% lean,” which primes more positive concepts (Levin et al., 1998).

Communication scholars have argued that priming helps explain the influence of political and news-media frames (Hoewe, 2020; Roskos-Ewoldsen & Roskos-Ewoldsen, 2009). Stories and messages in the media become more accessible (“primed”) in the minds of the public, which can then impact attitudes. When you are asked how you feel toward a political candidate running for office, any negatively (or positively) framed recent news stories will likely come to mind. Information that is easily accessible in this way is often assumed to be more common or diagnostic (the “availability heuristic”; Tversky & Kahneman, 1973), so priming a negative story may bias your evaluation against the candidate. As a result, what the mass media choose to focus on in their coverage can powerfully shape what the public views as relevant and important (this is known as “agenda setting” in communication studies; Weaver et al., 2004).

That said, priming alone cannot fully explain certain media framing effects (Hendricks et al., 2018; Nelson, Clawson, & Oxley, 1997; Thibodeau & Boroditsky, 2011; Thibodeau, Crow, & Flusberg, 2017). For example, in the KKK rally study described in the previous section (Nelson, Clawson, & Oxley, 1997), participants completed a “lexical-decision” task after reading their assigned news article. They were shown a series of letter strings in a randomized order and had to indicate as quickly as possible whether each string was a real word or not. Some of the real words were associated with free speech (e.g., “liberty”), some were associated

with public order (e.g., “danger”), and the rest were neutral fillers (e.g., “planet”). If participants were primed by reading the message frames, you would expect their reaction times to depend on which frame they received. Specifically, those exposed to the free-speech frame should be faster to respond to the free-speech-related words, and those exposed to the public-order frame should be faster to respond to the public-order-related words. No such pattern was observed. As we described earlier, however, the degree of importance participants placed on free speech and public order did predict their support for the KKK rally, suggesting that value reweighting—and not priming—is the central mechanism for eliciting these effects.

Other studies indicate that priming cannot fully account for the framing effects of metaphors (Hendricks et al., 2018; Thibodeau & Boroditsky, 2011; Thibodeau, Crow, & Flusberg, 2017). For example, in one experiment, participants read a brief report about a city experiencing a surge in violent crime. The first sentence of the article framed crime as either a “beast” or a “virus” that was ravaging the city. Compared with participants in the “virus” condition, those who read that crime was a “beast” were more likely to generate enforcement-related solutions to the crime problem (e.g., build more jails)—conceptually congruent with the “beast” frame. In another version of the study, participants were simply asked to list a synonym for the word “beast” or “virus” before reading a nonmetaphorically framed version of the news report. In this case, there was no difference in the solutions generated across conditions. This suggests that simply being primed with a word is not sufficient to generate a metaphor framing effect. Rather, the word has to be used as a metaphor—a kind of schematic structure—to influence people’s mental model of the target issue.

**Processing fluency.** Some messages feel easier to read and understand than others. Consider how much more arduous it is to trudge through a legal contract than to float through breezy prose in a romance novel. This subjective feeling of how easy or difficult it is to process new information is known as *processing fluency*—a kind of *metacognitive judgment*. Research has shown that people often use fluency as a heuristic in reasoning, favoring information that is easier to process and giving it greater weight in their evaluations (Alter & Oppenheimer, 2006; Bullock et al., 2021; Claypool et al., 2015; Schwarz et al., 2021; Shah & Oppenheimer, 2007; for evidence that the relationship between fluency and reasoning is not so simple, however, see Markowitz & Shulman, 2021; Oppenheimer, 2008). All else being equal, for example, people form more positive impressions of others with names that are easier to pronounce (e.g., Mr. Smith vs.

Mr. Colquhoun; Laham et al., 2012), viewing them as more trustworthy (Silva et al., 2017) and truthful (Newman et al., 2014).

Consequently, several studies have found that processing fluency can increase the persuasive power of a message frame (Bullock et al., 2021; Kidwell et al., 2013; H. J. Kim & Jang, 2018; A. Y. Lee & Aaker, 2004; Mayer & Tormala, 2010; Okuhara et al., 2017). This may be another reason why it is so effective to align the moral values in a communicative frame with the moral values held by the target audience (Feinberg & Willer, 2019). In one study, for example, participants were randomly assigned to view one of two messages aimed at increasing support for a recycling program (Kidwell et al., 2013). One appeal was framed in terms of “individualizing” moral foundations such as fairness and harm reduction, which resonate more with liberal values. The other was framed in terms of “binding” moral foundations such as being part of a group and duty to authority, which resonate more with conservative values. Recycling intentions were higher when the moral values of the message aligned with the moral values of the participant. However, this was mediated by processing fluency: Liberal participants found the “individualizing” message clearer and easier to follow, whereas conservatives felt that way about the “binding” message. Although these results are intriguing, processing fluency is a relatively understudied mechanism in the linguistic framing literature. More research is needed to better understand its role in different types of framing.

### **Social-pragmatic mechanisms**

**Pragmatic inference.** Language comprehension involves “reading between the lines” and interpreting the meaning of words in context. This often requires going beyond the literal meaning of a statement to figure out what the person *really* means. As we read or listen to language, we draw *pragmatic inferences* about the speaker’s or writer’s communicative intentions, assuming that they have chosen their words for good reason—because they are informative and relevant (Christiansen & Chater, 2022; Goodman & Frank, 2016; Grice, 1975; Sperber & Wilson, 1986). For example, imagine you’re out with a friend and you ask about the blind date she went on the night before. She pauses for a moment before replying, “He was nice.” How would you interpret this response? “Nice” is a positive attribute, so you might conclude she liked her date. But if she *really* liked him, wouldn’t she say so more directly? By saying he was “nice”—and *not* saying he was “amazing, charming, and sexy”—your friend might be politely communicating that she found him boring, unattractive, and unworthy of a second date. This example illustrates that our situation models are



based not only on the literal meaning of the words we hear but also on our assumptions about what the speaker intends to communicate.

Evidence suggests that pragmatic inferences contribute to a broad range of framing effects, including several we have introduced already (e.g., Flusberg, Thibodeau, & Holmes, 2022; Flusberg, van der Vord, et al., 2022; Frisch, 1993; Holmes et al., 2022; Kühberger, 1995; Kühberger & Tanner, 2010; Leong et al., 2017; Mandel, 2001, 2014; McKenzie & Nelson, 2003; Rook & Holmes, 2023; Sher & McKenzie, 2006; Wu et al., 2021). For instance, multiple scholars have promoted a pragmatics-based account of the “unusual disease” risky-choice framing effect we described in the “Reasoning, Judgment, and Decision-Making” section (e.g., Frisch, 1993; Gigerenzer, 2018; Kühberger, 1995; Kühberger & Tanner, 2010; Mandel, 2001, 2014; Pinker, 2007). Mandel (2014) hypothesized that people assume communicated quantities are “lower-bounded” estimates rather than precise values unless otherwise stated (for a similar claim, see Pinker, 2007). In other words, when you are presented with the response option “If Program A is adopted, 200 people will be saved,” you’ll tend to interpret it as “*at least* 200 people will be saved” rather than “*exactly* 200 people will be saved.” The same is true for the loss-framed option, “If Program C is adopted, 400 people will die.” Here you would probably interpret it as “*at least* 400 people will die.” Mandel argued that this is why people are more likely to choose Program A than Program C in the two versions of the experiment: C implies more deaths than A, pragmatically speaking. To support this claim, he showed that the framing effect is eliminated if you add the word “exactly” to the language of the response options but not if you add “at least” (for conflicting evidence, however, see Chick et al., 2016; Claus, 2022).

A similar account may explain why subject-complement statements of equality (e.g., “girls do just as well as boys at math”; see “Beliefs” section) lead people to conclude that the group occupying the complement position (“boys”) is superior (Holmes et al., 2022). People tend to infer that the speaker framed this group as the standard or “reference point” to communicate that it truly *is* superior. They then use this insight to update their own beliefs. Consistent with this explanation, a recent set of studies showed that subject-complement statements elicited stronger framing effects for participants who were more sensitive to their pragmatic implications (Holmes, Wu, et al., 2024; Wu et al., 2021).

Finally, the pragmatics of everyday conversation can help explain many framing effects related to how people respond to questions and directions. For example, we noted earlier that people who called an emergency medical hotline provided shorter responses to

directions framed using the present perfect tense (“Tell me what’s happened”) compared with the past tense (“Tell me what happened”; Riou et al., 2017; see “Behavior” section). This may be because the past tense implies that the speaker is interested in hearing about everything leading up to the current situation, whereas the present perfect tense implies an interest in the here and now. Similarly, people in crisis may be less likely to engage with police negotiators who propose that they “talk” rather than “speak” because “talk” implies a more confrontational exchange (Sikveland & Stokoe, 2020; for additional discussion of these cases, see Enfield, 2022). These examples serve as a lesson to researchers on the importance of paying careful attention to the wording of questionnaires and other linguistic measures, which will inevitably be interpreted pragmatically (Schuman & Presser, 1996; Schwarz & Oyserman, 2001; for similar recommendations in the domain of law, see Kellermann, 2007).

***Inferences about the speaker.*** In addition to providing clues about a speaker’s intended meaning, language provides clues about the speaker. People draw many inferences about others based on their choice of words or their “linguistic style,” including judgments of intelligence, group membership, social power, familiarity with the topic, and credibility (Areni & Sparks, 2005; Blankenship & Craig, 2011; Gibbons et al., 1991; Holtgraves & Lasky, 1999; Hosman & Siltanen, 2006). For example, one study found that participants judged a writer to be less intelligent when they used more complex and esoteric language (Oppenheimer, 2006). This effect was mediated by the reduced processing fluency associated with complicated prose.

Our impressions of people can affect how persuasive we find them (Blankenship & Craig, 2011). For example, some people communicate in a seemingly “powerless” style, using more hesitations (“um . . .”), hedges (“I sort of think that . . .”), and tag questions (“Right? You know what I mean?”). People form more negative impressions of powerless speakers and are less persuaded by their messages (Areni & Sparks, 2005; Gibbons et al., 1991; Holtgraves & Lasky, 1999). In contrast, speakers who use many intensifiers (e.g., “really,” “extremely”) are often perceived as more competent and in control (Hosman & Siltanen, 2006), although their persuasiveness can differ as a function of other situational factors (Blankenship & Craig, 2011; Hamilton et al., 1990). Consider former President Donald Trump, known for frequently using intensifiers such as “very” and “tremendously” in his remarks. For those supporters who view him as a credible source of information, this might increase Trump’s persuasive power. For those who view him as untrustworthy and

deceitful, however, such language might reinforce that negative opinion. A study by Hamilton and colleagues (1990) found empirical support for this possibility: Language intensity enhanced the persuasiveness of a message delivered by a high-credibility source but inhibited persuasiveness for a message delivered by a low-credibility source.

We are also quick to form impressions about the social identities of communicators based on subtle linguistic details. Such inferences can lead to framing effects with significant implications for society (e.g., Gaucher et al., 2011; Lammers et al., 2023). For example, one set of studies examined the impact of gender-stereotypical wording in job advertisements (Gaucher et al., 2011). Certain words and phrases are more strongly associated with masculine stereotypes (e.g., determined, strong, competitive, superior), whereas others are more strongly associated with feminine stereotypes (e.g., supportive, committed, sensitive, nurturing). When a job advertisement was constructed to include more masculine than feminine wording, participants inferred that there were more men working in that occupation. As a result, women expressed less interest in the job, and this was mediated by their feeling that they wouldn't belong at the company advertising the position.

### ***Emotional mechanisms***

Aristotle argued that appeals to the emotions (pathos) form a central pillar of rhetoric. This view is echoed in contemporary scholarship on attitudes, reasoning, and persuasion, in which emotion is understood to play a critical role (Dillard & Seo, 2013; Lerner et al., 2015; Nabi, 2002b; Slovic et al., 2007). Feelings and emotions elicited by language infuse our situation models and guide how we respond to a message. Here we consider the role of affective valence and discrete emotional experiences as mechanisms in this process.

***Affective valence.*** We often use our current affective state as a heuristic for decision-making, gravitating toward options that evoke positive feelings and leaning away from options that evoke negative feelings (Slovic et al., 2007).<sup>4</sup> This can help explain a variety of framing effects. For example, several scholars have argued that affective responses play a key role in risky-choice and other types of gain/loss or “valence” framing (De Martino et al., 2006; Druckman & McDermott, 2008; Loewenstein et al., 2001; Nabi et al., 2020; Stark et al., 2017b; Young et al., 2019; but see H. Cheng et al., 2022). One functional neuroimaging study found that risky-choice framing effects were associated with increased activity in “emotional” brain regions such as the amygdala, whereas activity in more

“cognitive” regions such as the prefrontal cortex was associated with reduced framing effects (De Martino et al., 2006). In a recent behavioral experiment, risky-choice framing was mediated by the valence of people's self-reported evaluations of gain- and loss-framed response options (Stark et al., 2017b). Finally, a meta-analysis of 30 years of communication research found that whereas gain frames tend to induce positive emotions, loss frames tend to induce negative emotions, and the presence of these emotions increases the influence of the frames (Nabi et al., 2020).

Language itself is *valenced* as well, as individual words and phrases can evoke positive or negative feelings. This can be considered a form of *emotional* priming and helps explain certain framing effects. In the “Attitudes” section, for example, we discussed how people form more negative attitudes toward immigration when it is framed using negatively valenced group labels such as “illegal aliens” compared with more neutral labels such as “noncitizens” (Rucker et al., 2019). The affective associations of these terms are the principal drivers of people's reactions. This is why emotional language is ubiquitous in political communication. Partisans on both sides of the aisle routinely use words and phrases that elicit positive feelings for positions they favor and negative feelings for positions they oppose. This is reflected in how Republican politicians use the phrase “death tax” to describe a tax on large inheritances because they are averse to taxing wealthy citizens (Lakoff, 2008, 2014; Luntz, 2007).

Even the most subtle differences in valence can shape attitudes. Some words seem neutral on their own but have a tendency to appear alongside mostly positive or negative words in speech and writing. For instance, the word “cause” is often followed by negatively valenced words such as “death,” “problems,” “damage,” and “pain.” The word “produce” is nearly synonymous with “cause,” yet it is more likely to be followed by positively valenced words such as “results,” “effects,” and “goods.” As a result, “cause” is said to have more negative “semantic prosody” than “produce” (D. J. Hauser & Schwarz, 2016). Several studies have shown that semantic prosody can elicit framing effects (for review, see D. J. Hauser & Schwarz, 2023). In one experiment, participants read a sentence about a man and then evaluated him on several traits (D. J. Hauser & Schwarz, 2018). Across conditions, the sentences were identical but for one word that was either positive (“totally”) or negative (“utterly”) in semantic prosody: “As his siblings discovered, Daniel was a[n] *totally* [*utterly*] changed man when he returned.” Those who read the sentence framed with “utterly” rated Daniel as less competent and colder than those who read the sentence framed with “totally.”

**Discrete emotions.** When we communicate about feelings, we typically use discrete emotion labels such as “happy,” “sad,” “guilty,” “scared,” and “angry.” The latter four are all negatively valenced but used to express very different feelings, which may generate different reactions to a message. This may influence the persuasive power of a communicative frame. One meta-analysis found that fear-based appeals reliably affect attitudes and increase behavioral intentions and behaviors because people are motivated to avoid sources of fear described in a message (Tannenbaum et al., 2015). Another meta-analysis found that anger-based appeals have a somewhat inconsistent persuasive influence that depends on many other factors such as argument quality (Walter et al., 2019). These contrasting effects may be related to differences in approach-avoidance motivation associated with fear and anger (Adams et al., 2006; A. J. Elliot et al., 2013). This is one reason scholars have argued that it is necessary to consider the role of discrete emotions in framing, over and above a focus on affective valence (Lerner & Keltner, 2000; Nabi, 1999, 2002a, 2002b, 2010).

Many studies in the communication literature concur, showing that different emotions can generate different reactions to persuasive messages, even when those emotions have the same valence or arousal levels (e.g., Dillard & Nabi, 2006; Lecheler et al., 2013; Nabi, 2002a; Yang & Chu, 2018). In this way, discrete emotions function as cognitive frames—evoked by language—that structure how people conceptualize an issue (Nabi, 2003). Once activated, these emotions shape what information is accessible and guide how people reason about the content of a message. In one experiment, for example, Dutch participants read a news report about economic investments in Bulgaria and Romania after those countries had joined the European Union (Lecheler et al., 2013). The article framed this situation either in a positive way, emphasizing the excitement of Dutch investors, or in a negative way, emphasizing the investors’ outrage. Participants then rated their support for the view that cooperation between the European Union, Bulgaria, and Romania would be profitable. They also rated their feelings of enthusiasm, contentment, fear, and anger in response to this economic agreement. The framing manipulation had the predicted effect, with the positive frame eliciting greater support. However, this effect was mediated by two specific emotions: enthusiasm (but not contentment) and anger (but not fear). This suggests that measuring discrete emotions can provide more nuanced mechanistic accounts than measuring affective valence alone.

### ***Are framing effects irrational?***

In this section, we have described several mechanisms that explain the provenance of common linguistic

framing effects. Before moving on, we make two final points about these mechanisms and raise an important related question.

First, the mechanisms described earlier are not mutually exclusive. A single, seemingly basic framing effect may result from two or more mechanisms operating simultaneously (or separately in different individuals). For example, we have reviewed evidence that pragmatic inference and affective valence both contribute to risky-choice framing, and schematic structuring may play a role as well (see “Equivalency Framing” section). Our broader framework suggests that, as in all forms of human communication, framing arises as people use whatever clues are available to generate a situation model of the topic at hand. That means they will readily integrate semantic, social-pragmatic, and affective information in the course of constructing a mental model of the target issue. From there, they will tend to answer whatever question has been posed to them by drawing on the cognitive and emotional contours of the model.

Second, framing research is deeply connected to other psychological theories of persuasion and cognitive processing. This has implications for how we think about the nature of linguistic framing. In the 20th century, the scientific study of social influence and persuasion emerged as a central topic for researchers in social psychology and communication, coinciding with the rise of mass-media technologies (Cialdini, 2001; Crano & Prislin, 2006; Perloff, 2017; Pratkanis & Aronson, 1991). Like Aristotle, these scholars asked what makes people more or less likely to change their attitudes, beliefs, and behavior in response to messages with persuasive appeal. Much of this work focused on how people process and engage with such information. One highly influential theory of persuasion is the elaboration likelihood model (ELM; Petty & Cacioppo, 1986; for alternative models, however, see, e.g., Chaiken, 1987; Kruglanski & Thompson, 1999). The ELM is a “dual-process” model. This popular characterization of the human mind posits two general modes of cognitive processing: one fast, automatic, and intuitive and the other slow, reflective, and deliberate (J. S. B. Evans, 2008; J. S. B. Evans & Stanovich, 2013; Kahneman, 2011).

According to the ELM, both modes of thinking can lead to persuasion. The “central route” to persuasion engages the rational, reflective mode (think Aristotle’s *logos*). In this case, you would carefully assess the quality of the persuasive appeal, generate and evaluate counterarguments, and otherwise “elaborate” on the content of the message. For example, after reading an article recommending a new vaccine, you might analyze the risks on the basis of medical data and your personal health situation, consult your doctor for a second opinion, and then decide to get vaccinated. The “peripheral route” to persuasion, on the other hand, engages the

intuitive, reflexive mode of thinking (think ethos and pathos). In this mode, you would rely on heuristics, or mental shortcuts, to come to a decision, such as your immediate emotional reaction to the message. For example, maybe you decide to get vaccinated because the tone of the article makes you anxious, or because you trust your experienced doctor who sent it to you. The ELM further specifies who is likely to elaborate on a persuasive message through the central route (hence “elaboration” and “likelihood” in the name of the model)—namely, those who are sufficiently motivated and able to interrogate the persuasive appeal. For example, someone who cares about their health, has mixed feelings about pharmaceutical interventions, has some spare time, and enjoys analyzing scientific data would be especially likely to consciously reflect on the article recommending the new vaccine.

At first glance, all the framing effects we have described—and the mechanisms that explain them—seem to fall under the umbrella of “fast and automatic” processing. That is, most framing manipulations appear to operate via the peripheral route to persuasion. Their effects seem almost subliminal. This is one reason they are so interesting and attention-grabbing, raising the specter of Orwellian social control. Although people *can* engage in deliberate reasoning about, say, the pragmatic implications of a message (“Hmmm, I wonder what she meant by saying her date was ‘nice.’ Maybe she doesn’t really like him . . .”), most of the experiments we have described do not encourage such elaboration. Participants are usually expected to work through a problem quickly, without much reflection, so any impact of a message frame is assumed to be largely automatic. When researchers require people to consciously articulate their reasoning before making a decision, framing effects are often reduced or eliminated (e.g., F. F. Cheng et al., 2014; Hodgkinson et al., 1999; Sieck & Yates, 1997; Takemura, 1994; but see Igou & Bless, 2007; LeBoeuf & Shafir, 2003).

The dominance of peripheral-route explanations in the framing literature raises an important question: Are framing effects *irrational*? Consider that people often respond quite differently when presented with subtly different communicative frames, even when the “logical” content of the frames is identical (e.g., in terms of numbers of lives saved). This has led many researchers to conclude that such effects reveal the irrationality of human judgment, which deviates from idealized models of rational choice (Ariely, 2008; Kahneman, 2011).

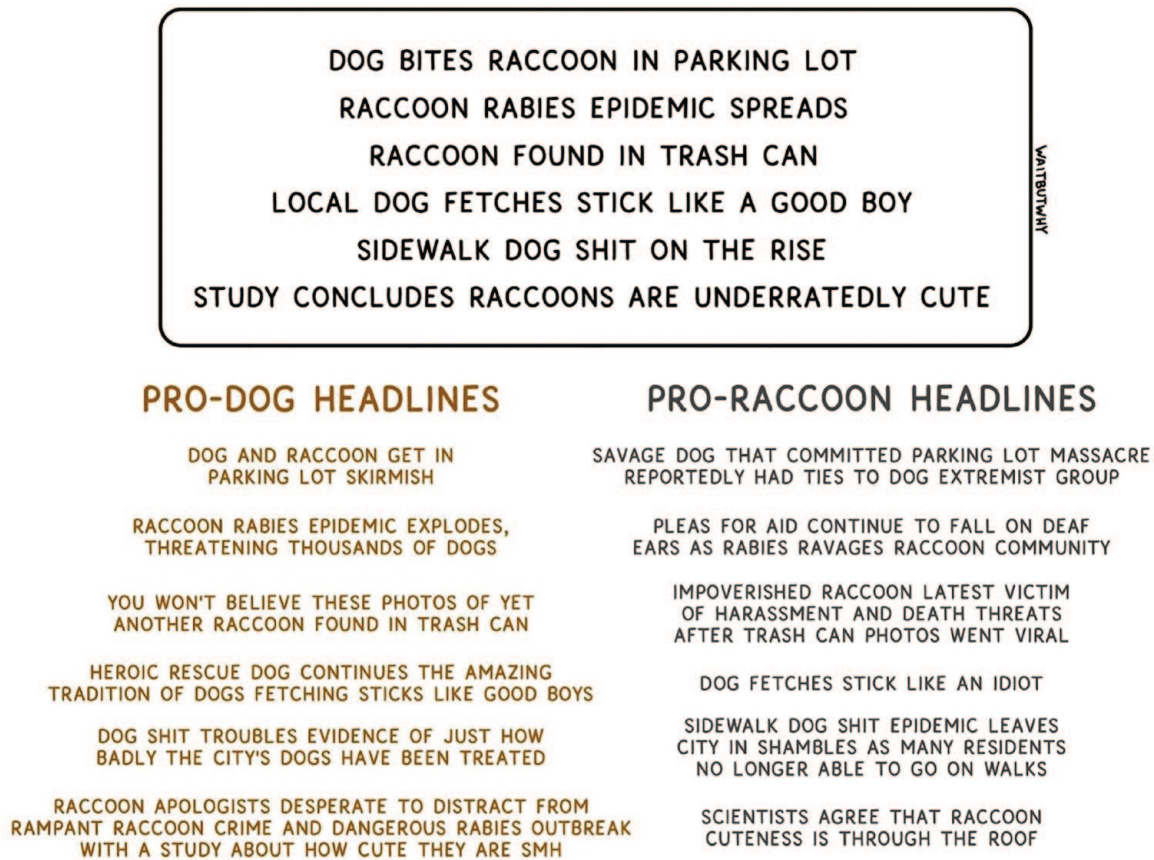
However, we side with critics who have argued that it is rational to respond differently when the same situation is framed differently (Bermúdez, 2020; Flusberg, Thibodeau, & Holmes, 2022; Gigerenzer, 2018; McKenzie & Nelson, 2003; Pinker, 2007; Sher et al., 2022; Sher &

McKenzie, 2006). As our discussion of pragmatics illustrated, the “meaning” of a message goes beyond the surface-level, literal content of a proposition. Even seemingly equivalent message frames can communicate very different—and relevant—information about a target issue. It is perfectly sensible to use such information in the course of your decision-making, even if you are not fully aware of all the ways the message frame has shaped your reasoning. Moreover, and importantly, it is not the case that all framing effects result from automatic or reflexive processing. Sometimes communicative frames are effective precisely because they motivate the audience to process a message more deeply (e.g., Ottati et al., 1999). Ultimately, it is overly simplistic to view framing as a form of subliminal manipulation that exposes irrational flaws in human reasoning. Rather, framing is a complex but natural consequence of the way people communicate.

## A Taxonomy of Framing Devices

So far, we have covered a wide range of effects that result from linguistic framing and multiple mechanisms that underlie these effects. In this section, we turn to the communicative frames themselves: How can we alter the structure or content of a message to induce a framing effect? This question gets at the heart of applying framing to issues in the public interest. We have already introduced many of these framing devices, such as metaphor framing and risky-choice framing, but here we organize these subtypes into a broader taxonomy and highlight some of the prominent findings for each one.

This list is admittedly partial and idiosyncratic because no formal classification system for framing devices currently exists. Researchers interested in framing tend to coin their own terms, only some of which take hold and are picked up by other scholars. Therefore, it is challenging to develop a coherent taxonomy for different types of communicative frames. One popular approach distinguishes between two broad categories of framing: *equivalency framing* and *emphasis framing* (Bullock & Shulman, 2020; Druckman, 2001). Equivalency framing is when the same information is presented in two different forms that are “logically equivalent”—having the same literal meaning (or “truth value,” as philosophers put it). We have considered several kinds of equivalency framing already, including risky-choice framing and attribute framing (e.g., describing beef as 25% fat vs. 75% lean). Framing that uses subject-complement syntax (e.g., “girls are just as skilled as boys” vs. “boys are just as skilled as girls”) is another example. This is a useful category, and we address the many subtypes of equivalency framing in the next section.



**Fig. 1.** A humorous illustration of emphasis framing. The six headlines at the top are reworked to emphasize a pro-dog or pro-raccoon perspective. Any similarities to our current partisan media landscape are likely intentional. Reprinted with permission from Wait But Why (Urban, 2023).

Emphasis framing, on the other hand, is when the communicator emphasizes one logically distinct interpretation over another, deliberately or otherwise. Consider the differences between the pro-dog and pro-raccoon headlines at the bottom of Figure 1, which promote a partisan interpretation of the “neutral” headlines at the top. We have encountered many examples of emphasis framing already, including the use of different metaphors (e.g., “battle” vs. “journey”), labels (e.g., “illegal aliens” vs. “noncitizens”), and values (e.g., “free speech” vs. “public order”). Scholars sometimes delineate different subtypes of emphasis framing in discussions of how politicians and the news media frame important issues. For example, *episodic* frames focus on individual people and events, whereas *thematic* frames zoom out to consider broader historical and contextual factors (Iyengar, 1991; see also our discussion of psychological-distance framing below).

Although useful, the distinction between equivalency and emphasis framing is somewhat limiting. For one thing, it is too broad. There are dozens of framing manipulations discussed in the literature, and lumping them all

into two categories does little to illuminate meaningful differences. In addition, there are types of linguistic framing that do not fit neatly into the equivalency/emphasis binary. Some of the framing effects we have reviewed, such as the difference between “what happened” and “what’s happened,” are so subtle that a social scientist might balk at placing them in the same category as the contrast between “free speech” and “public order.”

Thus, we take a different approach to classifying linguistic framing techniques. We focus on those aspects of linguistic form or content that are manipulated in the frame (for a summary of our taxonomy, see Table 3; for alternative typologies, see Hallahan, 1999; O’Keefe, 2017b). This approach dovetails with our contention that framing should be viewed through the lens of human communication, and it provides a more practical organizational schema for these purposes. Please note, however, that the framing devices we describe below comprise fuzzy categories and subcategories that are not mutually exclusive. For example, equivalency frames and grammatical frames can both evoke different degrees of psychological distance, and some metaphors might be

**Table 3.** Taxonomy of Linguistic Framing Techniques

Type of framing	Definition	Example of framing effect
Equivalency	When information is presented in different forms that are logically equivalent/have the same literal meaning; can involve a contrast between positive/negative frames (valence framing) or more neutral frames (nonvalenced framing); traditionally distinguished from <i>emphasis framing</i> , in which a communicator emphasizes one logically distinct interpretation over another	
Valence		
Risky choice	Describing the response options in an uncertainty-related problem using positive (e.g. “saved”) or negative (e.g., “killed”) language	In response to a scenario describing an outbreak of a new disease expected to kill 600 people, participants were more likely to select a sure (as opposed to risky) health program when it was framed positively (“200 people will be saved”) than when it was framed negatively (“400 people will die”; Tversky & Kahneman, 1981).
Attribute	Describing an object or event in terms of a positive or desirable attribute (e.g., “85% survival rate”) or a negative or undesirable attribute (e.g., “15% mortality rate”)	Participants assigned greater fines to a company whose deceptive advertising practices were described using a negative frame (80% chance they knew the ad was deceptive) than a positive frame (20% chance they did not know the ad was deceptive; Dunegan, 1996).
Goal	Describing the consequences of an action (or inaction) in terms of positive or negative outcomes	College women expressed greater intentions to engage in breast self-examination (BSE) after reading a loss-framed pamphlet (“women who <i>do not</i> do BSE have a <i>decreased</i> chance of finding a tumor . . .”) than after reading a gain-framed pamphlet (“women who <i>do</i> BSE have an <i>increased</i> chance of finding a tumor . . .”; Meyerowitz & Chaiken, 1987).
Comparison	Comparing items in terms of one being “better” than the other (positive frame) versus one being “worse” than the other (negative frame)	Participants rated two items (e.g., sodas) as lower quality when they were exposed to the negative “worse” frame compared with the positive “better” frame. The perceived difference between the items was also larger following the negative frame (Inbar & Evers, 2022).
Nonvalenced		
Subject-complement <sup>a</sup>	Describing an equivalence between groups using subject-complement syntax (e.g., “Xs are just as good as Ys” places Xs in the subject position and Ys in the complement position); also an example of grammatical framing	Participants who read that “Christians are just as likely as Muslims to commit terrorist acts” rated Muslims as more likely to be terrorists compared with when the positions of the groups were reversed (but only if they did not cite this statement as figuring prominently in their evaluations; Holmes et al., 2022).
Unit	Describing a quantitative value using different units; often involves presenting a smaller annuity (e.g., “\$1 per day”) as opposed to a larger aggregate amount (e.g., “\$365 per year”)	Four times as many people enrolled in a savings program when deposits were framed in terms of smaller daily amounts than larger monthly amounts (Hershfield et al., 2020).
Order	Changing the order of a set of items in a list (e.g., “A, B, C” vs. “C, B, A”); the first item often anchors people’s evaluation of the set	When presented with a set of traits about another person, participants who heard a positive trait first endorsed more positive descriptors of the person than those who heard a negative trait first (J. Sullivan, 2019).

(continued)

**Table 3.** (continued)

Type of framing	Definition	Example of framing effect
Figurative	Use of figurative language—including hyperbole, irony, or metaphor—to frame discussion of an issue	
Metaphor <sup>a</sup>	Describing a target issue metaphorically, often in terms of a concrete or experiential source domain; also an example of lexical framing, especially in the case of nominal metaphors (e.g., “Police officers are <i>warriors</i> ” vs. “Police officers are <i>guardians</i> ”)	Participants were more likely to endorse biological causes of addiction and depression when these conditions were framed as infectious “brain diseases” than as “demons” preying on people (Flusberg et al., 2023).
Psychological distance	Describing the same issue at different levels of abstraction that evoke different degrees of <i>psychological distance</i> —the sense of separation between us and what is being described; may be especially effective when there is a match between the abstractness of a message and the psychological distance of the events being described	Participants had more favorable views of a fictional senate candidate when the psychological distance of their campaign matched the level of abstraction in their campaign statement: When the campaign was set to begin in a week, concrete language led to greater favorability; when it was set to begin in 6 months, abstract language led to greater favorability (Kim et al., 2009).
Narrative	Describing an issue using a personal story, often from the perspective of an individual, in contrast to a more abstract, statistical, or facts-based account	Chinese university students expressed greater intentions to get vaccinated against COVID-19 after reading a narrative account of the benefits of vaccination compared with a nonnarrative account (Ye et al., 2021).
Pronoun	Describing a situation using different pronouns that communicate different levels of psychological distance	Participants who used “you” statements to psych themselves up (e.g., “You can do it!”) performed better on a subsequent anagram task than those who used psychologically closer “I” statements (e.g., “I can do it!”; Dolcos & Albarracín, 2014).
Lexical	Describing a situation using different labels or descriptions that have different connotations	Participants evaluated meat more negatively—and consumed less of it—when the animal was described as having been raised on a “factory farm” as opposed to a “humane family farm” (Anderson & Barrett, 2016).
Moral reframing	Describing a situation by invoking moral values relevant to the target audience (especially for issues the audience may not be inclined to support)	Liberals expressed greater support for immigration when an appeal was framed in terms of “compassion” compared with “patriotism,” whereas conservatives showed the opposite pattern (Nath et al., 2022).
Victim	Common rhetorical technique that involves labeling the alleged perpetrator of a crime as the “real” victim in an attempt to mitigate blame and punishment	Participants who read a report about sexual-assault allegations that framed the alleged assailant as a victim (of false accusations) expressed more support for him and less support for his accuser compared with a report that framed the accuser or neither character as the victim (Flusberg, van der Vord, et al., 2022).
Grammatical	Describing a situation by manipulating the grammatical form or structure of a message rather than the content	
Agentive	Describing an action by including the causal agent (“Carlos opened the umbrella”; agentive frame) or omitting the causal agent (“the umbrella opened”; nonagentive frame)	Participants attributed more blame and financial liability to a person who accidentally started a fire at a restaurant when the report was framed agentively (“she flopped the napkin. . .”) than nonagentively (“the napkin flopped. . .”; Fausey & Boroditsky, 2010).

(continued)

**Table 3.** (continued)

Type of framing	Definition	Example of framing effect
Aspectual	Using grammatical markers to emphasize either the completion of an event (“swerved”; perfective aspect) or the ongoing nature of the event (“was swerving”; imperfective aspect); imperfective aspect seems to elicit a more dynamic situation model	Participants evaluated a political candidate more negatively when prior negative actions were framed imperfectively (“was having an affair”) than perfectly (“had an affair”); Fausey & Matlock, 2011).
Generic	Describing an attribute using generic language (e.g. “Dogs are great swimmers”), which promotes more essentialist reasoning than nongeneric language (e.g., “That dog is a great swimmer”)	Generic statements about Democrats or Republicans (e.g., “Democrats support House Bill 858”) compared with quantified statements (e.g., “Many Democrats support House Bill 858”) led participants to infer that the two parties held more polarized views (Novoa et al., 2023).
Dynamic norm <sup>a</sup>	Describing normative behavior in terms of change over time as opposed to more stable information; often involves both grammatical and lexical changes to a message	Participants were more willing to reduce meat consumption when presented with a dynamic norm message (“in the last 5 years, 30% of Americans have now started to make an effort to limit their meat consumption. . .”) than a static norm message (“30% of Americans make an effort to limit their meat consumption. . .”); Sparkman & Walton, 2017).

Note: This list is not exhaustive, and the categories that are provided are fuzzy. <sup>a</sup>May belong in multiple categories.

classified as lexical frames. This list is therefore not meant to be exhaustive or final; there are likely many variants of linguistic framing that we have inadvertently left out. We encourage you to read on with these caveats in mind.

### ***Equivalency framing***

***Valence framing.*** As we discussed, equivalency framing involves presenting people with seemingly equivalent information in different ways. This often entails contrasting a positive (“gain”) frame and a negative (“loss”) frame, leading some scholars to prefer the term *valence framing*. Levin and colleagues (1998) distinguished between three types of valence framing based on differences in what is framed, what is affected, and how this is measured.

*Risky-choice framing* should be familiar by now. Here, response options in a problem-solving task with different levels of associated risk or uncertainty are framed in terms of gains or losses. This influences risk preferences and decision-making, as indexed by which option participants select to solve the problem. This type of valence framing originated with Tversky and Kahneman’s (1981) unusual disease study, and has been a major topic of interest ever since, especially in psychology and behavioral economics.

*Attribute framing* is when an object or situation is framed in terms of a positive or desirable attribute (e.g.,

“75% lean” or “85% survival rate”) or a negative or undesirable attribute (e.g., “25% fat” or “15% mortality rate”). Attribute framing affects the evaluation of a target item as indexed by some measure of attitudes (e.g., product ratings) or behavior (e.g., willingness to purchase a product). In general, people show more favorable attitudes toward items and situations that are framed positively.

*Goal framing* is when the consequences of an action (or inaction) are framed in terms of positive or negative outcomes. This type of framing is often used to influence people’s behavior or behavioral intentions in a positive way—one reason it is prevalent in health and environmental communication. It is slightly more complicated than other forms of valence framing, however. A gain frame might describe how engaging in the action will lead to a desirable outcome (“if you use sunscreen, you will be protected from the sun’s harmful rays”) or help you avoid an undesirable outcome (“if you use sunscreen, you will lower your risk of getting cancer”). Similarly, a loss frame might describe how *not* doing the action will lead you to miss out on the desirable outcome (“if you don’t use sunscreen, you won’t be protected from the sun’s harmful rays”) or experience the undesirable outcome (“if you don’t use sunscreen, you will increase your risk of getting cancer”). This differs from risky-choice and attribute framing because the target action is framed as something “good” in all circumstances.



In a seminal study of goal framing, college women were presented with a short pamphlet on breast self-examination (BSE) that included either the following underlined (gain frame) or bracketed (loss frame) information (Meyerowitz & Chaiken, 1987):

By doing [not doing] BSE now, you can [will not] learn what your normal, healthy breasts feel like so that you will be better prepared [ill prepared] to notice any small, abnormal changes that might occur as you get older. Research shows that women who do [do not do] BSE have an increased [a decreased] chance of finding a tumor in the early, more treatable stage of the disease. . . . You can gain [lose] several potential health benefits by spending [failing to spend] only 5 minutes each month doing BSE. Take [Don't fail to take] advantage of this opportunity.

The results revealed that the loss frame was more impactful, as women in this condition reported greater intentions to engage in BSE than women who received the gain-framed pamphlet. A 4-month follow-up showed that the loss-frame participants had followed through on their intentions, performing BSE more often than the other participants in the intervening months. However, loss frames are not necessarily more impactful than gain frames in studies involving other kinds of target actions (O'Keefe & Jensen, 2007, 2009, 2015; O'Keefe & Wu, 2012).

A fourth type of valence framing, *comparison framing*, was recently investigated by Inbar and Evers (2022). When comparing two items (e.g., two toasters, teams, or sodas), you can describe Item A as *better* than Item B or Item B as *worse* than Item A. Across multiple studies, participants rated both items lower in quality when they had been exposed to the negative “worse” frame compared with the positive “better” frame. The perceived difference between A and B was also larger following the negative frame. Inbar and Evers suggest that this is because of linguistic “markedness.” For any pair of antonyms, one word will be more dominant or “unmarked” (e.g., “better,” “longer,” “heavier”), whereas the other will be less dominant or “marked” (e.g., “worse,” “shorter,” “lighter”). Unmarked terms are generally easier to process and remember, and they communicate a more neutral position on the underlying scale. Marked terms, on the other hand, require more effort to understand, and they communicate a specific anchoring on one end of the scale (often the negative end; see also Clark, 1969; Harris, 1973; Lipscomb, Bregman, & McAllister, 1985; Lipscomb, McAllister, & Bregman, 1985).

The results of several meta-analyses suggest that valence framing reliably yields moderately sized effects

(Freling et al., 2014; McDonald et al., 2021; Piñon & Gambará, 2005; Steiger & Kühberger, 2018). However, there are differences across different subtypes of valence framing. One recent meta-analysis in the domain of moral reasoning found an overall medium-sized effect (Cohen's  $d = 0.50$ ;  $d = 0.22$  when correcting for publication bias; McDonald et al., 2021). An analysis of studies published between 1997 and 2003 found reliable, moderate-to-medium effect sizes for risky-choice framing ( $d = 0.44$ ), attribute framing ( $d = 0.26$ ), and goal framing ( $d = 0.44$ ; Piñon & Gambará, 2005). Recent meta-analyses have found similar effect sizes for risky-choice framing ( $d = 0.52$ ; Steiger & Kühberger, 2018) and attribute framing (Pearson's  $r = .25$  for attitude outcome measures and  $r = .21$  for behavioral outcome measures; Freling et al., 2014).

However, several meta-analyses by O'Keefe and colleagues suggest that the impact of goal framing in health communication is smaller and less consistent (O'Keefe & Jensen, 2006, 2007, 2009, 2015; O'Keefe & Wu, 2012). This is not surprising. Goal framing often targets people's real-world health behaviors, which are complicated and influenced by many other factors. For messages encouraging disease *detection* behaviors, loss-framed appeals were found to be more persuasive than gain-framed appeals (O'Keefe & Jensen, 2009). This effect was very small overall ( $r = -.04$ ), and only statistically significant for breast cancer detection behaviors ( $r = -.06$ ). Loss framing had no measurable impact on detection behaviors for other conditions such as skin cancer or dental problems. For messages encouraging disease *prevention* behaviors, however, gain-framed appeals were slightly more persuasive than loss-framed appeals (O'Keefe & Jensen, 2007). Again, this effect was small ( $r = .03$ ) and driven entirely by messages encouraging dental hygiene ( $r = .15$ ). Other meta-analyses support this slight gain-frame advantage for promoting prevention behaviors (e.g., Gallagher & Updegraff, 2012). For example, gain-framed appeals were more effective than loss-framed appeals for encouraging physical activity to address obesity ( $r = .17$ ; O'Keefe & Jensen, 2015). However, goal framing appears to have no impact on healthy eating (O'Keefe & Jensen, 2015) or skin-cancer prevention behaviors (O'Keefe & Wu, 2012).

As we discussed in the “Mechanics of Communication and Linguistic Framing” section, multiple mechanisms contribute to valence framing effects, including pragmatic inferences and emotional reactions associated with the message frames (De Martino et al., 2006; Inbar & Evers, 2022; Leong et al., 2017; Mandel, 2014; Nabi et al., 2020; Stark et al., 2017; see also Kreiner & Gamliel, 2018). Researchers have also devoted considerable attention to the cognitive mechanisms that underlie

risky-choice framing, although a full treatment of the various models is beyond the scope of this article (for a recent attempt to compare formal models, see Huizenga et al., 2023). Much of this work describes the mental representations people construct in response to different frames and the internal (unconscious) calculations they run before making a choice.

**Nonvalenced equivalency framing.** There are several other types of equivalency framing effects that do not involve contrasting explicitly positively versus negatively valenced message frames.

*Subject-complement framing* is when this particular grammatical construction is used to express that two groups are equivalent on some trait, as we have discussed previously (e.g., “girls are just as skilled as boys”; see “Beliefs” section; Chestnut & Markman, 2018; Holmes et al., 2022). People tend to surmise that the group in the complement position is superior, setting the standard for the group in the subject position. This judgment appears to be driven by the pragmatic implications of the syntactic construction (Holmes, Wu, et al., 2024; Wu et al., 2021). In comparative statements more generally, the group framed as the standard (e.g., “dogs” in “cats use different hunting methods than dogs”) is viewed as having more agency and power than the other group (Bruckmüller & Abele, 2010; Bruckmüller et al., 2012).

*Unit framing*—a term we just coined—refers to the act of describing a quantitative value using different units. This typically involves presenting a smaller annuity as opposed to a larger aggregate amount. For example, an animal shelter might advertise that you can save a sick puppy for 35¢ per day rather than \$127.75 per year, a “pennies-a-day” strategy that Gourville (1998) called “temporal reframing.” This can impact people’s decision-making and behavior, which is why it is favored by marketers. For example, a recent field study found that four times as many people used a new finance app to enroll in a savings program when deposits were framed in terms of smaller daily amounts than larger monthly amounts (Hershfield et al., 2020). People struggle to construct quantitatively precise mental models on the fly, so the smaller daily amount may simply *feel* less costly. This effect depends on the amount of money we’re talking about, however. Another study examined the extent to which people perceive that a certain amount of wealth is adequate for retirement (Goldstein et al., 2016). At lower amounts (e.g., \$100,000), a lump sum was rated as more adequate than a comparable monthly annuity, but at higher amounts (e.g., \$2,000,000) this effect was reversed. More research is needed on this type of framing to assess the reliability of this technique and fully unpack all of the underlying mechanisms at play.

*Order framing* concerns how the order in which a set of items is presented can shape the way people respond (e.g., Mantonakis et al., 2009; J. Sullivan, 2019). For example, in a classic study on impression formation, Solomon Asch (1946) discovered a primacy effect: Participants tended to form a more favorable impression of someone described as “compassionate, stubborn, and envious” than “envious, stubborn, and compassionate.” A recent large-scale replication of this work found that hearing a positive trait first leads people to endorse about 7% more positive descriptors of a person than hearing a negative trait first (J. Sullivan, 2019). Interestingly, this effect does not seem to be explained by the pragmatic inference that the most informative trait was *intentionally* mentioned first: Participants still showed a primacy effect when they were told that a computer randomly put the list of traits together. This suggests that schematic structuring may be the main contributing factor, with the first trait scaffolding the situation model of the person being described. Pollsters and survey makers are well aware of order framing because it affects how questions and response options are worded and organized (Kellermann, 2007; Schuman & Presser, 1996).

### **Figurative framing**

People often express themselves figuratively rather than literally. This includes using hyperbole (“Everyone knows this is the worst policy in American history”), irony (“Yeah, this policy is amazing, sure”), and metaphor (“This policy is toxic trash”). Many scholars have explored the framing effects of figurative language, asking when, how, and why it affects reasoning and persuasion (e.g., Boeynaems et al., 2021; Brugman et al., 2019; Burgers et al., 2016, 2018; Flusberg et al., 2018; Lakoff, 1996, 2008, 2014; Lakoff & Johnson, 1980; Sopory & Dillard, 2002; Thibodeau et al., 2019). Most of the related empirical research has focused on *metaphor framing* (but see Boeynaems et al., 2021; Burgers et al., 2015, 2016, 2018).

Metaphors play an essential role in language and thought and are pervasive in everyday conversations, written texts, and public discourse (Gibbs, 2017; Holmes et al., 2018; Lakoff & Johnson, 1980; Thibodeau et al., 2019; Thibodeau, Hendricks, & Boroditsky, 2017). Metaphors enable us to communicate about complex, abstract, and unfamiliar “target domains” (e.g., a new governmental policy, cancer) by borrowing language from a more familiar or concrete “source domain” (e.g., trash, battles and journeys). Many studies have demonstrated the effects of metaphor framing on attitudes, beliefs, and reasoning about everything from crime and law enforcement (Christmann & Göhring, 2016; Thibodeau & Boroditsky, 2011, 2013; Thibodeau, Crow, & Flusberg,

2017), to climate change and genius ideas (Elmore & Luna-Lucero, 2017; Flusberg et al., 2017; Flusberg & Thibodeau, 2023), to immigration and the federal budget (Brown et al., 2019; Thibodeau & Flusberg, 2017), to cancer and mental illness (Flusberg et al., 2023; D. J. Hauser & Schwarz, 2020; Hendricks et al., 2018; Magaña & Matlock, 2018; Schroder et al., 2023). We have discussed some of these examples already.

Several meta-analyses indicate that metaphors are (slightly) more persuasive than comparable literal language. For example, Sopory and Dillard (2002) found a small but significant overall effect size across a range of studies of metaphor framing ( $r = .07$ ). This effect was substantially larger in studies that used a single, novel metaphor that appeared early in a message to describe a familiar target domain ( $r = .42$ ). A more recent meta-analysis of studies conducted between 2001 and 2015 found a similarly small but reliable metaphor framing effect ( $r = .09$ ; Van Stee, 2018). A third meta-analysis on metaphor framing in the context of political discourse also found a small but reliable overall effect ( $d = 0.11$ ; Brugman et al., 2019). This effect was larger for measures of belief ( $d = 0.29$ ) than attitudes ( $d = 0.10$ ).

Whereas many studies contrast metaphorically versus nonmetaphorically framed messages, other studies compare the effects of different metaphors in discussions of a single target issue (e.g., cancer as a “battle” vs. “journey,” crime as a “beast” vs. “virus,” politics as “war” vs. “theater,” mental illness as “an infectious disease” vs. “a demon”). Together, this research has provided valuable insights into the cognitive, pragmatic, and emotional mechanisms that drive metaphor framing effects (Lakoff, 2008, 2014; Thibodeau & Flusberg, 2022; Thibodeau, Hendricks, & Boroditsky, 2017; Thibodeau et al., 2019). As discussed in the “Schematic Structuring” section, metaphors encourage people to map their schematic knowledge of the source domain (e.g., battles) onto the target domain (e.g., cancer). This provides an organizational structure—a semantic or cognitive frame—for what might otherwise be a vague or ambiguous mental model. By leveraging knowledge of the source domain to construct an understanding of the target domain, metaphors are especially useful for guiding reasoning about complex, abstract issues such as cancer, crime, and climate change, which do not evoke well-delineated cognitive frames on their own. Thus, metaphors are most effective when (a) they involve source domains that are familiar, accessible, and have a well-defined schematic structure and (b) the source domain structure can be clearly mapped onto the target domain (i.e., the metaphor is “apt”; Thibodeau, Hendricks, & Boroditsky, 2017; Thibodeau et al., 2019).

Several other findings support the idea that metaphors stimulate schematic (re)structuring. First, as we

mentioned earlier, metaphors tend to be more effective when they appear early in a message (Sopory & Dillard, 2002; Thibodeau & Boroditsky, 2011). That way, they can scaffold how people interpret and integrate the rest of the message into their situation model. If a metaphor appears toward the end of a message, people may have already formed an opinion on the target issue, and there may be little opportunity for the metaphor to structure their thinking.

Second, metaphors are more impactful when they are extended throughout a message and into the response options in a decision-making scenario (Flusberg et al., 2020; Keefer et al., 2014; Thibodeau et al., 2016). Extended metaphors reinforce the structure of a situation model and help people map the metaphor’s “entailments”—the inferences licensed by the metaphor—onto their choices in the task. For example, we asked earlier whether it would make any difference to describe political polarization using “war” versus “theater” metaphors. Studies suggest that the answer is “yes,” and that extending the metaphor enhances the effect (Flusberg et al., 2020; Thibodeau et al., 2016). This example comes from an extension of the study discussed in the “Reasoning, Judgment, and Decision-Making” section in which participants responded to multiple metaphorically framed reasoning problems (Thibodeau et al., 2016). In the follow-up study (Flusberg et al., 2020), participants completed four different metaphor framing trials, including one that described legislative stagnation using either a theater or war metaphor:

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.

Participants were then asked: “Which of the following do you think would be more likely to change the culture in Washington?” They had to select between two response options, each conceptually congruent with one of the metaphors. In the first version of the experiment, the response options extended the metaphor from the vignette: (a) “Close the curtain on the saga by ending the 24-hour media coverage of politicians” (congruent with theater) or (b) “Bring a truce to the war by forcing politicians to acknowledge their common obligations” (congruent with battle).

In the second version of the experiment, the response options did not extend the metaphor, although they were still conceptually congruent with each metaphor

according to a norming study (Thibodeau, 2016): (a) “End the 24-hour media coverage of politicians” (congruent with theater) or (b) “Force politicians to acknowledge their common obligations” (congruent with battle).

In both experiments, participants selected the metaphor-congruent response option at above-chance levels. However, this metaphor framing effect was significantly larger when the metaphor was extended (13.4% advantage for the metaphor-congruent option) than when it was not (7.8% advantage).

The emotional and pragmatic effects of metaphor are also important. The emotional dimension has received limited attention (Holyoak & Stamenković, 2018), but research suggests metaphors tend to be more emotionally engaging than comparable literal language (Citron & Goldberg, 2014; Mon et al., 2021). It is these affective associations that drive the effects of some metaphors (e.g., war metaphors promote a sense of urgency; Flusberg et al., 2017, 2018). But emotionally charged metaphors can also backfire. One study found that a far-right, anti-immigration message framed using violent and dehumanizing metaphors (e.g., “a *plague* of immigrants *swarming* into the country”) increased *pro*-immigration attitudes (Hart, 2021).

Metaphors can also influence persuasion more indirectly by impacting speaker judgments, although here the evidence is mixed (Ottati & Renstrom, 2010; S. J. Read et al., 1990). For example, Ottati and Renstrom (2010) reviewed some studies suggesting that metaphors enhance persuasion by eliciting more positive speaker impressions, perhaps because metaphor use is interpreted as a sign of intelligence. Yet they also reviewed other studies suggesting that metaphors sometimes make the speaker seem less credible. They conclude that certain properties of the metaphor may moderate these effects, such as the relevance or aptness of the metaphor in context. Additional research is needed to tease apart the pragmatic functions of metaphors in framing.

### ***Psychological distance framing***

The same event, issue, or action can be framed at different levels of abstraction. For example, you can talk about a pandemic at a high level of abstraction (a “thematic” frame) by discussing policies and statistics, such as the number of people getting ill each day or the financial losses associated with a lockdown. Alternatively, you can frame a pandemic in very concrete terms by using a personal narrative (an “episodic” frame), describing the experiences of a single individual who became sick or lost their job. Abstraction is associated with psychological distance—the sense of separation in time, space, or experience between us and

whatever it is we are considering at the moment (Liberman et al., 2007). More abstract “construals” feel more psychologically distant, whereas more concrete construals feel psychologically closer and evoke more of an emotional response. This has downstream consequences for reasoning and decision-making (S. J. Lee, 2019; Trope & Liberman, 2012).

For example, people may feel more comfortable and motivated to engage with an issue that is framed more concretely, and thus psychologically closer. In one study, graduate-level business students indicated their willingness to invest in a new company that was about to go public (W. B. Elliott et al., 2015). Participants were more willing to invest when the prospectus they read highlighted concrete (as opposed to abstract) information about the company. On the other hand, abstract language may be effective for communicating with a larger and more diverse audience, where people may vary in their concrete circumstances but share abstract ideals (Joshi & Wakslak, 2014). This is one reason why political slogans are often pitched at a high level of abstraction (“Make America Great Again,” “Yes We Can”).

Some research suggests that messages are especially effective when there is a match between the abstractness of the message and the psychological distance of the events being described. In one experiment, participants read a statement from a fictional candidate running for the U.S. Senate (H. Kim et al., 2009). The statement was framed at either an abstract level (“a refocus on *why* we do things”) or a more concrete level (“a refocus on *how* we do things”). The researchers further manipulated whether the campaign was set to begin next week (psychologically close) or in 6 months (psychologically distant). Participants had more favorable views of the candidate when the psychological distance and level of abstraction matched: When the campaign was set to begin in a week, concrete language led to greater favorability, but when it was set to begin in 6 months, abstract language led to greater favorability.

Several specific framing techniques involve manipulating psychological distance:

*Narrative framing* describes the use of concrete stories about individual characters and their motivations. Evidence suggests that narratives are (slightly) more persuasive than other messages about the same issue. One meta-analysis found that narrative messages significantly predicted narrative-consistent beliefs ( $r = .17$ ), attitudes ( $r = .19$ ), intentions ( $r = .17$ ), and behaviors ( $r = .23$ ; Braddock & Dillard, 2016; see also Oschatz & Marker, 2020). A meta-analysis of the health-communication literature found that narratives were more persuasive than nonnarratives overall ( $r = .06$ ; Shen et al., 2015; see also De Graaf et al., 2016; Xu, 2023). This was only statistically significant for messages

advocating disease detection and prevention behaviors, however, and not for messages advocating cessation behaviors.

Narratives are effective for several reasons (for review, see Walsh et al., 2022). For one, they are more emotionally engaging than nonnarratives, and they help people connect with the experiences of others (Alam & So, 2020; Nabi & Green, 2015). As a result, narratives can reduce audience resistance to a message (Moyer-Gusé & Nabi, 2010; Ratcliff & Sun, 2020). A sense of psychological closeness to the central characters is important in narrative framing. Health narratives have been found to be more effective when delivered from a first-person point of view than from a third-person point of view, especially when the protagonist is depicted as similar to the audience (M. Chen & Bell, 2022; De Graaf et al., 2016). Relatedly, narratives can reduce stigma toward different social groups, especially when they are delivered from the first-person perspective (Zhuang & Guidry, 2022). Finally, narratives are generally easier to understand and processed more fluently than nonnarratives, which has been shown to increase their persuasive power (Bullock et al., 2021).

However, narratives are not always more effective than nonnarratives. As we mentioned before, message frames are often most persuasive when the level of psychological distance they evoke matches the target issue. One recent meta-analysis compared the persuasive effects of anecdotal versus statistical information in different communicative contexts (Freling et al., 2020). Concrete personal anecdotes were generally found to be more persuasive than abstract statistics in situations involving high emotional engagement (Hedges's  $g = -0.06$ ). This includes health issues and other personally-relevant threats, which are psychologically close. On the other hand, statistical information was found to be more persuasive in situations involving low emotional engagement, like non-health issues affecting other people, which are more psychologically distant ( $g = -0.16$ ). Another meta-analysis found that in health communication, narratives have a greater impact than statistics on behavioral intentions ( $d = 0.10$ ), but statistics have a greater impact on beliefs ( $d = -0.16$ ) and attitudes ( $d = -0.11$ ; Zebregs et al., 2015).

*Pronoun framing* is when we use words such as “I,” “we,” and “you” to communicate psychological distance in the social domain (Nook et al., 2017; Orvell et al., 2022). Unlike the first-person singular “I,” the plural “we” and second-person “you” signal that the speaker’s perspective extends beyond the self. Research has shown that subtle differences in the use of these pronouns can affect how interpersonal relationships are evaluated. In one study, for example, participants read a description of a friendship that used either “Valerie

and I” or “we” to refer to the two friends (Fitzsimons & Kay, 2004). The friendship was perceived as closer and higher quality—and the friends as forming a more coherent unit—when described with “we.” A similar effect was observed when participants were asked to vary their pronoun use while reflecting on their own friendships.

The pronoun “you” may be especially effective as a framing device for making sense of the social world. Although most often used when addressing a specific individual (“How are you doing?”), “you” can also be used to reframe personal challenges as shared, universal experiences (“You have to recognize you can’t change people”; Orvell et al., 2017). This use of “you”—known as *generic-you*—seems to foster a sense of connection with the ideas expressed. For example, in one study, participants indicated that generic-you statements resonated more strongly with them than otherwise identical “I” statements (e.g., “Sometimes, [you/I] have to take a step back before [you/I] can take a step forward”; Orvell et al., 2020). People may regard such statements as insightful because they perceive the speaker as expressing a healthy degree of psychological distance from the events that inspired them (Orvell et al., 2017).

Another function of “you” is to address ourselves from an outsider’s perspective. For example, right before you deliver a big presentation, you might say to yourself: “You can do this!” Unlike most of the examples of framing we have reviewed so far, this use of “you” is intended to regulate our own thoughts and feelings rather than influence others (cf. Bermúdez, 2020). Several studies have shown that using “you” statements of this sort in the midst of a stressful situation increases psychological distance, reducing negative emotions and enhancing task performance (Dolcos & Albarracín, 2014; Kross et al., 2014, 2017). Other linguistic shifts in response to aversive stimuli (e.g., avoiding present-tense verbs, using longer words) also support effective emotion regulation (Holmes, Kassin, et al., 2024; Kassin et al., 2023; Nook et al., 2017, 2020). Like “you,” these words may help us process stressful situations by framing them (to ourselves) from a more abstract, distanced perspective.

### ***Lexical framing***

One of the most basic framing techniques involves manipulating the label or description applied to an issue, individual, or group. This is known as *lexical framing*. For example, one set of studies found that people spend more and save less when an unanticipated financial windfall is labeled a “bonus” than when it’s labeled a “rebate” (Epley et al., 2006). The “bonus”

frame leads people to conceptualize the money as something extra, over and above their normal income. This licenses freer spending habits because it is not included in their mental model of their budget. The “rebate” frame, on the other hand, leads people to conceptualize the money as something that was already theirs and is only now being returned to them. As a result, they see the money as part of their normal budget, which likely includes limits on spending.

We have seen many other examples of lexical framing throughout this article, including the contrast between different labels for people who enter the United States without authorization (Rucker et al., 2019), as well as work that emphasizes different values in a persuasive message or news report (e.g., free speech vs. public order; Nelson, Clawson, & Oxley, 1997; for a review of the literature on *moral reframing*, see Feinberg & Willer, 2019). This reflects the prominence of lexical framing in politics, in which groups with competing interests work to influence public sentiment by labeling and relabeling programs, policies, and political opponents (for an extended discussion of this issue from the perspective of a political pollster, see Luntz, 2007; see also Lakoff, 2008, 2014).

Sometimes, lexical framing involves selectively applying a single label to one person or situation versus another. For example, one series of studies investigated *victim framing*, a common rhetorical technique that casts the alleged perpetrator of a crime as the “real” victim in an attempt to mitigate blame and punishment (Flusberg, van der Vord, et al., 2022). Participants read a brief news report about an alleged sexual assault on a college campus. The report framed either the female accuser as a victim (of sexual assault) or the male alleged assailant as a victim (of false allegations). Relative to a baseline condition in which no one was framed as a victim, participants generally expressed more support for the victim-framed character and less support for the other character. A key mechanism driving this effect is pragmatic inference. Only those participants who explicitly cited the victim-related language in the report as influencing their evaluations showed significant framing effects. This suggests that participants inferred the victim label was chosen for a reason—to indicate which character was deserving of support.

By their nature, lexical framing effects are incredibly diverse. The linguistic properties of generativity and displacement we discussed in the “Making Sense of Language” section mean that common words and phrases can express a virtually limitless array of meanings, and researchers have only scratched the surface of their potential effects. Thus, we view lexical framing as a loose category that encompasses a wide variety of

heterogeneous, context-specific effects. The same is true of grammatical framing, which we discuss next.

### ***Grammatical framing***

Some of the subtlest framing effects result from manipulating grammatical form, including sentence structure, and grammatical category, such as tense and aspect. Grammatical features are often chosen without any awareness of the implications they carry. For example, someone might attempt to combat Islamophobia by saying “Christians are just as likely as Muslims to commit terrorist acts,” not realizing that this statement tacitly reinforces anti-Muslim stereotypes by placing Muslims in the complement position—implying they are *more* likely to commit terrorist acts (Holmes et al., 2022). In addition to such subject-complement statements (which are also a form of equivalency framing; see “Nonvalenced Equivalency Framing” section), we have already reviewed several other examples of *grammatical framing*, including messages that imply different levels of speaker interest by varying tense (“Tell me what happened” vs. “Tell me what’s happened”; Riou et al., 2017) and different personal values by varying whether actions are described using nouns or verbs (“be a voter” vs. “vote”; Bryan et al., 2011, 2013, 2014).

Many other grammatical contrasts are known to influence how people reason about everyday events and situations. Suppose you witness a traffic accident in which a car swerves off the road and crashes into a fence. Later, when recounting what you saw, you might use an “agentive” expression such as “The driver crashed the car.” Alternatively, you could omit the causal agent by saying “The car crashed”—a construction that seems evasive in English but is commonly used to describe accidents in other languages (Fausey & Boroditsky, 2011). Changes in *agentive framing* can affect how people construe what happened. In one study, participants attributed more blame and financial liability to the agent of an accidental event after reading an agentive description (e.g., “she toppled the candle”) than a comparable nonagentive description (e.g., “the candle toppled”; Fausey & Boroditsky, 2010). This may be because the agent figured more prominently in the situation model triggered by the agentive description, shaping subsequent memory and reasoning (Fausey & Boroditsky, 2011).

In your description of the car accident you saw, you might say “The car swerved” or “The car was swerving.” These statements differ in *aspectual framing*. One emphasizes the completion of the event (“swerved”; perfective aspect), whereas the other emphasizes its ongoing nature (“was swerving”; imperfective aspect). Research suggests that your choice of aspectual frame

will impact how others conceptualize the accident. In descriptions of motion events, imperfective aspect tends to elicit a more dynamic situation model—with motion that is more extensive, vivid, and, in the case of accidents, reckless—than perfective aspect (Huettenlocher et al., 2014; Matlock, 2011; Matlock et al., 2012). Aspectual framing can even shape the interpretation of political messages. In one study, participants were less confident that a senator would be reelected after reading that he “was taking hush money”—implying that the misdeed was long-lasting—than that he “took hush money” (Fausey & Matlock, 2011).

The effects of aspectual framing dovetail with recent work on *dynamic norm framing*, in which people are presented with information about how normative behavior is changing over time (Loschelder et al., 2019; Sparkman & Walton, 2017, 2019). This type of framing has been found to be more persuasive than comparable “static norm” information (but for evidence it can backfire, see Boenke et al., 2022). In one study, for example, some participants were presented with the following message about meat consumption that emphasized a stable demographic norm (Sparkman & Walton, 2017): “Recent research has shown that 30% of Americans make an effort to limit their meat consumption. That means that 3 in 10 people eat less meat than they otherwise would.” Other participants were presented with a dynamic norm version of the same message: “Recent research has shown that, in the last 5 years, 30% of Americans have now started to make an effort to limit their meat consumption. That means that, in recent years, 3 in 10 people have changed their behavior and begun to eat less meat than they otherwise would.” Those in the dynamic norm condition reported more interest in reducing their own meat consumption in the future. Follow-up studies suggested that this framing led people to assume that more and more people would reduce their meat consumption over time, and so they “preconformed” to this anticipated future norm. In other words, their situation model included a trajectory of continued change, similar to how imperfective aspectual framing leads people to represent actions as ongoing. In this case, dynamic norm framing also led people to infer that the framed behavior is generally considered valuable, which caused them to update their own weighting of the issue.

Let’s return to the car accident you witnessed. Suppose you learn that the driver was an Asian woman. In this case, some people might assume that the accident confirms a well-worn stereotype and assert that “Asian women are bad drivers.” This is a *generic* statement because it expresses a generalization about an entire category of people, not just the individual in question (“Susan is a bad driver”), and it does not quantify or qualify the claim (“*Some* Asian women are

bad drivers *under certain circumstances*”). A large body of research suggests that the use of generic language—*generic framing*—can promote *psychological essentialism*, the belief that members of a category share a deep, inherent nature or “essence” that makes them fundamentally similar (e.g., Benitez et al., 2022; Cimpian & Markman, 2011; Rhodes et al., 2012; but see Noyes & Keil, 2019; Vasilyeva & Lombrozo, 2020).

For example, children are more likely to believe that a property associated with a novel social category is heritable after hearing relevant generic language (e.g., “Zarpies are scared of ladybugs”) than nongeneric language (e.g., “This Zarpie is scared of ladybugs”; Rhodes et al., 2012), even when the property is said to have a cultural origin (e.g., “because they are taught that ladybugs are dangerous”; Benitez et al., 2022). This suggests that the form of the generic—*Xs are Y*—communicates the speaker’s belief that Xs are a “natural kind,” and that even young listeners are sensitive to this implicit message. For this reason, saying “Asian women are bad drivers” imparts the presumption that Asian women have a distinctive nature—that they’re a homogeneous group to whom many stereotypes are likely to apply. This harmful idea may be transmitted by the statement regardless of whether the listener buys the claim that they’re bad drivers (Gelman, 2021; Wodak et al., 2015).

Generic framing is common in scientific communication, which favors broad conclusions delivered in a concise, accessible manner. One study found that readers judged scientific results expressed with generics (e.g., “Group discussion improves lie detection”) as more important and generalizable than the same results expressed nongenerically (e.g., as past-tense statements: “Group discussion improved lie detection”; DeJesus et al., 2019). This converges with evidence that the present tense—a grammatical form that distinguishes generics from nongenerics—implies objective truths and makes the speaker seem more certain of their message relative to the past tense (Packard et al., 2023; for a discussion of how noun labels such as “voter” invite similar essentialist inferences, see Gelman & Roberts, 2017). In scientific communication, such generic framing can be problematic because broad generalizations are often unwarranted from complex, variable data, especially when derived from studies with small, unrepresentative samples (DeJesus et al., 2019; for other “persuasive communication devices” to watch out for in scientific writing, see Corneille et al., 2023). Generic framing is also pervasive in political communication (e.g., “Democrats favor affirmative action”) and poses similar dangers, exaggerating perceived party lines (Novoa et al., 2023).

As the writers of this article, we are hardly immune to the communicative allure of generics. In presenting

a wide variety of findings and conclusions from the framing literature, we have used many generic statements. At the same time, we have been careful to acknowledge nuances and limitations of the evidence (for further discussion in this vein, see “Moderators of Framing Effects” and “Opportunities for Future Research” sections). Nevertheless, if you’re wary of our (generic) framing of the literature, we invite you to evaluate the evidence yourself and draw your own conclusions.

### **Moderators of Framing Effects**

Throughout this article, we have emphasized the general impact of communicative frames and the basic mechanisms that underlie these effects. However, we have also pointed out that there is substantial heterogeneity across different studies and framing manipulations, and some effects do not always replicate across samples or experimental contexts (Bryan et al., 2021; Krefeld-Schwalb et al., 2024). The presence of moderating factors is one reason global effect size estimates in the framing literature tend to be small.<sup>5</sup> In this section, we discuss a number of well-known moderating factors that can increase or decrease the magnitude of various framing effects. This list is not meant to be exhaustive.

#### ***Strength of prior attitudes and beliefs***

Framing effects can weaken, disappear, or even backfire when people have strong prior attitudes or beliefs about the target issue (e.g., Boenke et al., 2022; Chong & Druckman, 2007; Flusberg, van der Vord, et al., 2022; Hardisty et al., 2010; Holmes et al., 2022; Landau et al., 2014; Lecheler et al., 2009; Thibodeau & Boroditsky, 2011, 2013; Thibodeau & Flusberg, 2017). For example, we described a metaphor framing study in the “Priming” section in which a city’s growing crime problem was framed as either a “beast” or a “virus” (Thibodeau & Boroditsky, 2011, 2013). American participants exposed to the beast frame tended to support enforcement-related solutions to the crime problem, such as building more jails and hiring more police officers. This type of solution is conceptually congruent with the beast frame because an issue with an actual beast would be managed by capturing and caging it. Those exposed to the virus frame, on the other hand, tended to endorse reform-related solutions, such as addressing economic and educational issues in the city. These solutions are conceptually congruent with the virus frame because real epidemics require targeting root causes and inoculating people against the problem. Across multiple versions of this experiment, however, only participants who identified as Democrats or Independents showed this framing effect; Republican participants were not

affected by the metaphors. Republicans generally have stronger views on crime and therefore endorsed enforcement-related solutions regardless of framing.

A similar pattern may occur even for ideologically benign stimuli. For example, effects of framing on recall like those we discussed in the “Memory” section (e.g., reproducing O–O as O^O when it is paired with the label “eyeglasses”; Carmichael et al., 1932) may be weaker when memory for the original perceptual stimuli is strong (McCloskey & Zaragoza, 1985). Having a strong memory in these studies is analogous to having strong prior beliefs about crime: In both cases, people are less susceptible to framing.

#### ***Knowledge and interest***

Research on emphasis framing in news media suggests that framing effects are larger when the audience has more knowledge about the target issue—as long as this is not confounded with strong prior attitudes and beliefs (Chong & Druckman, 2007; Druckman & Nelson, 2003). This is because knowledgeable media consumers can more easily connect the content of a message frame with their mental model of the target issue.

Other research suggests that metaphor frames are more effective when the audience is interested in and knowledgeable about the metaphorical source domain (Ottati et al., 1999; Ottati & Renstrom, 2010; Thibodeau et al., 2019). In one experiment, for example, college students listened to an audio recording of a message arguing for a new senior-thesis requirement. The message included either a sports metaphor or a comparable literal filler sentence, and the arguments in the message made either a strong or weak case for the requirement. Stronger arguments have been shown to motivate deeper message processing (Petty & Cacioppo, 1986). In this experiment, however, only students who reported liking sports were persuaded by argument strength when the message included a sports metaphor.

In the case of equivalency framing, knowledge of a domain is sometimes associated with *reduced* framing effects. In an experiment on attribute framing, for example, people with little knowledge of NBA basketball judged a target player more valuable when he was described as “making 60%” of his free throws than when he was described as “missing 40%” (Leong et al., 2017). However, NBA fans didn’t show this framing effect. The fans knew the player’s performance was poor—the average free throw percentage is much higher—and didn’t need to rely on the frame to draw pragmatic inferences about typical free throw rates. That said, even experts in a given domain are susceptible to framing when evaluating decontextualized scenarios, such as when physicians or public-policy professionals are



asked to use aggregated data to choose between medical treatments framed in terms of “survival” or “death” (Banuri et al., 2019; McNeil et al., 1982). In such cases, experts may find it difficult to apply their specialized knowledge, so they rely on the frame instead (Leong et al., 2017).

More generally, heterogeneity in linguistic framing effects may result from misalignments in people’s semantic frames. The knowledge that comes to mind in response to a given word or phrase is not the same for everyone (Martí et al., 2023), which means the same message may structure people’s mental models in different ways. More research on individual differences in semantic knowledge is needed to better address this possibility.

### ***Other individual differences***

Several studies have investigated the moderating impact of individual differences in cognitive and personality traits on valence framing, with somewhat mixed results (Best & Charness, 2015; Druckman & Nelson, 2003; Krefeld-Schwalb et al., 2024; LeBoeuf & Shafir, 2003; Levin et al., 2002; Mahoney et al., 2011; Mandel & Kapler, 2018; McElroy & Seta, 2003; Stark et al., 2017a). For example, people who score higher on measures of “intuitive” or “experiential” thinking styles—relying more heavily on fast, automatic processing—tend to exhibit stronger risky-choice framing effects (Levin et al., 2002; Mahoney et al., 2011; Stark et al., 2017a). Scoring higher on measures of “analytic” or “rational” thinking styles, however, does not consistently moderate risky-choice framing (Levin et al., 2002; Mandel & Kapler, 2018; Stark et al., 2017a). Additionally, a meta-analysis indicated that younger adults are more likely than older adults to choose the risky option when presented with a positive/gain frame, but age does not predict decision-making under negative/loss framing (Best & Charness, 2015).

Some research suggests that individual differences in pragmatic sensitivity also matter: Subject-complement framing effects are stronger for those who can explicitly identify the pragmatic implications of the message frame (Holmes et al., 2022; Holmes, Wu, et al., 2024; Wu et al., 2021). Finally, people approach social interactions with varying levels of receptiveness to opposing views (Minson & Chen, 2022). Although receptiveness has not been directly measured in any study of linguistic framing that we are aware of, it may be an important interpersonal variable for any persuasive communication.

### ***Judgments of the speaker***

Since the time of Aristotle, scholars have known that audience judgments of a speaker moderate the speaker’s persuasive power. This is a core component in

models of persuasion such as the ELM (Petty & Cacioppo, 1986). One critical judgment is speaker credibility: People are more likely to resist a message frame when they view the speaker as having low credibility (Carpenter, 2012; Chong & Druckman, 2007; Druckman, 2001). Conversely, message frames have a greater influence when the speaker or writer is presented as more similar to the message recipient (e.g., in political beliefs, gender, etc.), which enhances their credibility (Baliotti et al., 2021; Lammers et al., 2023).

### ***Nonnative language***

So far, we have taken for granted that people are usually exposed to messages in their native tongue. Some scholars believe, however, that the majority of the world’s population speaks more than one language (e.g., Grosjean, 2010). This means people often encounter message frames in a nonnative language. It is therefore noteworthy that researchers have observed a “foreign-language effect,” in which the influence of a communicative frame is attenuated or even eliminated when a message is presented in a nonnative language (Del Maschio et al., 2022; Hayakawa et al., 2016; Keysar et al., 2012; Liu et al., 2022). In the first demonstration of this phenomenon, native speakers of English and Korean completed a risky-choice framing task in either their native language or their second language (Japanese, English, or French; Keysar et al., 2012). Participants showed the typical framing effect when tested in their native language in that they were more likely to select the sure option under the gain frame than the loss frame. But this framing effect disappeared when participants were tested in their nonnative language.

One explanation for the foreign-language effect is that people react less emotionally to words and ideas expressed in their nonnative language (Hayakawa et al., 2016; Keysar et al., 2012; but see Oganian et al., 2016). This may be because new languages are often learned in a formal academic setting, not in the context of our emotionally rich everyday experiences. Given that affective responses contribute to valence framing effects, the increased emotional distance associated with using a nonnative language may blunt the effects of these message frames. Consistent with this possibility, the foreign-language effect has been shown to be less pronounced (i.e., people show similar framing effects in both languages) when participants acquired their second language from an early age (Flexas et al., 2023) or are presented with less emotionally charged valence framing vignettes (Costa et al., 2014).

Few studies have examined the foreign-language effect using other types of framing manipulations besides valence framing. One exception is a study on

metaphor framing with Indian participants using a task presented in English (Thibodeau et al., 2016). Participants who reported using English in more informal, social contexts (e.g., with friends and family) showed the expected metaphor framing effect, whereas those who reported using English in more formal contexts (e.g., school or work) showed no framing effect. More research is needed to fully unpack the moderating impact of nonnative languages in the broader framing literature.

## Opportunities for Future Research

There are a number of open questions, exciting new avenues to pursue, and other golden opportunities for future research on linguistic framing. This is our positive framing of the problems, limitations, and methodological concerns with the current literature. Here we discuss five important issues: ecological validity; reliability and open science; the need for more precise models; the narrow focus on Western, educated, industrialized, rich, and democratic (WEIRD) societies; and AI. We discuss each issue briefly in turn.

### *Ecological validity*

In the “Behavior” section, we noted that most framing research is conducted in the lab but that researchers are ultimately interested in real-world behavior. In other words, researchers want to know whether framing effects have *ecological validity*. Several field studies have shown promising results, but some studies fail to replicate across different contexts, as we have discussed. One concern is that we don’t yet know how long most framing effects last. Some studies suggest certain framing effects are short-lived (Druckman & Nelson, 2003) whereas others are “surprisingly persistent,” lasting several weeks (Lecheler & de Vreese, 2011). To date, however, no systematic work has assessed the endurance of different framing effects and what this means for real-world impact (but see Baden & Lecheler, 2012).

Another issue is that some framing interventions with a mixed record of success have not been evaluated with respect to the moderating factors we discussed in the previous section, such as knowledge or interest in the target issue or the ability to draw pragmatic inferences from the framing language. For example, teaching students that their brain can “get stronger like a muscle”—a “mindset” intervention designed to improve academic achievement—shows promise, but the strength and reliability of its effects are still under debate (Macnamara & Burgoyne, 2023; Yeager et al., 2019). We recommend that future work address these gaps in the literature

and invest in larger field studies that measure factors likely to modulate behavior in the wild.

### *Reliability and open science*

How reliable are framing effects? Whenever possible, we have presented the results of meta-analyses and cited multiple studies of the same topic to indicate the general robustness of a given finding. Quite deliberately, we have also highlighted several instances in which high-profile studies have failed to replicate, indicating certain effects may be more brittle than they appear in the popular press. Studies showing that a very subtle framing device dramatically changes real-world behaviors or strongly held attitudes seem especially difficult to replicate. This is not surprising. Framing manipulations are often designed to be inconspicuous, and human reasoning is complex and sensitive to many factors. In addition, framing research has historically suffered from many of the same methodological deficiencies as the rest of the social and behavioral sciences (Shrout & Rodgers, 2018).

Therefore, we support the emerging “credibility revolution” that was sparked by the “replication crisis” in psychology and other sciences (Shrout & Rodgers, 2018; Vazire, 2018). This movement embraces principles of open science, which include greater transparency about research practices, preregistration of studies, more direct replications of key findings, and improved standards for evaluating the quality of evidence. Simultaneously, we think researchers and science communicators should recognize that heterogeneity in behavioral intervention effects is to be expected (Bryan et al., 2019, 2021). We encourage people to carefully consider context effects, individual differences, and other moderating factors.

### *More precise models*

Many discussions of framing rely on overly broad, descriptive theories or general process models of the phenomenon of interest, such as the ELM (see also “Mechanics of Communication and Linguistic Framing” section). Researchers in cognitive psychology and behavioral economics have formalized models of certain valence framing effects (Huizenga et al., 2023), but these do not generalize beyond a very restricted domain (see also Schwartzstein & Sunderam, 2021). This leaves researchers and those who wish to use framing techniques with only a vague idea of where to start. In most cases, we can’t even specify whether a language manipulation provides the right “dose” to elicit a framing effect without a great deal of testing (Rothman et al., 2020). Therefore, we recommend that researchers

develop more precise models of linguistic framing effects, integrating insights from across the various disciplines that contribute to this field.

### ***WEIRD problems***

Like many areas of psychology and communication, research on framing suffers from a number of WEIRD problems (de Oliveira & Baggs, 2023; Henrich et al., 2010). Most researchers, participant samples, and languages used in this work originated from WEIRD societies, largely in the Anglophone world. To the extent that we are interested in understanding and motivating people in these societies, this narrow focus is not an issue. However, if our ultimate goal is to develop general theories of language, framing, and persuasion, then this is a significant problem. A majority of humans are not from WEIRD societies, and any research that fails to account for the full range of human variation is inherently limited. We know that languages and cultures differ in a number of important ways that can have downstream effects on cognitive processing (see Box 1; see also Blasi et al., 2022). Therefore, we recommend that framing researchers form more multidisciplinary, cross-cultural, and cross-linguistic collaborations in future work.

### ***Artificial Intelligence***

AI has advanced rapidly in recent years. The development of large language models (LLMs) such as ChatGPT means we can now have complex, interactive conversations with systems that communicate in surprisingly sophisticated—and sometimes perplexing—ways. Users frequently share tips for eliciting better responses from these chatbots, making suggestions for how to elaborate a message and follow up in a dialogue to get the best results. Such “prompt engineering” is really just framing under another guise (or lexical frame). Researchers have recently shown that LLMs can be used to generate persuasive, microtargeted political ads at scale, which raises concerns about the use of these systems by bad actors (Simchon et al., 2024). However, such advances also present an opportunity for researchers. The systematic study of framing in LLMs may help us better understand both these systems and ourselves.

### **Recommendations for Effective Framing**

From the beginning of this article, we have emphasized that framing effects are ubiquitous—a natural and unavoidable consequence of human communication. We must always select one communicative frame or another, whether we are trying to convince a friend to

join us on a spontaneous adventure, sell a new product, create a health-messaging campaign, or solicit a donation to our favorite nonprofit. But, as we have seen, some frames are more influential than others. In this section, we offer step-by-step guidelines for effective framing, emphasizing applications in the public interest. Although our recommendations are intended to be applicable in many different contexts, our examples focus on the promotion of health-related policies and initiatives:

1. *Who's your audience?* First, you should think about your target audience. What is its makeup, and what are their values, needs, goals, and knowledge base? How receptive are they to opposing views (Minson & Chen, 2022)? What is the cultural context of the communication? Research suggests that matching features of your message frame to the characteristics of your audience can enhance your persuasive power (Baliotti et al., 2021; Feinberg & Willer, 2019; Joyal-Desmarais et al., 2022; Tappin et al., 2023; but for guidance on when and why matching a message to a recipient may backfire, see Teeny et al., 2021). We recommend leveraging this fact as you craft your message frame. For example, if you are speaking to a conservative audience in the United States about a new health-care policy, it might help to frame the discussion in terms of values such as loyalty or patriotism rather than fairness or harm. You could say, for instance, that we have a patriotic duty to keep Americans healthy and that loyal citizens must ensure that our children and elders have access to lifesaving medicine.
2. *What is your goal?* Next you must determine your goal. Are you aiming to change attitudes, beliefs, or behaviors? If you are targeting behaviors, what is it you want your audience to *do*? Is the behavior easy or hard? Is it a one-off, short-term action (such as making a donation) or a long-term, habitual one (such as increasing weekly exercise)? Your choice of communicative frame will depend greatly on how you intend your message recipients to respond. If you are aiming to shift attitudes toward a new health-care initiative, for example, more valenced language could help. If you want to improve people's understanding of a complex issue such as vaccination or government spending on health care, on the other hand, then using an extended metaphor may be most effective.
3. *Consult existing research.* As we have surely demonstrated by now, the literature on framing is

**Box 1.** How Framing Informs Linguistic Relativity

Approximately 7,000 languages are spoken on Earth, and their diversity is astonishing (N. Evans & Levinson, 2009; Malt & Majid, 2013). As N. Evans and Levinson (2009) observed: “Languages differ so fundamentally from one another at every level of description (sound, grammar, lexicon, meaning) that it is very hard to find any single structural property they share” (p. 429). As a result, the semantic systems of different languages—their repertoire of communicative frames—differ in systematic ways. This includes not only idiosyncratic expressions tied to local cultural concerns but also category labels, conventional metaphors, and grammatical devices that communicate seemingly core aspects of human experience. Unlike English, for example, Russian and Greek distinguish categorically between light and dark shades of blue (Thierry et al., 2009; Winawer et al., 2007); Turkish and Farsi describe high and low tones using words for thin and thick (Dolscheid et al., 2013, 2020); and German and Swedish lack aspectual markers for distinguishing ongoing from completed events (e.g., “was swerving” vs. “swerved”; see “Grammatical Framing” section; Athanasopoulos & Bylund, 2013).

The amateur linguist Benjamin Lee Whorf famously argued that differences of this sort lead speakers of different languages to form different conceptions of reality (Whorf, 1940/2012). Writing in the early 20th century, Whorf wasn’t aware of the myriad examples of linguistic variation that scientists have since documented. Instead, he relied on his own informal (and often flawed) observations, many of which were inspired by his work as an inspector for the Hartford Fire Insurance Company. In one much-cited anecdote, an explosion occurred after a factory worker carelessly tossed a burning cigarette into a drum labeled “empty” that was actually filled with hazardous vapor. This, it would seem, is a framing effect: The communicative frame “empty” led to a behavior with disastrous consequences, perhaps because it prompted the worker to construct a situation model of the apparently “null and void, negative, inert” contents of the drum (Whorf, 1940/2012, p. 175).

Then again, the explosion may have occurred simply because the vapor-filled drum *appeared* empty to the worker, not because it was labeled that way (Lenneberg, 1953; Pinker, 1994). For good reason, many scholars roundly dismissed this example and most of Whorf’s other linguistic observations as misleading or erroneous in implicating language as the source of apparent cognitive and behavioral patterns. This delayed serious consideration of the claim that speakers of different languages think differently—the so-called Whorfian, Sapir-Whorf, or linguistic relativity hypothesis—until many decades later, when the science finally caught up with the hype (Gentner & Goldin-Meadow, 2003).

Today, linguistic relativity enjoys a more positive reception in the literature, and research on framing can help explain why. The Whorfian hypothesis essentially has three parts (Wolff & Holmes, 2011). First, languages differ in how their lexicons and grammatical structures partition the world. This assertion—Whorf’s shoddy linguistics notwithstanding—is now indisputable. Second, the lexicon and grammatical structure of a given language influence how its speakers think and reason about the world. This claim is supported by the research we’ve discussed in this article, which provides many striking demonstrations of language’s impact on cognition, albeit mostly in English (which may be why classic and contemporary framing research is rarely cited in the linguistic relativity literature; cf. Blasi et al., 2022).

Finally, if the first two propositions are true, it seems to follow that speakers of different languages will think and reason about the world in ways that mirror the lexical and grammatical differences in their languages. Much recent research supports this conclusion through cross-linguistic comparisons of all the aspects of cognition we surveyed in the “What Does Language Do?” section, among others (for review, see Wolff & Holmes, 2011). For example, Russian and Greek speakers display enhanced discrimination of colors at their language’s boundary between light and dark blue (Thierry et al., 2009; Winawer et al., 2007); Turkish and Farsi speakers match low (“thick”) tones to thick, high lines rather than thin, low lines (Dolscheid et al., 2013, 2020); and German and Swedish speakers give more weight to endpoints than midpoints when judging the similarity of motion events (Athanasopoulos & Bylund, 2013; Athanasopoulos et al., 2015). English speakers show none of these patterns.

Importantly, none of these are “framing” effects in the sense we have been using this term: The stimuli in these studies (and the format of participants’ responses) involve little to no language. This is a strength in linguistic relativity research because it suggests that speakers of different languages think differently even when they’re not “thinking for speaking” (Boroditsky, 2001; Slobin, 1996). Nevertheless, the mechanisms of framing we’ve discussed in this article can help make sense of these cross-linguistic differences. As we suggested earlier, languages have systematically different communicative frames: different color words, pitch metaphors, aspectual markers, and so on. And as we discussed in the “Mechanics of Communication and Linguistic Framing” section, communicative frames evoke situation models in the minds of readers and listeners that have downstream

(continued)

**Box 1.** (continued)

consequences for thought and behavior, mediated by a host of cognitive, social-pragmatic, and emotional mechanisms. This means speakers of different languages—who habitually use different communicative frames—will habitually construct different situation models. As a result, we would expect them to perform differently on tasks in which these mental models are used to answer questions or solve problems. This is exactly what the linguistic relativity literature indicates. From this framing-informed perspective, cross-linguistic differences in cognition are the consequences of a lifetime of exposure to the communicative frames of one’s native language.

Of course, just because speakers of different languages exhibit different patterns of thought or behavior doesn’t mean language was the *cause* of them. That’s because linguistic differences are often confounded with differences in culture, environment, and life experience (Casasanto, 2005; Li & Gleitman, 2002). For example, speakers of languages that grammatically distinguish present from future events (e.g., English: “It’s raining” vs. “It’s going to rain”) tend to save less money than speakers of “futureless” languages that conflate the two tenses (M. K. Chen, 2013), but this correlation disappears when accounting for historical and geographical relationships between languages that track shared cultural values (Roberts et al., 2015; but see Ayres et al., 2023).

In many studies, however, “extra-linguistic” factors such as these can be ruled out through experimental manipulations that establish a causal role for language. One approach is to have participants complete a “verbal interference” task that blocks their mental access to language, such as shadowing speech or mentally rehearsing a string of digits. Cross-linguistic differences often disappear under verbal interference, suggesting that they were driven by language and not some other factor (for a systematic review of verbal interference studies, see Nedergaard et al., 2023).

Another approach is to expose speakers of one language to a “concentrated dose” of the lexical or grammatical patterns of another language (e.g., Boroditsky, 2001; Casasanto, 2008; Dolscheid et al., 2013; Fausey et al., 2010). This is essentially a framing manipulation, in which a new set of communicative frames is introduced and their impact is assessed. After exposure to the “new language,” participants often perform like speakers of that language typically do on tasks previously shown to yield a cross-linguistic difference. This suggests that language alone can create the difference. It also reinforces the point that habitual use of certain communicative frames—presumably the sum of many short-term exposures—drives many linguistic relativity effects.

For some scholars, the fact that a short-term linguistic manipulation can temporarily override habitual thought patterns is evidence that the effects of language don’t run very deep (Gleitman & Papafragou, 2012; January & Kako, 2007). For framing researchers, however, short-term effects are par for the course. Most of the findings reviewed in this article concern the influence of language on in-the-moment decision-making, guided by our current (but subject-to-change) mental model of the target issue or situation. Although longer-lasting effects might bolster the real-world impact of framing, even temporary effects can be powerful if they result in important decisions or behaviors. Several recent accounts of linguistic relativity dovetail with framing research in emphasizing the dynamic, context-sensitive nature of human thought—and the potential for language to meddle with it (Athanasopoulos et al., 2015; Casasanto, 2016; Lupyan et al., 2020; Ünal & Papafragou, 2016).

vast. This is both a blessing and a curse. It certainly makes locating and synthesizing relevant findings a daunting prospect, although hopefully we have done some of this work for you. The plus side is that researchers have examined hundreds if not thousands of individual framing techniques across a wide range of messaging contexts. We suggest consulting this literature for guidance as you construct your message frame. There is no need to reinvent the wheel when hundreds of scholars have been prototyping and testing different tires, hubcaps, and axles for decades. The taxonomy we have laid out in this article (see Table 3) is a good place to start. For

example, we reviewed much research on the impact of goal framing in health communication, showing that gain and loss frames may be better suited to different target behaviors (disease prevention vs. detection, respectively).

4. *Engage the emotions wisely.* The power of emotional appeals has been recognized for as long as people have been thinking about persuasive language. And for good reason. Emotions can motivate interest, engagement, concern, and action. But they can also motivate violent outrage, polarization, helplessness, and withdrawal. We recommend designing communicative frames carefully to leverage the positive power of

emotions without slipping into extreme partisan rhetoric or negative doomsaying (for examples related to climate change communication, see Box 2). For example, to inspire a sense of urgency and concern during a health-care emergency, such as when a new virus is circulating in the population, using negatively valenced language (e.g., war metaphors) may be a productive first step—but only if you follow it with a more optimistic message about how to address the issue. Giving people hope that a problem can be solved is critical to getting people to engage and not tune out.

5. *Generate your frame.* Only at this stage should you draft your message frame. We recommend thinking about the mental model you would like your audience to adopt and working backward, assessing how different linguistic cues (e.g., labels, metaphors, grammatical constructions) might or might not help instantiate this model. Once again, the taxonomy in Table 3 may be useful, and we have provided many other relevant examples throughout this article. For example, imagine your goal is to increase the number of people who participate in a regular screening for skin cancer. The mental model you'd like to communicate is that more and more people are getting this screening because it can help detect the disease when it is still very treatable. Working backward, then, you could combine dynamic norm framing with goal (loss) framing, generating a message such as “Recent research has shown that, in the last 5 years, 30% of Americans have now started to get screened for skin cancer every year. If you do not engage in regular screenings, you will have a decreased chance of finding skin cancer in the early, more treatable stage of the disease. Talk to your dermatologist today!”
6. *Provide opportunities for action.* The effects of a message frame will likely be short-lived, quickly overshadowed by the passage of time and other conflicting messages. We recommend providing an opportunity for action as quickly as possible (cf. Lakoff, 2010). This can be small, such as acquiring a signature or email address, or it can be larger, such as securing a donation or purchase right away. Engaging a behavioral commitment early on makes it more likely that the impact of your message will make a difference. Following up on the example provided in the previous step, for example, you could partner with a mobile clinic that offers free or low-cost skin-cancer screenings and meets people where they are. As soon as your target audience is exposed to the message frame, you could invite them to get screened at their earliest convenience.
7. *Test your message.* After reading through this article, you have hopefully improved your intuitions for which message frames are likely to be effective. That's great, but intuitions are only a starting point. Just because several studies have found that a particular framing device is effective in one domain, with one group of people, does not mean it will work in another domain, with another group of people. Many framing effects are subtle and context-dependent. We recommend, therefore, that you use some of the methodological techniques we have described to test, evaluate, and improve your messages. Many researchers, companies, advertisers, and political campaigns do just that. For example, a recent study examined the impact of different explanatory metaphors in vaccine communication and compared them to briefer, more “literal” explanations (Flusberg et al., 2024). The two types of explanations improved vaccine attitudes to a similar degree. However, metaphorical explanations led people to generate more elaborate explanations of their own, suggesting they have an advantage in facilitating further social communication about this issue.
8. *Be open to reframing.* We also recommend that you remain flexible and are willing to change and update your message frames over time as circumstances change. Although repetition can increase the saliency of a message, people may come to resist popular framings. For example, using a violent battle metaphor may be a good first step to attract attention and impart a sense of urgency for an issue such as a pandemic, but the effects of such language could backfire over time as the audience realizes there is no way to truly “win” the war (Flusberg et al., 2018). A more apt metaphor in this case might be fire-fighting, in which a contagion is likened to a fire spreading in a forest, and the more tractable goal is to control and reduce the spread rather than “kill” the entire fire (Semino, 2021).
9. *Temper your expectations.* Language is powerful, but it's not a magic bullet. Study after study (and meta-analysis after meta-analysis) shows that framing effects are relatively small, so changing your message frame will likely have only a modest impact on your audience (O'Keefe & Hoeken, 2021). Of course, if a message spreads through a large enough population, even marginal returns could yield a significant real-world impact. But most of us don't have that reach. Real,

**Box 2.** Framing in Environmental Communication

Anthropogenic climate change poses an existential threat to humanity. Even if you are skeptical of such claims, you probably appreciate clean air and water and a healthy natural environment. Scientists, activists, and political leaders have deployed a wide range of messaging strategies to advance several interrelated, proenvironmental goals. Some messages are used to drum up support for new policies, programs, or regulations (attitude change). Others are aimed at increasing public understanding of complex ideas, such as why excess carbon emissions cause global warming (belief change). And still others are used to elicit donations to environmental causes or votes for proenvironmental candidates (behavior change). Researchers in this space have tested the efficacy of many of the framing techniques we described in the “A Taxonomy of Framing Devices” section.

Homar and Cvelbar (2021) provided a systematic review of *valence framing* effects on environmental decision-making. On the whole, negative/loss frames were found to be more effective than positive/gain frames for increasing proenvironmental intentions and behaviors. The authors recommend that environmentally relevant decisions be framed in terms of a potential loss or negative consequence that must be prevented. Gain framing can be effective in some contexts, but mostly for improving attitudes toward an issue rather than eliciting behavior change.

*Metaphor framing* is pervasive in environmental messaging, from the “war” on coal and the “race” to net-zero emissions to carbon “footprints” and “greenhouse” gases. Flusberg and Thibodeau (2023) recently conducted a broad assessment of the literature on English metaphors in environmental discourse, highlighting several promising message frames. For example, (a) describing the earth as our “common home” may help people feel more connected to nature, which has been shown to increase proenvironmental attitudes (see Thibodeau, Frantz, & Berretta, 2017); (b) explaining how the atmosphere functions as a “giant bathtub” can help people understand why carbon emissions continue to accumulate and drive global warming (see Guy et al., 2013); and (c) war metaphors can enhance the sense of urgency and risk surrounding climate change and increase intentions to behave in ways that would mitigate those risks (see Flusberg et al., 2017). However, there have not been many large, replicable studies of metaphor framing in environmental messaging, so much of this work remains speculative.

One compelling idea is that people struggle to engage with the issue of climate change because it seems so psychologically distant (Van Lange & Huckelba, 2021). It can feel like an abstract problem that affects other people who live far away and will only affect us in the distant future. This suggests that *psychological distance framing* may be effective if it can be used to make climate change feel more proximal and concrete. The research on this topic is promising but mixed. A recent large-scale study conducted in more than 60 countries found that framing climate change as psychologically close increased belief in climate change more than any other intervention, but the magnitude of this effect was modest (Vlasceanu et al., 2024). And neither this nor any of 10 other expert-backed interventions increased people’s motivation to engage in effortful climate-mitigation behaviors such as tree planting. Another set of experiments found that narrative stories about climate change were more effective than informational texts for eliciting proenvironmental behaviors (Morris et al., 2019). This was due to the fact that the narratives were more emotionally engaging. However, communicating statistics about the scientific consensus on climate change can also increase belief in climate change and support for environmental policies (van der Linden, 2021). Other studies that have directly manipulated the perceived psychological distance of climate change have yielded inconsistent results, suggesting that moderators and other contextual factors are relevant for this type of messaging (Maiella et al., 2020; Yang et al., 2021). For example, greater psychological closeness may increase the impact of a loss-framed environmental message, whereas greater psychological distance may increase the impact of a gain-framed message (Homar & Cvelbar, 2021).

Research on *lexical framing* and *moral reframing* highlights the importance of individual differences in environmental communication. Studies suggest that people who are more ideologically conservative, culturally individualistic, and supportive of free-market principles are more skeptical of climate change and resistant to standard environmental messaging (Hornsey & Fielding, 2020). Therefore, messages that appeal to these values should be more effective. In one experiment, American participants had to choose which of two products they would purchase (e.g., airline flights; Hardisty et al., 2010). The products were identical, but one was slightly more expensive so that the extra profits could be used to fund carbon-reduction programs. The extra cost was labeled either a carbon “tax” or a carbon “offset.” Republican and Independent participants were significantly more likely to choose the pricier product when it was labeled an “offset” rather than a “tax,” presumably because they are ideologically opposed to new taxes. Many other experiments have shown that invoking conservative values such

(continued)

**Box 2.** (continued)

as loyalty, patriotism, and purity can enhance proenvironmental attitudes and behavior among conservative participants (e.g., Feinberg & Willer, 2013; Feygina et al., 2010; Hurst & Stern, 2020; Kidwell et al., 2013; Wolsko et al., 2016).

There are several additional factors to consider in environmental messaging. First, emotions play a critical but nuanced role. Negative feelings, including a sense of urgency, fear, and concern about the future, are especially motivating. But too much negativity is counterproductive. Dire messaging about climate change has been shown to backfire, reducing belief in global warming by threatening people's sense that the world is a just place (Feinberg & Willer, 2011). Strong negative emotions can also undermine feelings of efficacy and promote the sense that nothing can be done to address environmental devastation. Therefore, positive feelings, such as a sense of hope, are important (Geiger et al., 2023; Nabi et al., 2018), although too much optimism can make the potential impact of climate change on our own lives seem insubstantial (Hornsey & Fielding, 2016). Taken together, this work suggests that environmental messages should be carefully crafted to elicit the right balance of emotional response.

Second, messages may be more effective if they target certain dimensions of climate change over others. A meta-analysis by Li and Su (2018) found that message frames were largely ineffective when they focused on geographical identity or public health but had small-to-medium-sized effects on engagement when they focused on the moral, economic, and environmental aspects of climate change. It may therefore be a good idea to emphasize these dimensions in climate communication.

Finally, environmental issues are enormously complex and require massive, cooperative, and systemic solutions. Leveraging the power of social norms to encourage behavior change is one promising avenue to pursue (Constantino et al., 2022), and *dynamic norm framing* may be helpful in this regard (Loschelder et al., 2019; Sparkman & Walton, 2017). However, such interventions are “no panacea” (Constantino et al., 2022). Message framing effects are typically small and transient. To maximize their impact, they must be coupled with immediate opportunities for action and embedded within broader social and political movements aimed at enacting meaningful structural changes across the globe (Constantino et al., 2022; Flusberg & Thibodeau, 2023; Lakoff, 2010).

long-lasting change in attitudes, beliefs, and behavior will take more than a single slogan, article, advertisement, or conversation. Investing in deeper structural changes will be the only way to address complex issues such as health-care policy, climate change, and social inequality.

## Conclusions: Language in the Public Interest

Language is the fuel that powers social and political life. It's through language that coalitions and movements are formed and reformed, new policies and ideas are generated and spread, and leaders inspire hope, excitement, and fear. As a result, it's in the public's interest to better understand how and why language shapes the way we think, feel, and act—how communicative frames can shape and restructure our mental models of the world. We began this article with a meditation on speculative fiction, in which language is often presented as an irresistible force that undermines our free will. There is a kernel of truth to this idea: Linguistic messages can trigger a cascade of cognitive and

emotional reactions that influence our behavior. A deeper understanding of the psychology of framing can enhance not only our communication skills and ability to navigate our linguistic environments but also our prospects for getting things done. The research we have reviewed serves as a reminder to be mindful of both the words and phrases we use ourselves and the ones that grab our attention or generate a strong emotional response. We don't like to be cynical about people's intentions, but we think it's wise to consider the goals and incentives behind the loud voices that intrude on daily life in the media, in the public square, and online, including sometimes our own.

But remember that Newspeak is science fiction, not fact. Language is powerful, but it doesn't transform us into mindless marionettes. Most framing effects are a sensible response to the information that is communicated by a linguistic message, and most are quite modest in size. We always have the power to take control of the narrative, so to speak. We can seek out alternative opinions and arguments, reframe issues and events to ourselves and to others, and engage in careful reflection and thoughtful dialogue to develop a richer



understanding of the world around us. What's more, we can leverage these insights to promote positive policy reforms, environmental and health-care initiatives, and other vital causes in the public interest.

## Transparency

*Action Editor:* Nora Newcombe

*Editor:* Nora Newcombe

### *Declaration of Conflicting Interests*

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

## Notes

1. Cognitive scientist David Rumelhart used a different metaphor to make a similar point (as cited in Elman, 2009): "My approach suggests that comprehension, like perception, should be likened to [a] paleontologist, who uses his beliefs and knowledge about dinosaurs in conjunction with the clues provided by the bone fragments available to construct a full-fledged model of the original. In this case the words spoken and the actions taken by the speaker are likened to the clues of the paleontologist, and the dinosaur, to the meaning conveyed through these clues" (p. 548).

2. One consequence of needing prior knowledge to "decode" language is that stories are difficult to understand if we can't activate the right frames. Words are more abstract than many people presume (Lupyan & Winter, 2018), so the same words mean different things in different contexts. Without the proper frame in mind, generating a coherent situation model may be impossible. For example, consider the following description:

The procedure is actually quite simple. First you arrange things into different groups depending on their makeup. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities, that is the next step; otherwise you are pretty well set. It is better to do too few things at once than too many. Remember mistakes can be expensive. At first the whole procedure will seem quite complicated. Soon, however, it will become just another fact of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never knows.

If you're anything like us—or the participants in the original experiment that used this vignette (Bransford & Johnson, 1972)—you are probably struggling to make heads or tails of this paragraph. This is the case even though you are familiar with all of the individual words. Things would be different if we had provided a title that evoked the proper frame, such as "How to do laundry." If you reread the paragraph with this frame in mind, you should be able to generate a coherent situation model with the meaning of each word falling into place. The laundry frame is metacommunicative, to use Bateson's (1972/1987) term: it tells you how to interpret the rest of the message so you can successfully decode what, for example, "things" and "facilities" mean in this context.

3. That said, moral reframing may also rely on schematic restructuring because the audience is led to view the target issue in

a new way, through the lens of a moral value they hold dear.

4. Our moods, feelings, and emotions vary along two dimensions that comprise what psychologists call "core affect": *valence*, or the degree of positivity or negativity, and *arousal*, or the degree of intensity (Russell, 2003). Most researchers who discuss affect in the context of framing and persuasive messaging focus on the valence dimension (e.g., Slovic et al., 2007), but it's likely that arousal plays a role as well (e.g., Flusberg et al., 2018).

5. O'Keefe (2017b) argued that people often misunderstand effect size estimates in message effects research. The effect size indicates the *relative* efficacy of one message frame versus another, not the *absolute magnitude* of a particular effect. This type of research typically compares two or more message frames to each other (e.g., narratives vs. statistics, or Metaphor A vs. Metaphor B). So, a small effect size does not necessarily mean that a message frame has little impact on its own, because it is rarely compared to a pretest score or baseline condition with no message. Rather, a small effect size indicates that a message frame is only slightly more impactful than the other message frame it is being compared to.

## References

- Adams, R. B., Ambady, N., Macrae, C. N., & Kleck, R. E. (2006). Emotional expressions forecast approach-avoidance behavior. *Motivation and Emotion, 30*, 177–186. <https://doi.org/10.1007/s11031-006-9020-2>
- Ajzen, I., Fishbein, M., Lohmann, S., & Albarracín, D. (2018). The influence of attitudes on behavior. In D. Albarracín & B. T. Johnson (Eds.), *The handbook of attitudes. Vol. 1: Basic principles* (pp. 197–255). Routledge.
- Aka, A., Bhatia, S., & McCoy, J. (2023). Semantic determinants of memorability. *Cognition, 239*, Article 105497. <https://doi.org/10.1016/j.cognition.2023.105497>
- Aka, A., Phan, T. D., & Kahana, M. J. (2021). Predicting recall of words and lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 47*(5), 765–784. <https://doi.org/10.1037/xlm0000964>
- Alam, N., & So, J. (2020). Contributions of emotional flow in narrative persuasion: An empirical test of the emotional flow framework. *Communication Quarterly, 68*(2), 161–182. <https://doi.org/10.1080/01463373.2020.1725079>
- Albarracín, D., Sunderrajan, A., Lohmann, S., Chan, M. P. S., & Jiang, D. (2018). The psychology of attitudes, motivation, and persuasion. In D. Albarracín & B. T. Johnson (Eds.), *The handbook of attitudes. Vol. 1: Basic principles* (pp. 3–44). Routledge.
- Alogna, V. K., Attaya, M. K., Aucoin, P., Bahnik, Š., Birch, S., Birt, A. R., Bornstein, B. H., Bouwmeester, S., Brandimonte, M. A., Brown, C., Buswell, K., Carlson, C., Carlson, M., Chu, S., Cislak, A., Colarusso, M., Colloff, M. F., Dellapaolera, K. S., Delvenne, J.-F., . . . Zwaan, R. A. (2014). Registered replication report: Schooler and Engstler-Schooler (1990). *Perspectives on Psychological Science, 9*(5), 556–578. <https://doi.org/10.1177/1745691614545653>
- Alter, A. L., & Oppenheimer, D. M. (2006). Predicting short-term stock fluctuations by using processing fluency. *Proceedings of the National Academy of Sciences, USA, 103*(24), 9369–9372. <https://doi.org/10.1073/pnas.06010711103>

- Anderson, E. C., & Barrett, L. F. (2016). Affective beliefs influence the experience of eating meat. *PLOS ONE*, *11*(8), Article e0160424. <https://doi.org/10.1371/journal.pone.0160424>
- Areni, C. S., & Sparks, J. R. (2005). Language, power, and persuasion. *Psychology & Marketing*, *22*(6), 507–525. <https://doi.org/10.1002/mar.20071>
- Ariely, D. (2008). *Predictably irrational*. HarperCollins.
- Asch, S. (1946). Forming impressions of personality. *Journal of Abnormal Social Psychology*, *41*(3), 258–290. <https://doi.org/10.1037/h0055756>
- Athanasopoulos, P., & Bylund, E. (2013). Does grammatical aspect affect motion event cognition? A cross-linguistic comparison of English and Swedish speakers. *Cognitive Science*, *37*(2), 286–309. <https://doi.org/10.1111/cogs.12006>
- Athanasopoulos, P., Bylund, E., Montero-Melis, G., Damjanovic, L., Schartner, A., Kibbe, A., Riches, N., & Thierry, G. (2015). Two languages, two minds: Flexible cognitive processing driven by language of operation. *Psychological Science*, *26*(4), 518–526. <https://doi.org/10.1177/0956797614567509>
- Ayres, I., Katz, T. K., & Regev, T. (2023). Languages and future-oriented economic behavior—Experimental evidence for causal effects. *Proceedings of the National Academy of Sciences, USA*, *120*(7), Article e2208871120. <https://doi.org/10.1073/pnas.2208871120>
- Baden, C., & Lecheler, S. (2012). Fleeting, fading, or far-reaching? A knowledge-based model of the persistence of framing effects. *Communication Theory*, *22*(4), 359–382. <https://doi.org/10.1111/j.1468-2885.2012.01413.x>
- Baliotti, S., Getoor, L., Goldstein, D. G., & Watts, D. J. (2021). Reducing opinion polarization: Effects of exposure to similar people with differing political views. *Proceedings of the National Academy of Sciences, USA*, *118*(52), Article e2112552118. <https://doi.org/10.1073/pnas.2112552118>
- Banuri, S., Dercon, S., & Gauri, V. (2019). Biased policy professionals. *The World Bank Economic Review*, *33*(2), 310–327. <https://doi.org/10.1093/wber/lhy033>
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge University Press.
- Bateson, G. (1987). *Steps to an ecology of mind: Collected essays in anthropology, psychiatry, evolution, and epistemology*. Jason Aronson Inc. (Original work published 1972)
- Benitez, J., Leshin, R. A., & Rhodes, M. (2022). The influence of linguistic form and causal explanations on the development of social essentialism. *Cognition*, *229*, Article 105246. <https://doi.org/10.1016/j.cognition.2022.105246>
- Bergen, B. K. (2012). *Louder than words: The new science of how the mind makes meaning*. Basic Books.
- Berger, J. (2023). *Magic words: What to say to get your way*. Harper Business.
- Bermúdez, J. L. (2020). *Frame it again: New tools for rational decision-making*. Cambridge University Press.
- Best, R., & Charness, N. (2015). Age differences in the effect of framing on risky choice: A meta-analysis. *Psychology and Aging*, *30*(3), 688–698. <https://doi.org/10.1037/a0039447>
- Blankenship, K. L., & Craig, T. Y. (2011). Language use and persuasion: Multiple roles for linguistic styles. *Social and Personality Psychology Compass*, *5*(4), 194–205. <https://doi.org/10.1111/j.1751-9004.2011.00344.x>
- Blasi, D. E., Henrich, J., Adamou, E., Kemmerer, D., & Majid, A. (2022). Over-reliance on English hinders cognitive science. *Trends in Cognitive Sciences*, *26*(12), 1153–1170. <https://doi.org/10.1016/j.tics.2022.09.015>
- Bloemraad, I., Silva, F., & Voss, K. (2016). Rights, economics, or family? Frame resonance, political ideology, and the immigrant rights movement. *Social Forces*, *94*(4), 1647–1674. <https://doi.org/10.1093/sf/sov123>
- Boenke, L., Panning, M., Thurow, A., Hörisch, J., & Loschelder, D. D. (2022). Who can nudge for sustainable development? How nudge source renders dynamic norms (in-) effective in eliciting sustainable behavior. *Journal of Cleaner Production*, *368*, Article 133246. <https://doi.org/10.1016/j.jclepro.2022.133246>
- Boeynaems, A., Burgers, C., & Konijn, E. A. (2021). When figurative frames decrease political persuasion: The case of right-wing anti-immigration rhetoric. *Discourse Processes*, *58*(3), 193–212. <https://doi.org/10.1080/0163853X.2020.1851121>
- Boroditsky, L. (2001). Does language shape thought? Mandarin and English speakers' conceptions of time. *Cognitive Psychology*, *43*(1), 1–22. <https://doi.org/10.1006/cogp.2001.0748>
- Bower, G. H., Black, J. B., & Turner, T. J. (1979). Scripts in memory for text. *Cognitive Psychology*, *11*(2), 177–220. [https://doi.org/10.1016/0010-0285\(79\)90009-4](https://doi.org/10.1016/0010-0285(79)90009-4)
- Braddock, K., & Dillard, J. P. (2016). Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors. *Communication Monographs*, *83*(4), 446–467. <https://doi.org/10.1080/03637751.2015.1128555>
- Brown, M., Keefer, L. A., Sacco, D. F., & Bermond, A. (2019). Is the cure a wall? Behavioral immune system responses to a disease metaphor for immigration. *Evolutionary Psychological Science*, *5*, 343–356. <https://doi.org/10.1007/s40806-019-00191-3>
- Bruckmüller, S., & Abele, A. E. (2010). Comparison focus in intergroup comparisons: Who we compare to whom influences who we see as powerful and agentic. *Personality and Social Psychology Bulletin*, *36*(10), 1424–1435. <https://doi.org/10.1177/0146167210383581>
- Bruckmüller, S., Hegarty, P., & Abele, A. E. (2012). Framing gender differences: Linguistic normativity affects perceptions of power and gender stereotypes. *European Journal of Social Psychology*, *42*(2), 210–218. <https://doi.org/10.1002/ejsp.858>
- Brugman, B. C., Burgers, C., & Vis, B. (2019). Metaphorical framing in political discourse through words vs. concepts: A meta-analysis. *Language and Cognition*, *11*(1), 41–65. <https://doi.org/10.1111/comt.12096>
- Bryan, C. J., Adams, G. S., & Monin, B. (2013). When cheating would make you a cheater: Implicating the self prevents unethical behavior. *Journal of Experimental Psychology: General*, *142*(4), 1001–1005. <https://doi.org/10.1037/a0030655>
- Bryan, C. J., Master, A., & Walton, G. M. (2014). “Helping” versus “being a helper”: Invoking the self to increase helping

- in young children. *Child Development*, 85(5), 1836–1842. <https://doi.org/10.1111/cdev.12244>
- Bryan, C. J., Tipton, E., & Yeager, D. S. (2021). Behavioural science is unlikely to change the world without a heterogeneity revolution. *Nature Human Behaviour*, 5(8), 980–989. <https://doi.org/10.1038/s41562-021-01143-3>
- Bryan, C. J., Walton, G. M., Rogers, T., & Dweck, C. S. (2011). Motivating voter turnout by invoking the self. *Proceedings of the National Academy of Sciences, USA*, 108(31), 12653–12656. <https://doi.org/10.1073/pnas.1103343108>
- Bryan, C. J., Yeager, D. S., & O'Brien, J. M. (2019). Replicator degrees of freedom allow publication of misleading failures to replicate. *Proceedings of the National Academy of Sciences, USA*, 116(51), 25535–25545. <https://doi.org/10.1038/s41562-021-01143-3>
- Bullock, O. M., & Shulman, H. C. (2020). Framing. In J. Bulck (Ed.), *The international encyclopedia of media psychology*. John Wiley & Sons. <https://doi.org/10.1002/9781119011071.iemp0268>
- Bullock, O. M., Shulman, H. C., & Huskey, R. (2021). Narratives are persuasive because they are easier to understand: Examining processing fluency as a mechanism of narrative persuasion. *Frontiers in Communication*, 188. <https://doi.org/10.3389/fcomm.2021.719615>
- Burgers, C., de Lavalette, K. Y. R., & Steen, G. J. (2018). Metaphor, hyperbole, and irony: Uses in isolation and in combination in written discourse. *Journal of Pragmatics*, 127, 71–83. <https://doi.org/10.1016/j.pragma.2018.01.009>
- Burgers, C., Konijn, E. A., & Steen, G. J. (2016). Figurative framing: Shaping public discourse through metaphor, hyperbole, and irony. *Communication Theory*, 26(4), 410–430. <https://doi.org/10.1111/comt.12096>
- Burgers, C., Konijn, E. A., Steen, G. J., & Iepson, M. A. (2015). Making ads less complex, yet more creative and persuasive: The effects of conventional metaphors and irony in print advertising. *International Journal of Advertising*, 34(3), 515–532. <https://doi.org/10.1080/02650487.2014.996200>
- Cacciatore, M. A., Scheufele, D. A., & Iyengar, S. (2016). The end of framing as we know it . . . and the future of media effects. *Mass Communication and Society*, 19(1), 7–23. <https://doi.org/10.1080/15205436.2015.1068811>
- Carmichael, L., Hogan, H. P., & Walter, A. A. (1932). An experimental study of the effect of language on the reproduction of visually perceived form. *Journal of Experimental Psychology*, 15(1), 73–86. <https://doi.org/10.1037/h0072671>
- Carpenter, C. J. (2012). A meta-analysis and an experiment investigating the effects of speaker disfluency on persuasion. *Western Journal of Communication*, 76(5), 552–569. <https://doi.org/10.1080/10570314.2012.662307>
- Casasanto, D. (2005). Crying “Whorf.” *Science*, 307(5716), 1721–1722. <https://doi.org/10.1126/science.307.5716.1721>
- Casasanto, D. (2008). Who’s afraid of the big bad Whorf? Crosslinguistic differences in temporal language and thought. *Language Learning*, 58(Suppl. 1), 63–79. <https://doi.org/10.1111/j.1467-9922.2008.00462.x>
- Casasanto, D. (2016). A shared mechanism of linguistic, cultural, and bodily relativity. *Language Learning*, 66(3), 714–730. <https://doi.org/10.1111/lang.12192>
- Chaiken, S. (1987). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), *Social influence: The Ontario symposium* (Vol. 5, pp. 3–39). Lawrence Erlbaum Associates.
- Chatruc, M. R., Stein, E., & Vlaicu, R. (2021). How issue framing shapes trade attitudes: Evidence from a multi-country survey experiment. *Journal of International Economics*, 129, Article 103428. <https://doi.org/10.1016/j.jinteco.2021.103428>
- Chen, M., & Bell, R. A. (2022). A meta-analysis of the impact of point of view on narrative processing and persuasion in health messaging. *Psychology & Health*, 37(5), 545–562. <https://doi.org/10.1080/08870446.2021.1894331>
- Chen, M. K. (2013). The effect of language on economic behavior: Evidence from savings rates, health behaviors, and retirement assets. *American Economic Review*, 103(2), 690–731. <https://doi.org/10.1257/aer.103.2.690>
- Cheng, F. F., Wu, C. S., & Lin, H. H. (2014). Reducing the influence of framing on internet consumers’ decisions: The role of elaboration. *Computers in Human Behavior*, 37, 56–63. <https://doi.org/10.1016/j.chb.2014.04.015>
- Cheng, H., Burns, C., & Revie, M. (2022). Risky-choice framing and its null effect on integral emotions. *Journal of Risk Research*, 25(4), 453–467. <https://doi.org/10.1080/13669877.2021.1936611>
- Chestnut, E. K., & Markman, E. M. (2018). “Girls are as good as boys at math” implies that boys are probably better: A study of expressions of gender equality. *Cognitive Science*, 42(7), 2229–2249. <https://doi.org/10.1111/cogs.12637>
- Chestnut, E. K., Zhang, M. Y., & Markman, E. M. (2021). “Just as good”: Learning gender stereotypes from attempts to counteract them. *Developmental Psychology*, 57(1), 114–125. <https://doi.org/10.1037/dev0001143>
- Chick, C. F., Reyna, V. F., & Corbin, J. C. (2016). Framing effects are robust to linguistic disambiguation: A critical test of contemporary theory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 42(2), 238–256. <https://doi.org/10.1037/xlm0000158>
- Chong, D., & Druckman, J. N. (2007). A theory of framing and opinion formation in competitive elite environments. *Journal of Communication*, 57(1), 99–118. [https://doi.org/10.1111/j.1460-2466.2006.00331\\_3.x](https://doi.org/10.1111/j.1460-2466.2006.00331_3.x)
- Chou, E. Y., & Murnighan, J. K. (2013). Life or death decisions: Framing the call for help. *PLOS ONE*, 8(3), Article e57351. <https://doi.org/10.1371/journal.pone.0057351>
- Christiansen, M. H., & Chater, N. (2022). *The language game: How improvisation created language and changed the world*. Basic Books.
- Christmann, U., & Göhring, A. L. (2016). A German-language replication study analysing the role of figurative speech in reasoning. *Scientific Data*, 3, Article 160098. <https://doi.org/10.1038/sdata.2016.98>
- Cialdini, R. B. (2001). The science of persuasion. *Scientific American*, 284(2), 76–81. <https://www.jstor.org/stable/26059056>
- Cimpian, A., & Markman, E. M. (2011). The generic/nongeneric distinction influences how children interpret new information about social others. *Child Development*, 82(2), 471–492. <https://doi.org/10.1111/j.1467-8624.2010.01525.x>

- Citron, F. M., & Goldberg, A. E. (2014). Metaphorical sentences are more emotionally engaging than their literal counterparts. *Journal of Cognitive Neuroscience*, *26*(11), 2585–2595. [https://doi.org/10.1162/jocn\\_a\\_00654](https://doi.org/10.1162/jocn_a_00654)
- Clark, H. H. (1969). Influence of language on solving three-term series problems. *Journal of Experimental Psychology*, *82*(2), 205–215. <https://doi.org/10.1037/h0028153>
- Clark, H. H. (1996). *Using language*. Cambridge University Press.
- Claus, B. (2022). Framing effects: Three linguistic accounts and experimental evidence. In R. Hörnig, S. von Wietersheim, A. Konietzko, & S. Featherston (Eds.), *Linguistic theory enriched by experimental data* (pp. 421–442). University of Tübingen.
- Claypool, H. M., Mackie, D. M., & Garcia-Marques, T. (2015). Fluency and attitudes. *Social and Personality Psychology Compass*, *9*(7), 370–382. <https://doi.org/10.1111/spc3.12179>
- Conner, M., & Norman, P. (2022). Understanding the intention-behavior gap: The role of intention strength. *Frontiers in Psychology*, *13*, Article 923464. <https://doi.org/10.3389/fpsyg.2022.923464>
- Constantino, S. M., Sparkman, G., Kraft-Todd, G. T., Bicchieri, C., Centola, D., Shell-Duncan, B., Vogt, S., & Weber, E. U. (2022). Scaling up change: A critical review and practical guide to harnessing social norms for climate action. *Psychological Science in the Public Interest*, *23*(2), 50–97. <https://doi.org/10.1177/15291006221105279>
- Corneille, O., Havemann, J., Henderson, E. L., IJzerman, H., Hussey, I., Orban de Xivry, J. J., Jussim, L., Holmes, N. P., Pilacinski, A., Beffara, B., Carroll, H., Outa, N. O., Lush, P., & Lotter, L. D. (2023). Point of view: Beware “persuasive communication devices” when writing and reading scientific articles. *eLife*, *12*, Article e88654. <https://doi.org/10.7554/eLife.88654>
- Costa, A., Foucart, A., Arnon, I., Aparici, M., & Apesteguia, J. (2014). “Piensa” twice: On the foreign language effect in decision making. *Cognition*, *130*(2), 236–254. <https://doi.org/10.1016/j.cognition.2013.11.010>
- Crano, W. D., & Prislin, R. (2006). Attitudes and persuasion. *Annual Review of Psychology*, *57*, 345–374. <https://doi.org/10.1146/annurev.psych.57.102904.190034>
- de Bruijn, H. (2019). *The art of political framing: How politicians convince us that they are right*. Amsterdam University Press.
- De Graaf, A., Sanders, J., & Hoeken, H. (2016). Characteristics of narrative interventions and health effects: A review of the content, form, and context of narratives in health-related narrative persuasion research. *Review of Communication Research*, *4*, 88–131. <https://doi.org/10.12840/issn.2255-4165.2016.04.01.011>
- DeJesus, J. M., Callanan, M. A., Solis, G., & Gelman, S. A. (2019). Generic language in scientific communication. *Proceedings of the National Academy of Sciences, USA*, *116*(37), 18370–18377. <https://doi.org/10.1073/pnas.1817706116>
- Del Maschio, N., Crespi, F., Peressotti, F., Abutalebi, J., & Sulpizio, S. (2022). Decision-making depends on language: A meta-analysis of the Foreign Language Effect. *Bilingualism: Language and Cognition*, *25*(4), 617–630. <https://doi.org/10.1017/S1366728921001012>
- De Martino, B., Kumaran, D., Seymour, B., & Dolan, R. J. (2006). Frames, biases, and rational decision-making in the human brain. *Science*, *313*(5787), 684–687. <https://doi.org/10.1126/science.1128356>
- de Oliveira, G. S., & Baggs, E. (2023). *Psychology's WEIRD problems*. Cambridge University Press.
- Dillard, J. P., & Nabi, R. L. (2006). The persuasive influence of emotion in cancer prevention and detection messages. *Journal of Communication*, *56*, S123–S139. <https://doi.org/10.1111/j.1460-2466.2006.00286.x>
- Dillard, J. P., & Seo, K. (2013). Affect and persuasion. In J. P. Dillard & L. Shen (Eds.), *The SAGE handbook of persuasion: Developments in theory and practice* (pp. 150–166). Sage.
- DiMaggio, P. (1997). Culture and cognition. *Annual Review of Sociology*, *23*(1), 263–287. <https://doi.org/10.1146/annurev.soc.23.1.263>
- Dolcos, S., & Albarracín, D. (2014). The inner speech of behavioral regulation: Intentions and task performance strengthen when you talk to yourself as a you. *European Journal of Social Psychology*, *44*(6), 636–642. <https://doi.org/10.1002/ejsp.2048>
- Dolscheid, S., Çelik, S., Erkan, H., Küntay, A., & Majid, A. (2020). Space-pitch associations differ in their susceptibility to language. *Cognition*, *196*, Article 104073. <https://doi.org/10.1016/j.cognition.2019.104073>
- Dolscheid, S., Shayan, S., Majid, A., & Casasanto, D. (2013). The thickness of musical pitch: Psychophysical evidence for linguistic relativity. *Psychological Science*, *24*(5), 613–621. <https://doi.org/10.1177/0956797612457374>
- Dor, D. (2015). *The instruction of imagination: Language as a social communication technology*. Oxford University Press.
- Druckman, J. N. (2001). On the limits of framing effects: Who can frame? *The Journal of Politics*, *63*(4), 1041–1066. <https://doi.org/10.1111/0022-3816.00100>
- Druckman, J. N., & McDermott, R. (2008). Emotion and the framing of risky choice. *Political Behavior*, *30*, 297–321. <https://doi.org/10.1007/s11109-008-9056-y>
- Druckman, J. N., & Nelson, K. R. (2003). Framing and deliberation: How citizens' conversations limit elite influence. *American Journal of Political Science*, *47*(4), 729–745. <https://doi.org/10.1111/1540-5907.00051>
- Dunegan, K. J. (1996). Fines, frames, and images: Examining formulation effects on punishment decisions. *Organizational Behavior and Human Decision Processes*, *68*(1), 58–67. <https://doi.org/10.1006/obhd.1996.0089>
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich College Publishers.
- Elliot, A. J., Eder, A. B., & Harmon-Jones, E. (2013). Approach-avoidance motivation and emotion: Convergence and divergence. *Emotion Review*, *5*(3), 308–311. <https://doi.org/10.1177/1754073913477517>
- Elliott, W. B., Rennekamp, K. M., & White, B. J. (2015). Does concrete language in disclosures increase willingness to invest? *Review of Accounting Studies*, *20*, 839–865. <https://doi.org/10.1007/s11142-014-9315-6>
- Elman, J. L. (2009). On the meaning of words and dinosaur bones: Lexical knowledge without a lexicon. *Cognitive*

- Science*, 33(4), 547–582. <https://doi.org/10.1111/j.1551-6709.2009.01023.x>
- Elmore, K. C., & Luna-Lucero, M. (2017). Light bulbs or seeds? How metaphors for ideas influence judgments about genius. *Social Psychological and Personality Science*, 8(2), 200–208. <https://doi.org/10.1177/1948550616667611>
- Enfield, N. J. (2022). *Language vs. reality: Why language is good for lawyers and bad for scientists*. MIT Press.
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51–58. <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- Epley, N., Mak, D., & Idson, L. C. (2006). Bonus of rebate? The impact of income framing on spending and saving. *Journal of Behavioral Decision Making*, 19(3), 213–227. <https://doi.org/10.1002/bdm.519>
- Evans, J. S. B. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, 59, 255–278. <https://doi.org/10.1146/annurev.psych.59.103006.093629>
- Evans, J. S. B., & Stanovich, K. E. (2013). Dual-process theories of higher cognition: Advancing the debate. *Perspectives on Psychological Science*, 8(3), 223–241. <https://doi.org/10.1177/1745691612460685>
- Evans, N., & Levinson, S. C. (2009). The myth of language universals: Language diversity and its importance for cognitive science. *Behavioral and Brain Sciences*, 32(5), 429–448. <https://doi.org/10.1017/S0140525X0999094X>
- Farrow, K., Grolleau, G., & Mzoughi, N. (2018). What in the word! The scope for the effect of word choice on economic behavior. *Kyklos*, 71(4), 557–580. <https://doi.org/10.1111/kykl.12186>
- Fausey, C. M., & Boroditsky, L. (2010). Subtle linguistic cues influence perceived blame and financial liability. *Psychonomic Bulletin & Review*, 17(5), 644–650. <https://doi.org/10.3758/PBR.17.5.644>
- Fausey, C. M., & Boroditsky, L. (2011). Who dunnit? Cross-linguistic differences in eye-witness memory. *Psychonomic Bulletin & Review*, 18, 150–157. <https://doi.org/10.3758/s13423-010-0021-5>
- Fausey, C. M., Long, B. L., Inamori, A., & Boroditsky, L. (2010). Constructing agency: The role of language. *Frontiers in Psychology*, 1, Article 162. <https://doi.org/10.3389/fpsyg.2010.00162>
- Fausey, C. M., & Matlock, T. (2011). Can grammar win elections? *Political Psychology*, 32(4), 563–574. <https://doi.org/10.1111/j.1467-9221.2010.00802.x>
- Fazio, R. H. (1986). How do attitudes guide behavior? In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (pp. 204–243). Guilford Press.
- Feinberg, M., & Willer, R. (2011). Apocalypse soon? Dire messages reduce belief in global warming by contradicting just-world beliefs. *Psychological Science*, 22(1), 34–38. <https://doi.org/10.1177/0956797610391911>
- Feinberg, M., & Willer, R. (2013). The moral roots of environmental attitudes. *Psychological Science*, 24(1), 56–62. <https://doi.org/10.1177/0956797612449177>
- Feinberg, M., & Willer, R. (2015). From gulf to bridge: When do moral arguments facilitate political influence? *Personality and Social Psychology Bulletin*, 41(12), 1665–1681. <https://doi.org/10.1177/0146167215607842>
- Feinberg, M., & Willer, R. (2019). Moral reframing: A technique for effective and persuasive communication across political divides. *Social and Personality Psychology Compass*, 13(12), Article e12501. <https://doi.org/10.1111/spc3.12501>
- Feygina, I., Jost, J. T., & Goldsmith, R. E. (2010). System justification, the denial of global warming, and the possibility of “system-sanctioned change.” *Personality and Social Psychology Bulletin*, 36(3), 326–338. <https://doi.org/10.1177/0146167209351435>
- Fillmore, C. J. (1982). Frame semantics. In Linguistic Society of Korea (Ed.), *Linguistics in the morning calm* (pp. 111–137). Hanshin Publishing Co.
- Fillmore, C. J. (2008). The merging of “frames.” In R. Rossini Favretti (Ed.), *Frames, corpora, and knowledge representation* (pp. 1–12). Bononia University Press.
- Fillmore, C. J., & Baker, C. (2009). A frames approach to semantic analysis. In B. Heine & H. Narrog (Eds.), *The Oxford handbook of linguistic analysis* (pp. 313–340). Oxford University Press.
- Fitzsimons, G. M., & Kay, A. C. (2004). Language and interpersonal cognition: Causal effects of variations in pronoun usage on perceptions of closeness. *Personality and Social Psychology Bulletin*, 30(5), 547–557. <https://doi.org/10.1177/0146167203262852>
- Flexas, A., López-Penadés, R., Aguilar-Mediavilla, E., & Adrover-Roig, D. (2023). Meanness trumps language: Lack of foreign language effect in early bilinguals’ moral choices. *PLOS ONE*, 18(11), Article e0294523. <https://doi.org/10.1371/journal.pone.0294523>
- Flusberg, S. J., DellaValle, M., & Thibodeau, P. H. (2023). How metaphor and political ideology shape lay theories of mental disorders. *Journal of Social & Clinical Psychology*, 42(4), 293–322. <https://doi.org/10.1521/jscp.2023.42.4.293>
- Flusberg, S. J., Lauria, M., Balko, S., & Thibodeau, P. H. (2020). Effects of communication modality and speaker identity on metaphor framing. *Metaphor & Symbol*, 35(2), 136–152. <https://doi.org/10.1080/10926488.2020.1767336>
- Flusberg, S. J., Mackey, A., & Semino, E. (2024). Seatbelts and raincoats, or banks and castles: Investigating the impact of vaccine metaphors. *PLOS ONE*, 19(1), Article e0294739. <https://doi.org/10.1371/journal.pone.0294739>
- Flusberg, S. J., Matlock, T., & Thibodeau, P. H. (2017). Metaphors for the war (or race) against climate change. *Environmental Communication*, 11(6), 769–783. <https://doi.org/10.1080/17524032.2017.1289111>
- Flusberg, S. J., Matlock, T., & Thibodeau, P. H. (2018). War metaphors in public discourse. *Metaphor & Symbol*, 33(1), 1–18. <https://doi.org/10.1080/10926488.2018.1407992>
- Flusberg, S. J., & Thibodeau, P. H. (2023). Why is mother earth on life support? Metaphors in environmental discourse. *Topics in Cognitive Science*, 15(3), 522–545. <https://doi.org/10.1111/tops.12651>
- Flusberg, S. J., Thibodeau, P. H., & Holmes, K. J. (2022). Even simple framing effects are rational. Commentary on

- Bermúdez. *Behavioral & Brain Sciences*, 45, Article e228. <https://doi.org/10.1017/S0140525X22000942>
- Flusberg, S. J., van der Vord, J., Husney, S. Q., & Holmes, K. J. (2022). Who's the "real" victim? How victim framing shapes attitudes toward sexual assault. *Psychological Science*, 33(4), 524–537. <https://doi.org/10.1177/09567976211045935>
- Franks, A. S., & Scherr, K. C. (2019). Economic issues are moral issues: The moral underpinnings of the desire to reduce wealth inequality. *Social Psychological and Personality Science*, 10(4), 553–562. <https://doi.org/10.1177/194855061877282>
- Freling, T. H., Vincent, L. H., & Henard, D. H. (2014). When not to accentuate the positive: Re-examining valence effects in attribute framing. *Organizational Behavior and Human Decision Processes*, 124(2), 95–109. <https://doi.org/10.1016/j.obhdp.2013.12.007>
- Freling, T. H., Yang, Z., Saini, R., Itani, O. S., & Abualsamh, R. R. (2020). When poignant stories outweigh cold hard facts: A meta-analysis of the anecdotal bias. *Organizational Behavior and Human Decision Processes*, 160, 51–67. <https://doi.org/10.1016/j.obhdp.2020.01.006>
- Frisch, D. (1993). Reasons for framing effects. *Organizational Behavior and Human Decision Processes*, 54(3), 399–429. <https://doi.org/10.1006/obhd.1993.1017>
- Gallagher, K. M., & Updegraff, J. A. (2012). Health message framing effects on attitudes, intentions, and behavior: A meta-analytic review. *Annals of Behavioral Medicine*, 43(1), 101–116. <https://doi.org/10.1007/s12160-012-9446-6>
- Gaucher, D., Friesen, J., & Kay, A. C. (2011). Evidence that gendered wording in job advertisements exists and sustains gender inequality. *Journal of Personality and Social Psychology*, 101(1), 109–128. <https://doi.org/10.1037/a0022530>
- Geiger, N., Dwyer, T., & Swim, J. K. (2023). Hopium or empowering hope? A meta-analysis of hope and climate engagement. *Frontiers in Psychology*, 14, Article 1139427. <https://doi.org/10.3389/fpsyg.2023.1139427>
- Gelman, S. A. (2021). Generics in society. *Language in Society*, 50(4), 517–532. <https://doi.org/10.1017/S0047404521000282>
- Gelman, S. A., & Heyman, G. D. (1999). Carrot-eaters and creature-believers: The effects of lexicalization on children's inferences about social categories. *Psychological Science*, 10(6), 489–493. <https://doi.org/10.1111/1467-9280.00194>
- Gelman, S. A., & Roberts, S. O. (2017). How language shapes the cultural inheritance of categories. *Proceedings of the National Academy of Sciences, USA*, 114(30), 7900–7907. <https://doi.org/10.1073/pnas.1621073114>
- Gentner, D. (1983). Structure-mapping: A theoretical framework for analogy. *Cognitive Science*, 7(2), 155–170. [https://doi.org/10.1016/S0364-0213\(83\)80009-3](https://doi.org/10.1016/S0364-0213(83)80009-3)
- Gentner, D., & Goldin-Meadow, S. (2003). Whither Whorf. In D. Gentner & S. Goldin-Meadow (Eds.), *Language in mind: Advances in the study of language and thought* (pp. 3–14). MIT Press.
- Gerber, A. S., Huber, G. A., Biggers, D. R., & Hendry, D. J. (2016). A field experiment shows that subtle linguistic cues might not affect voter behavior. *Proceedings of the National Academy of Sciences, USA*, 113(26), 7112–7117. <https://doi.org/10.1073/pnas.1513727113>
- Gerber, A. S., Huber, G. A., & Fang, A. (2018). Do subtle linguistic interventions priming a social identity as a voter have outsized effects on voter turnout? Evidence from a new replication experiment. *Political Psychology*, 39(4), 925–938. <https://doi.org/10.1111/pops.12446>
- Gerber, A. S., Huber, G. A., & Fang, A. H. (2023). Voting behavior is unaffected by subtle linguistic cues: Evidence from a psychologically authentic replication. *Behavioural Public Policy*, 7(2), 380–394. <https://doi.org/10.1017/bpp.2020.57>
- Gerend, M. A., & Shepherd, J. E. (2007). Using message framing to promote acceptance of the human papillomavirus vaccine. *Health Psychology*, 26(6), 745–752. <https://doi.org/10.1037/0278-6133.26.6.745>
- Gibbons, P., Busch, J., & Bradac, J. J. (1991). Powerful versus powerless language: Consequences for persuasion, impression formation, and cognitive response. *Journal of Language and Social Psychology*, 10(2), 115–133. <https://doi.org/10.1177/0261927X91102003>
- Gibbs, R. W. (2017). *Metaphor wars*. Cambridge University Press.
- Gigerenzer, G. (2018). The bias bias in behavioral economics. *Review of Behavioral Economics*, 5(3–4), 303–336. <https://doi.org/10.1561/105.00000092>
- Gleitman, L., & Papafragou, A. (2012). New perspectives on language and thought. In K. J. Holyoak & R. G. Morrison (Eds.), *The Oxford handbook of thinking and reasoning* (pp. 543–568). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199734689.013.0028>
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Harvard University Press.
- Goldschmied, N., Sheptock, M., Kim, K., & Galily, Y. (2017). Appraising Loftus and Palmer (2017) post-event information versus concurrent commentary in the context of sport. *Quarterly Journal of Experimental Psychology*, 70(11), 2347–2356. <https://doi.org/10.1080/17470218.2016.1237980>
- Goldstein, D. G., Hershfield, H. E., & Benartzi, S. (2016). The illusion of wealth and its reversal. *Journal of Marketing Research*, 53(5), 804–813. <https://doi.org/10.1509/jmr.14.0652>
- Goodman, N. D., & Frank, M. C. (2016). Pragmatic language interpretation as probabilistic inference. *Trends in Cognitive Sciences*, 20(11), 818–829. <https://doi.org/10.1016/j.tics.2016.08.005>
- Gourville, J. T. (1998). Pennies-a-day: The effect of temporal reframing on transaction evaluation. *Journal of Consumer Research*, 24(4), 395–408. <https://doi.org/10.1086/209517>
- Graesser, A. C., Millis, K. K., & Zwaan, R. A. (1997). Discourse comprehension. *Annual Review of Psychology*, 48(1), 163–189. <https://doi.org/10.1146/annurev.psych.48.1.163>
- Grice, H. P. (1975). Logic and conversation. In P. Cole & J. Morgan (Eds.), *Syntax and semantics* (Vol. 3, pp. 41–58). Academic Press.
- Grosjean, F. (2010). *Bilingual: Life and reality*. Harvard University Press.

- Guy, S., Kashima, Y., Walker, I., & O'Neill, S. (2013). Comparing the atmosphere to a bathtub: Effectiveness of analogy for reasoning about accumulation. *Climatic Change*, 121(4), 579–594. <https://doi.org/10.1007/s10584-013-0949-3>
- Hallahan, K. (1999). Seven models of framing: Implications for public relations. *Journal of Public Relations Research*, 11(3), 205–242. [https://doi.org/10.1207/s1532754xjpr1103\\_02](https://doi.org/10.1207/s1532754xjpr1103_02)
- Hamilton, M. A., Hunter, J. E., & Burgoon, M. (1990). An empirical test of an axiomatic model of the relationship between language intensity and persuasion. *Journal of Language and Social Psychology*, 9(4), 235–255. <https://doi.org/10.1177/0261927X9094002>
- Hanawalt, N. G., & Demarest, I. H. (1939). The effect of verbal suggestion in the recall period upon the reproduction of visually perceived forms. *Journal of Experimental Psychology*, 25(2), 159–174. <https://doi.org/10.1037/h0057682>
- 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. <https://doi.org/10.1177/0956797609355572>
- Harris, R. J. (1973). Answering questions containing marked and unmarked adjectives and adverbs. *Journal of Experimental Psychology*, 97(3), 399–401. <https://doi.org/10.1037/h0034165>
- Hart, C. (2021). Animals vs. armies: Resistance to extreme metaphors in anti-immigration discourse. *Journal of Language and Politics*, 20(2), 226–253. <https://doi.org/10.1075/jlp.20032.har>
- Hauser, D. J., & Schwarz, N. (2015). The war on prevention: Bellicose cancer metaphors hurt (some) prevention intentions. *Personality and Social Psychology Bulletin*, 41(1), 66–77. <https://doi.org/10.1177/0146167214557006>
- Hauser, D. J., & Schwarz, N. (2016). Semantic prosody and judgment. *Journal of Experimental Psychology: General*, 145(7), 882–896. <https://doi.org/10.1037/xge0000178>
- Hauser, D. J., & Schwarz, N. (2018). How seemingly innocuous words can bias judgment: Semantic prosody and impression formation. *Journal of Experimental Social Psychology*, 75, 11–18. <https://doi.org/10.1016/j.jesp.2017.10.012>
- Hauser, D. J., & Schwarz, N. (2020). The war on prevention II: Battle metaphors undermine cancer treatment and prevention and do not increase vigilance. *Health Communication*, 35(13), 1698–1704. <https://doi.org/10.1080/10410236.2019.1663465>
- Hauser, D. J., & Schwarz, N. (2023). Semantic prosody: How neutral words with collocational positivity/negativity color evaluative judgments. *Current Directions in Psychological Science*, 32(2), 98–104. <https://doi.org/10.1177/09637214221127978>
- Hauser, M. D., Chomsky, N., & Fitch, W. T. (2002). The faculty of language: What is it, who has it, and how did it evolve? *Science*, 298(5598), 1569–1579. <https://doi.org/10.1126/science.298.5598.1569>
- Hayakawa, S., Costa, A., Foucart, A., & Keysar, B. (2016). Using a foreign language changes our choices. *Trends in Cognitive Sciences*, 20(11), 791–793. <https://doi.org/10.1016/j.tics.2016.08.004>
- Hendricks, R. K., Demjén, Z., Semino, E., & Boroditsky, L. (2018). Emotional implications of metaphor: Consequences of metaphor framing for mindset about cancer. *Metaphor and Symbol*, 33(4), 267–279. <https://doi.org/10.1080/10926488.2018.1549835>
- Henrich, J., Heine, S., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33(2–3), 61–83. <https://doi.org/10.1017/S0140525X0999152X>
- Heritage, J., Robinson, J. D., Elliott, M. N., Beckett, M., & Wilkes, M. (2007). Reducing patients' unmet concerns in primary care: The difference one word can make. *Journal of General Internal Medicine*, 22, 1429–1433. <https://doi.org/10.1007/s11606-007-0279-0>
- Hershfield, H. E., Shu, S., & Benartzi, S. (2020). Temporal reframing and participation in a savings program: A field experiment. *Marketing Science*, 39(6), 1039–1051. <https://doi.org/10.1287/mksc.2019.1177>
- Hodgkinson, G. P., Bown, N. J., Maule, A. J., Glaister, K. W., & Pearman, A. D. (1999). Breaking the frame: An analysis of strategic cognition and decision making under uncertainty. *Strategic Management Journal*, 20(10), 977–985. [https://doi.org/10.1002/\(SICI\)1097-0266\(199910\)20:10<977::AID-SMJ58>3.0.CO;2-X](https://doi.org/10.1002/(SICI)1097-0266(199910)20:10<977::AID-SMJ58>3.0.CO;2-X)
- Hoewe, J. (2020). Toward a theory of media priming. *Annals of the International Communication Association*, 44(4), 312–321. <https://doi.org/10.1080/23808985.2020.1815232>
- Holmes, K. J., Doherty, E., & Flusberg, S. J. (2022). How and when does syntax perpetuate stereotypes? Probing the framing effects of subject-complement statements of equality. *Thinking & Reasoning*, 28(2), 226–260. <https://doi.org/10.1080/13546783.2021.1963841>
- Holmes, K. J., Flusberg, S. J., & Thibodeau, P. H. (2018). Compound words reflect cross-culturally shared bodily metaphors. *Cognitive Science*, 42(8), 3071–3082. <https://doi.org/10.1111/cogs.12671>
- Holmes, K. J., Kassin, L., Buchillon-Almeida, D., & Canseco-Gonzalez, E. (2024). *Linguistic distancing in emotion regulation: Evidence for cross-linguistically shared and language-specific signatures*. [Manuscript submitted for publication]. Department of Psychology, Reed College.
- Holmes, K. J., & Wolff, P. (2013). Spatial language and the psychological reality of schematization. *Cognitive Processing*, 14, 205–208. <https://doi.org/10.1007/s10339-013-0545-5>
- Holmes, K. J., Wu, S. H., Elpers, N., Doherty, E. M., & Flusberg, S. J. (2024). How syntax promotes stereotypes: Assessing the role of pragmatic inference [Manuscript submitted for publication]. Department of Psychology, Reed College.
- Holtgraves, T., & Lasky, B. (1999). Linguistic power and persuasion. *Journal of Language and Social Psychology*, 18(2), 196–205. <https://doi.org/10.1177/0261927X99018002004>
- Holyoak, K. J., & Stamenković, D. (2018). Metaphor comprehension: A critical review of theories and evidence. *Psychological Bulletin*, 144(6), 641–671. <https://psycnet.apa.org/doi/10.1037/bul0000145>
- Homar, A. R., & Cvelbar, L. K. (2021). The effects of framing on environmental decisions: A systematic literature

- review. *Ecological Economics*, 183, Article 106950. <https://doi.org/10.1016/j.ecolecon.2021.106950>
- Hommel, B., Pratt, J., Colzato, L., & Godijn, R. (2001). Symbolic control of visual attention. *Psychological Science*, 12(5), 360–365. <https://doi.org/10.1111/1467-9280.00367>
- Hornsey, M. J., & Fielding, K. S. (2016). A cautionary note about messages of hope: Focusing on progress in reducing carbon emissions weakens mitigation motivation. *Global Environmental Change*, 39, 26–34. <https://doi.org/10.1016/j.gloenvcha.2016.04.003>
- Hornsey, M. J., & Fielding, K. S. (2020). Understanding (and reducing) inaction on climate change. *Social Issues and Policy Review*, 14(1), 3–35. <https://doi.org/10.1111/sipr.12058>
- Hosman, L. A., & Siltanen, S. A. (2006). Powerful and powerless language forms: Their consequences for impression formation, attributions of control of self and control of others, cognitive responses, and message memory. *Journal of Language and Social Psychology*, 25(1), 33–46. <https://doi.org/10.1177/0261927X05284477>
- Howard, D. J., & Kerin, R. A. (2011). The effects of name similarity on message processing and persuasion. *Journal of Experimental Social Psychology*, 47(1), 63–71. <https://doi.org/10.1016/j.jesp.2010.08.008>
- Huette, S., Winter, B., Matlock, T., Ardell, D. H., & Spivey, M. (2014). Eye movements during listening reveal spontaneous grammatical processing. *Frontiers in Psychology*, 5, Article 410. <https://doi.org/10.3389/fpsyg.2014.00410>
- Huizenga, H. M., Zadelaar, J. N., Jansen, B. R. J., Olthof, M. C., Steingroever, H., Dekkers, L. M. S., van Duijvenvoorde, A. C. K., Figner, B., & Agelink van Rentergem, J. (2023). Formal models of differential framing effects in decision making under risk. *Decision*, 10(3), 197–234. <https://doi.org/10.1037/dec0000201>
- Hurst, K., & Stern, M. J. (2020). Messaging for environmental action: The role of moral framing and message source. *Journal of Environmental Psychology*, 68, Article 101394. <https://doi.org/10.1016/j.jenvp.2020.101394>
- Igou, E. R., & Bless, H. (2007). On undesirable consequences of thinking: Framing effects as a function of substantive processing. *Journal of Behavioral Decision Making*, 20(2), 125–142. <https://doi.org/10.1002/bdm.543>
- Inbar, Y., & Evers, E. (2022). Worse is bad: Divergent inferences from logically equivalent comparisons. *Journal of Experimental Psychology: General*, 151(3), 665–675. <https://doi.org/10.1037/xge0000804>
- Iyengar, S. (1991). *Is anyone responsible? How television frames political issues*. University of Chicago Press.
- January, D., & Kako, E. (2007). Re-evaluating evidence for linguistic relativity: Reply to Boroditsky (2001). *Cognition*, 104(2), 417–426. <https://doi.org/10.1016/j.cognition.2006.07.008>
- Johnson-Laird, P. N. (1983). *Mental models: Towards a cognitive science of language, inference, and consciousness*. Harvard University Press.
- Joshi, P. D., & Wakslak, C. J. (2014). Communicating with the crowd: Speakers use abstract messages when addressing larger audiences. *Journal of Experimental Psychology: General*, 143(1), 351–362. <https://doi.org/10.1037/a0032413>
- Joyal-Desmarais, K., Scharmer, A. K., Madzelan, M. K., See, J. V., Rothman, A. J., & Snyder, M. (2022). Appealing to motivation to change attitudes, intentions, and behavior: A systematic review and meta-analysis of 702 experimental tests of the effects of motivational message matching on persuasion. *Psychological Bulletin*, 148(7–8), 465–517. <https://doi.org/10.1037/bul0000377>
- Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.
- Kassin, L., Castellano, A., Canseco-Gonzalez, E., & Holmes, K. J. (2023, July 26–29). *Linguistic distancing and emotion regulation in English and Spanish* [Paper presentation]. 45th Annual Meeting of the Cognitive Science Society, Sydney, Australia.
- Keefer, L. A., Landau, M. J., Sullivan, D., & Rothschild, Z. K. (2014). Embodied metaphor and abstract problem solving: Testing a metaphorical fit hypothesis in the health domain. *Journal of Experimental Social Psychology*, 55, 12–20. <https://doi.org/10.1016/j.jesp.2014.05.012>
- Kellermann, K. (2007, September 27–30). *Persuasive question asking: How question wording influences answers* [Paper presentation]. Annual Meeting of the State Bar Association of California, Anaheim, CA, United States.
- Keysar, B., Hayakawa, S. L., & An, S. G. (2012). The foreign-language effect: Thinking in a foreign tongue reduces decision biases. *Psychological Science*, 23(6), 661–668. <https://doi.org/10.1177/0956797611432178>
- Kidwell, B., Farmer, A., & Hardesty, D. M. (2013). Getting liberals and conservatives to go green: Political ideology and congruent appeals. *Journal of Consumer Research*, 40(2), 350–367. <https://doi.org/10.1086/670610>
- Kim, H., Rao, A. R., & Lee, A. Y. (2009). It's time to vote: The effect of matching message orientation and temporal frame on political persuasion. *Journal of Consumer Research*, 35(6), 877–889. <https://doi.org/10.1086/593700>
- Kim, H. J., & Jang, J. M. (2018). The easier the better: How processing fluency influences self-efficacy and behavioral intention in pro-social campaign advertising. *Sustainability*, 10(12), 4777. <https://doi.org/10.3390/su10124777>
- Kintsch, W., & van Dijk, T. A. (1978). Toward a model of text comprehension and production. *Psychological Review*, 85(5), 363–394. <https://doi.org/10.1037/0033-295X.85.5.363>
- Kita, S., & Emmorey, K. (2023). Gesture links language and cognition for spoken and signed languages. *Nature Reviews Psychology*, 2, 407–420. <https://doi.org/10.1038/s44159-023-00186-9>
- Knowlton, T., Pietroski, P., Halberda, J., & Lidz, J. (2022). The mental representation of universal quantifiers. *Linguistics and Philosophy*, 45(4), 911–941. <https://doi.org/10.1007/s10988-021-09337-8>
- Krefeld-Schwab, A., Sugerman, E. R., & Johnson, E. J. (2024). Exposing omitted moderators: Explaining why effect sizes differ in the social sciences. *Proceedings of the National Academy of Sciences, USA*, 121(12), Article e2306281121. <https://doi.org/10.1073/pnas.2306281121>
- Kreiner, H., & Gamliel, E. (2018). The role of attention in attribute framing. *Journal of Behavioral Decision Making*, 31(3), 392–401. <https://doi.org/10.1002/bdm.2067>



- Kross, E., Bruehlman-Senecal, E., Park, J., Burson, A., Dougherty, A., Shablack, H., Bremner, R., Moser, J., & Ayduk, O. (2014). Self-talk as a regulatory mechanism: How you do it matters. *Journal of Personality and Social Psychology*, 106(2), 304–324. <https://doi.org/10.1037/a0035173>
- Kross, E., Vickers, B. D., Orvell, A., Gainsburg, I., Moran, T. P., Boyer, M., Jonides, J., Moser, J., & Ayduk, O. (2017). Third-person self-talk reduces Ebola worry and risk perception by enhancing rational thinking. *Applied Psychology: Health and Well-Being*, 9(3), 387–409. <https://doi.org/10.1111/aphw.12103>
- Kruglanski, A. W., & Thompson, E. P. (1999). Persuasion by a single route: A view from the unimodel. *Psychological Inquiry*, 10(2), 83–109. <https://doi.org/10.1207/S15327965PL100201>
- Kühberger, A. (1995). The framing of decisions: A new look at old problems. *Organizational Behavior and Human Decision Processes*, 62(2), 230–240. <https://doi.org/10.1006/obhd.1995.1046>
- Kühberger, A. (1998). The influence of framing on risky decisions: A meta-analysis. *Organizational Behavior and Human Decision Processes*, 75(1), 23–55. <https://doi.org/10.1006/obhd.1998.2781>
- Kühberger, A., & Tanner, C. (2010). Risky choice framing: Task versions and a comparison of prospect theory and fuzzy-trace theory. *Journal of Behavioral Decision Making*, 23(3), 314–329. <https://doi.org/10.1002/bdm.656>
- Laham, S. M., Koval, P., & Alter, A. L. (2012). The name-pronunciation effect: Why people like Mr. Smith more than Mr. Colquhoun. *Journal of Experimental Social Psychology*, 48(3), 752–756. <https://doi.org/10.1016/j.jesp.2011.12.002>
- Lakoff, G. (1987). *Women, fire, and dangerous things*. University of Chicago Press.
- Lakoff, G. (1996). *Moral politics: What conservatives know that liberals don't*. University of Chicago Press.
- Lakoff, G. (2008). *The political mind: A cognitive scientist's guide to your brain and its politics*. Penguin.
- Lakoff, G. (2010). Why it matters how we frame the environment. *Environmental Communication*, 4(1), 70–81. <https://doi.org/10.1080/17524030903529749>
- Lakoff, G. (2014). *The all new don't think of an elephant! Know your values and frame the debate*. Chelsea Green Publishing.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. University of Chicago Press.
- Lammers, J., Schulte, A., & Baldwin, M. (2023). Does framing climate change policies to fit with epistemic needs for predictability reduce conservatives' opposition? *Analyses of Social Issues and Public Policy*, 23(3), 571–591. <https://doi.org/10.1111/asap.12362>
- Landau, M. J., & Keefer, L. A. (2014). This is like that: Metaphors in public discourse shape attitudes. *Social and Personality Psychology Compass*, 8(8), 463–473. <https://doi.org/10.1111/spc3.12125>
- Landau, M. J., Keefer, L. A., & Rothschild, Z. K. (2014). Epistemic motives moderate the effect of metaphoric framing on attitudes. *Journal of Experimental Social Psychology*, 53, 125–138. <https://doi.org/10.1016/j.jesp.2014.03.009>
- 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(11), 1421–1427. <https://doi.org/10.1111/j.1467-9280.2009.02462.x>
- LeBoeuf, R. A., & Shafir, E. (2003). Deep thoughts and shallow frames: On the susceptibility to framing effects. *Journal of Behavioral Decision Making*, 16(2), 77–92. <https://doi.org/10.1002/bdm.433>
- Lecheler, S., & de Vreese, C. H. (2011). Getting real: The duration of framing effects. *Journal of Communication*, 61(5), 959–983. <https://doi.org/10.1111/j.1460-2466.2011.01580.x>
- Lecheler, S., & de Vreese, C. H. (2019). *News Framing effects: Theory and Practice*. Routledge.
- Lecheler, S., de Vreese, C. H., & Slothuus, R. (2009). Issue importance as a moderator of framing effects. *Communication Research*, 36(3), 400–425. <https://doi.org/10.1177/0093650209333028>
- Lecheler, S., Schuck, A. R., & De Vreese, C. H. (2013). Dealing with feelings: Positive and negative discrete emotions as mediators of news framing effects. *Communications*, 38(2), 189–209. <https://doi.org/10.1515/commun-2013-0011>
- Lee, A. Y., & Aaker, J. L. (2004). Bringing the frame into focus: The influence of regulatory fit on processing fluency and persuasion. *Journal of Personality and Social Psychology*, 86(2), 205–218. <https://doi.org/10.1037/0022-3514.86.2.205>
- Lee, S. J. (2019). The role of construal level in message effects research: A review and future directions. *Communication Theory*, 29(3), 319–338. <https://doi.org/10.1093/ct/qty030>
- Lenneberg, E. H. (1953). Cognition in ethnolinguistics. *Language*, 29(4), 463–471. <https://doi.org/10.2307/409956>
- Leong, L. M., McKenzie, C. R., Sher, S., & Müller-Trede, J. (2017). The role of inference in attribute framing effects. *Journal of Behavioral Decision Making*, 30(5), 1147–1156. <https://doi.org/10.1002/bdm.2030>
- Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgment and choice. *Cognition & Emotion*, 14(4), 473–493. <https://doi.org/10.1080/026999300402763>
- Lerner, J. S., Li, Y., Valdesolo, P., & Kassam, K. S. (2015). Emotion and decision making. *Annual Review of Psychology*, 66(1), 799–823. <https://doi.org/10.1146/annurev-psych-010213-115043>
- Levin, I. P. (1987). Associative effects of information framing. *Bulletin of the Psychonomic Society*, 25(2), 85–86. <https://doi.org/10.3758/BF03330291>
- 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. <https://doi.org/10.1086/209174>
- Levin, I. P., Gaeth, G. J., Schreiber, J., & Lauriola, M. (2002). A new look at framing effects: Distribution of effect sizes, individual differences, and independence of types of effects. *Organizational Behavior and Human Decision Processes*, 88(1), 411–429. <https://doi.org/10.1006/obhd.2001.2983>

- Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76(2), 149–188. <https://doi.org/10.1006/obhd.1998.2804>
- Li, N., & Su, L. Y. (2018). Message framing and climate change communication: A meta-analytical review. *Journal of Applied Communications*, 102(3). <https://doi.org/10.4148/1051-0834.2189>
- Li, P., & Gleitman, L. (2002). Turning the tables: Language and spatial reasoning. *Cognition*, 83(3), 265–294. [https://doi.org/10.1016/S0010-0277\(02\)00009-4](https://doi.org/10.1016/S0010-0277(02)00009-4)
- Lieberman, N., Trope, Y., & Stephan, E. (2007). Psychological distance. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (pp. 353–381). Guilford Press.
- Lipscomb, T. J., Bregman, N. J., & McAllister, H. A. (1985). A developmental inquiry into the effects of postevent information on eyewitness accounts. *The Journal of Genetic Psychology*, 146(4), 551–556. <https://doi.org/10.1080/00221325.1985.10532475>
- Lipscomb, T. J., McAllister, H. A., & Bregman, N. J. (1985). Bias in eyewitness accounts: The effects of question format, delay interval, and stimulus presentation. *The Journal of Psychology*, 119(3), 207–212. <https://doi.org/10.1080/00223980.1985.10542888>
- Liu, C., Wang, H., Timmer, K., & Jiao, L. (2022). The foreign language effect on altruistic decision making: Insights from the framing effect. *Bilingualism: Language and Cognition*, 25(5), 890–898. <https://doi.org/10.1017/S1366728922000128>
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127(2), 267–286. <https://doi.org/10.1037/0033-2909.127.2.267>
- Loftus, E. F. (1975). Leading questions and the eyewitness report. *Cognitive Psychology*, 7(4), 560–572. [https://doi.org/10.1016/0010-0285\(75\)90023-7](https://doi.org/10.1016/0010-0285(75)90023-7)
- Loftus, E. F. (1979). *Eyewitness testimony*. Harvard University Press.
- Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of Verbal Learning and Verbal Behavior*, 13(5), 585–589. [https://doi.org/10.1016/S0022-5371\(74\)80011-3](https://doi.org/10.1016/S0022-5371(74)80011-3)
- Loftus, E. F., & Zanni, G. (1975). Eyewitness testimony: The influence of the wording of a question. *Bulletin of the Psychonomic Society*, 5(1), 86–88. <https://doi.org/10.3758/BF03336715>
- Logan, G. D. (1995). Linguistic and conceptual control of visual spatial attention. *Cognitive Psychology*, 28(2), 103–174. <https://doi.org/10.1006/cogp.1995.1004>
- Loschelder, D. D., Siepelmeyer, H., Fischer, D., & Rubel, J. A. (2019). Dynamic norms drive sustainable consumption: Norm-based nudging helps café customers to avoid disposable to-go-cups. *Journal of Economic Psychology*, 75, 102146. <https://doi.org/10.1016/j.joep.2019.02.002>
- Luntz, F. (2007). *Words that work: It's not what you say, it's what people hear*. Hachette UK.
- Lupyan, G. (2008). From chair to “chair”: A representational shift account of object labeling effects on memory. *Journal of Experimental Psychology: General*, 137(2), 348–369. <https://doi.org/10.1037/0096-3445.137.2.348>
- Lupyan, G., Rahman, R. A., Boroditsky, L., & Clark, A. (2020). Effects of language on visual perception. *Trends in Cognitive Sciences*, 24(11), 930–944. <https://doi.org/10.1016/j.tics.2020.08.005>
- Lupyan, G., & Spivey, M. J. (2010a). Making the invisible visible: Verbal but not visual cues enhance visual detection. *PLOS ONE*, 5(7), Article e11452. <https://doi.org/10.1371/journal.pone.0011452>
- Lupyan, G., & Spivey, M. J. (2010b). Redundant spoken labels facilitate perception of multiple items. *Attention, Perception, & Psychophysics*, 72(8), 2236–2253. <https://doi.org/10.3758/BF03196698>
- Lupyan, G., & Ward, E. J. (2013). Language can boost otherwise unseen objects into visual awareness. *Proceedings of the National Academy of Sciences, USA*, 110(35), 14196–14201. <https://doi.org/10.1073/pnas.1303312110>
- Lupyan, G., & Winter, B. (2018). Language is more abstract than you think, or, why aren't languages more iconic? *Philosophical Transactions of the Royal Society B: Biological Sciences*, 373(1752), 20170137. <https://doi.org/10.1098/rstb.2017.0137>
- Macnamara, B. N., & Burgoyne, A. P. (2023). Do growth mindset interventions impact students' academic achievement? A systematic review and meta-analysis with recommendations for best practices. *Psychological Bulletin*, 149(3–4), 133–173. <https://doi.org/10.1037/bul0000352>
- Magaña, D., & Matlock, T. (2018). How Spanish speakers use metaphor to describe their experiences with cancer. *Discourse & Communication*, 12(6), 627–644. <https://doi.org/10.1177/1750481318771446>
- Mahoney, K. T., Buboltz, W., Levin, I. P., Doverspike, D., & Svyantek, D. J. (2011). Individual differences in a within-subjects risky-choice framing study. *Personality and Individual Differences*, 51(3), 248–257. <https://doi.org/10.1016/j.paid.2010.03.035>
- Maiella, R., La Malva, P., Marchetti, D., Pomarico, E., Di Crosta, A., Palumbo, R., Cetara, L., Di Domenico, A., & Verrocchio, M. C. (2020). The psychological distance and climate change: A systematic review on the mitigation and adaptation behaviors. *Frontiers in Psychology*, 11, Article 568899. <https://doi.org/10.3389/fpsyg.2020.568899>
- Malik-Moraleta, S., Ayyash, D., Gallée, J., Affourtit, J., Hoffmann, M., Mineroff, Z., Jouravlev, O., & Fedorenko, E. (2022). An investigation across 45 languages and 12 language families reveals a universal language network. *Nature Neuroscience*, 25(8), 1014–1019. <https://doi.org/10.1038/s41593-022-01114-5>
- Malt, B. C., & Majid, A. (2013). How thought is mapped into words. *Wiley Interdisciplinary Reviews: Cognitive Science*, 4(6), 583–597. <https://doi.org/10.1002/wcs.1251>
- Mandel, D. R. (2001). Gain-loss framing and choice: Separating outcome formulations from descriptor formulations. *Organizational Behavior and Human Decision Processes*, 85(1), 56–76. <https://doi.org/10.1006/obhd.2000.2932>

- Mandel, D. R. (2014). Do framing effects reveal irrational choice? *Journal of Experimental Psychology: General*, 143(3), 1185–1198. <https://doi.org/10.1037/a0034207>
- Mandel, D. R., & Kapler, I. V. (2018). Cognitive style and frame susceptibility in decision-making. *Frontiers in Psychology*, 9, Article 1461. <https://doi.org/10.3389/fpsyg.2018.01461>
- Mandler, J. M. (2014). *Stories, scripts, and scenes: Aspects of schema theory*. Psychology Press.
- Mantonakis, A., Rodero, P., Lesschaeve, I., & Hastie, R. (2009). Order in choice: Effects of serial position on preferences. *Psychological Science*, 20(11), 1309–1312. <https://doi.org/10.1111/j.1467-9280.2009.02453.x>
- Markowitz, D. M., & Shulman, H. C. (2021). The predictive utility of word familiarity for online engagements and funding. *Proceedings of the National Academy of Sciences, USA*, 118(18), Article e2026045118. <https://doi.org/10.1073/pnas.2026045118>
- Martí, L., Wu, S., Piantadosi, S. T., & Kidd, C. (2023). Latent diversity in human concepts. *Open Mind*, 7, 79–92. [https://doi.org/10.1162/opmi\\_a\\_00072](https://doi.org/10.1162/opmi_a_00072)
- Matlock, T. (2011). The conceptual motivation of aspect. In K. Panther & G. Radden (Eds.), *Motivation in grammar and the lexicon* (pp. 133–147). John Benjamins. <https://doi.org/10.1075/hcp.27.09mat>
- Matlock, T. (2012). Framing political messages with grammar and metaphor. *American Scientist*, 100(6), 478–483.
- Matlock, T., Sparks, D., Matthews, J. L., Hunter, J., & Huette, S. (2012). Smashing new results on aspectual framing: How people describe car accidents. *Studies in Language*, 36(3), 700–721. <https://doi.org/10.1075/sl.36.3.09mat>
- Mayer, N. D., & Tormala, Z. L. (2010). “Think” versus “feel” framing effects in persuasion. *Personality and Social Psychology Bulletin*, 36(4), 443–454. <https://doi.org/10.1177/0146167210362981>
- McAllister, H. A., Bregman, N. J., & Lipscomb, T. J. (1988). Speed estimates by eyewitnesses and earwitnesses: How vulnerable to postevent information? *The Journal of General Psychology*, 115(1), 25–35. <https://doi.org/10.1080/00221309.1988.9711085>
- McCloskey, M., & Zaragoza, M. (1985). Misleading postevent information and memory for events: Arguments and evidence against memory impairment hypotheses. *Journal of Experimental Psychology: General*, 114(1), 1–16. <https://doi.org/10.1037/0096-3445.114.1.1>
- McDonald, K., Graves, R., Yin, S., Weese, T., & Sinnott-Armstrong, W. (2021). Valence framing effects on moral judgments: A meta-analysis. *Cognition*, 212, Article 104703. <https://doi.org/10.1016/j.cognition.2021.104703>
- McElroy, T., & Seta, J. J. (2003). Framing effects: An analytic-holistic perspective. *Journal of Experimental Social Psychology*, 39(6), 610–617. [https://doi.org/10.1016/S0022-1031\(03\)00036-2](https://doi.org/10.1016/S0022-1031(03)00036-2)
- McKenzie, C. R. M., & Nelson, J. (2003). What a speaker’s choice of frame reveals: Reference points, frame selection, and framing effects. *Psychonomic Bulletin & Review*, 10(3), 596–602. <https://doi.org/10.3758/BF03196520>
- McNeil, B. J., Pauker, S. G., Sox, H. C., & Tversky, A. (1982). On the elicitation of preferences for alternative therapies. *New England Journal of Medicine*, 306(21), 1259–1262. <https://doi.org/10.1056/NEJM198205273062103>
- Meissner, C. A., & Brigham, J. C. (2001). A meta-analysis of the verbal overshadowing effect in face identification. *Applied Cognitive Psychology*, 15(6), 603–616. <https://doi.org/10.1002/acp.728>
- Melcher, J. M., & Schooler, J. W. (1996). The misremembrance of wines past: Verbal and perceptual expertise differentially mediate verbal overshadowing of taste memory. *Journal of Memory and Language*, 35(2), 231–245. <https://doi.org/10.1006/jmla.1996.0013>
- Meyerowitz, B. E., & Chaiken, S. (1987). The effect of message framing on breast self-examination attitudes, intentions, and behavior. *Journal of Personality and Social Psychology*, 52(3), 500–510. <https://doi.org/10.1037/0022-3514.52.3.500>
- Minsky, M. (1974). *A framework for representing knowledge (MIT-AI Laboratory Memo 306)*. MIT Artificial Intelligence Laboratory.
- Minson, J. A., & Chen, F. S. (2022). Receptiveness to opposing views: Conceptualization and integrative review. *Personality and Social Psychology Review*, 26(2), 93–111. <https://doi.org/10.1177/10888683211061037>
- Mon, S. K., Nenchewa, M., Citron, F. M., Lew-Williams, C., & Goldberg, A. E. (2021). Conventional metaphors elicit greater real-time engagement than literal paraphrases or concrete sentences. *Journal of Memory and Language*, 121, Article 104285. <https://doi.org/10.1016/j.jml.2021.104285>
- Moray, N. (1959). Attention in dichotic listening: Affective cues and the influence of instructions. *Quarterly Journal of Experimental Psychology*, 11, 56–60. <https://doi.org/10.1080/17470215908416289>
- Morris, B. S., Chrysochou, P., Christensen, J. D., Orquin, J. L., Barraza, J., Zak, P. J., & Mitkidis, P. (2019). Stories vs. facts: Triggering emotion and action-taking on climate change. *Climatic Change*, 154, 19–36. <https://doi.org/10.1007/s10584-019-02425-6>
- Moty, K., & Rhodes, M. (2021). The unintended consequences of the things we say: What generic statements communicate to children about unmentioned categories. *Psychological Science*, 32(2), 189–203. <https://doi.org/10.1177/0956797620953132>
- Moyer-Gusé, E., & Nabi, R. L. (2010). Explaining the effects of narrative in an entertainment television program: Overcoming resistance to persuasion. *Human Communication Research*, 36(1), 26–52. <https://doi.org/10.1111/j.1468-2958.2009.01367.x>
- Nabi, R. L. (1999). A cognitive-functional model for the effects of discrete negative emotions on information processing, attitude change, and recall. *Communication Theory*, 9(3), 292–320. <https://doi.org/10.1111/j.1468-2885.1999.tb00172.x>
- Nabi, R. L. (2002a). Anger, fear, uncertainty, and attitudes: A test of the cognitive-functional model. *Communication Monographs*, 69(3), 204–216. <https://doi.org/10.1080/03637750216541>
- Nabi, R. L. (2002b). Discrete emotions and persuasion. In J. P. Dillard & M. Pfau (Eds.), *The persuasion handbook: Developments in theory and practice* (pp. 289–308). Sage.
- Nabi, R. L. (2003). Exploring the framing effects of emotion: Do discrete emotions differentially influence information accessibility, information seeking, and policy preference?

- Communication Research*, 30(2), 224–247. <https://doi.org/10.1177/0093650202250881>
- Nabi, R. L. (2010). The case for emphasizing discrete emotions in communication research. *Communication Monographs*, 77(2), 153–159. <https://doi.org/10.1080/03637751003790444>
- Nabi, R. L., & Green, M. C. (2015). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology*, 18(2), 137–162. <https://doi.org/10.1080/15213269.2014.912585>
- Nabi, R. L., Gustafson, A., & Jensen, R. (2018). Framing climate change: Exploring the role of emotion in generating advocacy behavior. *Science Communication*, 40(4), 442–468. <https://doi.org/10.1177/1075547018776019>
- 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. <https://doi.org/10.1177/0093650219861256>
- Nath, L., Pedriana, N., Gifford, C., McAuley, J. W., & Fülöp, M. (2022). Examining moral foundations theory through immigration attitudes. *Athens Journal of Social Science*, 9(1), 9–30. <https://doi.org/10.30958/ajss.9-1-1>
- Nedergaard, J. S., Wallentin, M., & Lupyan, G. (2023). Verbal interference paradigms: A systematic review investigating the role of language in cognition. *Psychonomic Bulletin & Review*, 30(2), 464–488. <https://doi.org/10.3758/s13423-022-02144-7>
- Nelson, T. E., Clawson, R. A., & Oxley, Z. M. (1997). Media framing of a civil liberties conflict and its effect on tolerance. *American Political Science Review*, 91(3), 567–583. <https://doi.org/10.2307/2952075>
- Nelson, T. E., & Kinder, D. R. (1996). Issue frames and group-centrism in American public opinion. *The Journal of Politics*, 58(4), 1055–1078. <https://doi.org/10.2307/2960149>
- Nelson, T. E., & Oxley, Z. M. (1999). Issue framing effects on belief importance and opinion. *The Journal of Politics*, 61(4), 1040–1067. <https://doi.org/10.2307/2647553>
- Nelson, T. E., Oxley, Z. M., & Clawson, R. A. (1997). Toward a psychology of framing effects. *Political Behavior*, 19, 221–246. <https://doi.org/10.1023/A:1024834831093>
- Newman, E. J., Sanson, M., Miller, E. K., Quigley-McBride, A., Foster, J. L., Bernstein, D. M., & Garry, M. (2014). People with easier to pronounce names promote truthiness of claims. *PLOS ONE*, 9(2), Article e88671. <https://doi.org/10.1371/journal.pone.0088671>
- Nook, E. C., Schleider, J. L., & Somerville, L. H. (2017). A linguistic signature of psychological distancing in emotion regulation. *Journal of Experimental Psychology: General*, 146(3), 337–346. <https://doi.org/10.1037/xge0000263>
- Nook, E. C., Vidal Bustamante, C. M., Cho, H. Y., & Somerville, L. H. (2020). Use of linguistic distancing and cognitive reappraisal strategies during emotion regulation in children, adolescents, and young adults. *Emotion*, 20(4), 525–540. <https://doi.org/10.1037/emo0000570>
- Novoa, G., Echelbarger, M., Gelman, A., & Gelman, S. A. (2023). Generically partisan: Polarization in political communication. *Proceedings of the National Academy of Sciences, USA*, 120(47), Article e2309361120. <https://doi.org/10.1073/pnas.2309361120>
- Noyes, A., & Keil, F. C. (2019). Generics designate kinds but not always essences. *Proceedings of the National Academy of Sciences, USA*, 116(41), 20354–20359. <https://doi.org/10.1073/pnas.190010511>
- Oganian, Y., Korn, C. W., & Heekeren, H. R. (2016). Language switching—but not foreign language use per se—reduces the framing effect. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 42(1), 140–148. <https://doi.org/10.1037/xlm0000161>
- O'Keefe, D. J. (2017a). Message framing variations in health and risk messaging. In M. Powers (Ed.), *Oxford research encyclopedia of communication*. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190228613.013.308>
- O'Keefe, D. J. (2017b). Misunderstandings of effect sizes in message effects research. *Communication Methods and Measures*, 11(3), 210–219. <https://doi.org/10.1080/19312458.2017.1343812>
- O'Keefe, D. J., & Hoeken, H. (2021). Message design choices don't make much difference to persuasiveness and can't be counted on—not even when moderating conditions are specified. *Frontiers in Psychology*, 12, Article 664160. <https://doi.org/10.3389/fpsyg.2021.664160>
- O'Keefe, D. J., & Jensen, J. D. (2006). The advantages of compliance or the disadvantages of noncompliance? A meta-analytic review of the relative persuasive effectiveness of gain-framed and loss-framed messages. *Annals of the International Communication Association*, 30(1), 1–43. <https://doi.org/10.1080/23808985.2006.11679054>
- O'Keefe, D. J., & Jensen, J. D. (2007). The relative persuasiveness of gain-framed loss-framed messages for encouraging disease prevention behaviors: A meta-analytic review. *Journal of Health Communication*, 12(7), 623–644. <https://doi.org/10.1080/10810730701615198>
- O'Keefe, D. J., & Jensen, J. D. (2009). The relative persuasiveness of gain-framed and loss-framed messages for encouraging disease detection behaviors: A meta-analytic review. *Journal of Communication*, 59(2), 296–316. <https://doi.org/10.1111/j.1460-2466.2009.01417.x>
- O'Keefe, D. J., & Jensen, J. D. (2015). The relative effectiveness of gain-framed and loss-framed persuasive appeals concerning obesity-related behaviors: Meta-analytic evidence and implications. In R. Batra, V. J. Strecher, & P. A. Keller (Eds.), *Leveraging consumer psychology for effective health communications: The obesity challenge* (pp. 171–185). Routledge.
- O'Keefe, D. J., & Wu, D. (2012). Gain-framed messages do not motivate sun protection: A meta-analytic review of randomized trials comparing gain-framed and loss-framed appeals for promoting skin cancer prevention. *International Journal of Environmental Research and Public Health*, 9(6), 2121–2133. <https://doi.org/10.3390/ijerph9062121>
- Okuhara, T., Ishikawa, H., Okada, M., Kato, M., & Kiuchi, T. (2017). Designing persuasive health materials using processing fluency: A literature review. *BMC Research Notes*, 10(1), Article 198. <https://doi.org/10.1186/s13104-017-2524-x>
- Ommundsen, R., Larsen, K. S., van der Veer, K., & Eilertsen, D. E. (2014). Framing unauthorized immigrants: The effects of labels on evaluations. *Psychological Reports*, 114(2), 461–478. <https://doi.org/10.2466/17.PR0.114k20w0>

- Oppenheimer, D. M. (2006). Consequences of erudite vernacular utilized irrespective of necessity: Problems with using long words needlessly. *Applied Cognitive Psychology, 20*(2), 139–156. <https://doi.org/10.1002/acp.1178>
- Oppenheimer, D. M. (2008). The secret life of fluency. *Trends in Cognitive Sciences, 12*(6), 237–241. <https://doi.org/10.1016/j.tics.2008.02.014>
- Orvell, A., Gelman, S. A., & Kross, E. (2022). What “you” and “we” say about me: How small shifts in language reveal and empower fundamental shifts in perspective. *Social and Personality Psychology Compass, 16*(5), Article e12665. <https://doi.org/10.1111/spc3.12665>
- Orvell, A., Kross, E., & Gelman, S. A. (2017). How “you” makes meaning. *Science, 355*(6331), 1299–1302. <https://doi.org/10.1126/science.aaj2014>
- Orvell, A., Kross, E., & Gelman, S. A. (2020). “You” speaks to me: Effects of generic-you in creating resonance between people and ideas. *Proceedings of the National Academy of Sciences, USA, 117*(49), 31038–31045. <https://doi.org/10.1073/pnas.2010939117>
- Oschatz, C., & Marker, C. (2020). Long-term persuasive effects in narrative communication research: A meta-analysis. *Journal of Communication, 70*(4), 473–496. <https://doi.org/10.1093/joc/jqaa017>
- Ottati, V. C., & Renstrom, R. A. (2010). Metaphor and persuasive communication: A multifunctional approach. *Social and Personality Psychology Compass, 4*(9), 783–794. <https://doi.org/10.1111/j.1751-9004.2010.00292.x>
- Ottati, V. C., Rhoads, S., & Graesser, A. (1999). The effect of metaphor on processing style in a persuasion task: A motivational resonance model. *Journal of Personality and Social Psychology, 77*(4), 688–697. <https://doi.org/10.1037/0022-3514.77.4.688>
- Packard, G., Berger, J., & Boghrati, R. (2023). How verb tense shapes persuasion. *Journal of Consumer Research, 50*(3), 645–660. <https://doi.org/10.1093/jcr/ucad006>
- Perloff, R. M. (2017). *Dynamics of persuasion: Communication and attitudes in the twenty-first century*. Routledge.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In *Communication and persuasion* (pp. 1–24). Springer.
- Pickering, M. J., & Gambi, C. (2018). Predicting while comprehending language: A theory and review. *Psychological Bulletin, 144*(10), 1002–1044. <https://doi.org/10.1037/bul0000158>
- Pinker, S. (1994). *The language instinct: How the mind creates language*. HarperCollins.
- Pinker, S. (2007). *The stuff of thought: Language as a window into human nature*. Penguin.
- Piñon, A., & Gambará, H. (2005). A meta-analytic review of framing effect: Risky, attribute and goal framing. *Psicothema, 17*(2), 325–331.
- Powell, T. E., Boomgard, H. G., De Swert, K., & De Vreese, C. H. (2015). A clearer picture: The contribution of visuals and text to framing effects. *Journal of Communication, 65*(6), 997–1017. <https://doi.org/10.1111/jcom.12184>
- Pratkanis, A. R., & Aronson, E. (1991). *Age of propaganda: The everyday use and abuse of persuasion*. Macmillan.
- Rapp, C. (2022). Aristotle’s rhetoric. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Spring 2022 ed.). Stanford University. <https://plato.stanford.edu/archives/spr2022/entries/aristotle-rhetoric>
- Ratcliff, C. L., & Sun, Y. (2020). Overcoming resistance through narratives: Findings from a meta-analytic review. *Human Communication Research, 46*(4), 412–443. <https://doi.org/10.1093/hcr/hqz017>
- Read, J. D., Barnsley, R. H., Ankers, K., & Wishaw, I. Q. (1978). Variations in severity of verbs and eyewitnesses’ testimony: An alternative interpretation. *Perceptual and Motor Skills, 46*(3), 795–800. <https://doi.org/10.2466/pms.1978.46.3.79>
- Read, J. D., & Bruce, D. (1984). On the external validity of questioning effects in eyewitness testimony. *Applied Psychology, 33*(1), 33–49. <https://doi.org/10.1111/j.1464-0597.1984.tb01415.x>
- Read, S. J., Cesa, I. L., Jones, D. K., & Collins, N. L. (1990). When is the federal budget like a baby? Metaphor in political rhetoric. *Metaphor and Symbol, 5*(3), 125–149. [https://doi.org/10.1207/s15327868ms0503\\_1](https://doi.org/10.1207/s15327868ms0503_1)
- Reali, F., Spivey, M. J., Tyler, M. J., & Terranova, J. (2006). Inefficient conjunction search made efficient by concurrent spoken delivery of target identity. *Perception & Psychophysics, 68*, 959–974. <https://doi.org/10.3758/BF03193358>
- Reddy, M. (1979). The conduit metaphor. In A. Ortony (Ed.), *Metaphor and thought* (pp. 285–324). Cambridge University Press.
- Rhodes, M., Leslie, S. J., & Tworek, C. M. (2012). Cultural transmission of social essentialism. *Proceedings of the National Academy of Sciences, USA, 109*(34), 13526–13531. <https://doi.org/10.1073/pnas.12089511109>
- Riou, M., Ball, S., Williams, T. A., Whiteside, A., O’halloran, K. L., Bray, J., Perkins, G. D., Smith, K., Cameron, P., Fatovich, D. M., Inoue, M., Bailey, P., Brink, D., & Finn, J. (2017). ‘Tell me exactly what’s happened’: When linguistic choices affect the efficiency of emergency calls for cardiac arrest. *Resuscitation, 117*, 58–65. <https://doi.org/10.1016/j.resuscitation.2017.06.002>
- Roberts, S. G., Winters, J., & Chen, K. (2015). Future tense and economic decisions: Controlling for cultural evolution. *PLOS ONE, 10*(7), Article e0132145. <https://doi.org/10.1371/journal.pone.0132145>
- Rogers, T. T., & McClelland, J. L. (2004). *Semantic cognition: A parallel distributed processing approach*. MIT Press.
- Rook, E. D., & Holmes, K. J. (2023). How language shapes anti-fat bias: Comparing the effects of disease and fat-rights framing. *Frontiers in Communication, 8*, Article 1284074. <https://doi.org/10.3389/fcomm.2023.1284074>
- Rosch, E. (1983). Prototype classification and logical classification: The two systems. In E. F. Scholnick (Ed.), *New trends in conceptual representation: Challenges to Piaget’s theory* (pp. 73–86). Lawrence Erlbaum Associates.
- Roskos-Ewoldsen, D. R., & Roskos-Ewoldsen, B. (2009). Media priming: An updated synthesis. In J. Bryant & M. B. Oliver (Eds.), *Media effects* (pp. 90–109). Routledge.
- Rothman, A. J., Desmarais, K. J., & Lenne, R. L. (2020). Moving from research on message framing to principles of message matching: The use of gain-and loss-framed messages to promote healthy behavior. *Advances in Motivation Science, 7*, 43–73. <https://doi.org/10.1016/bs.adms.2019.03.001>

- 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. <https://doi.org/10.1177/1368430218818744>
- Rumelhart, D. E. (1975). Notes on a schema for stories. In D. G. Bobrow & A. Collins (Eds.), *Representation and understanding: Studies in cognitive science* (pp. 211–236). Morgan Kaufmann. <https://doi.org/10.1016/B978-0-12-108550-6.50013-6>
- Ruppenhofer, J., Ellsworth, M., Petruck, M. R., Johnson, C. R., & Scheffczyk, J. (2016). *FrameNet II: Extended theory and practice*. International Computer Science Institute.
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, 110(1), 145–172. <https://doi.org/10.1037/0033-295X.110.1.145>
- Sahni, N. S., Wheeler, S. C., & Chintagunta, P. (2018). Personalization in email marketing: The role of noninformative advertising content. *Marketing Science*, 37(2), 236–258. <https://doi.org/10.1287/mksc.2017.1066>
- Schacter, D. L., & Buckner, R. L. (1998). Priming and the brain. *Neuron*, 20(2), 185–195. [https://doi.org/10.1016/S0896-6273\(00\)80448-1](https://doi.org/10.1016/S0896-6273(00)80448-1)
- Schaffner, B. F., & Atkinson, M. L. (2009). Taxing death or estates? When frames influence citizens' issue beliefs. In B. F. Schaffner & P. J. Sellers (Eds.), *Winning with words: The origins & impact of political framing* (pp. 121–135). Routledge.
- Schank, R. C., & Abelson, R. P. (1977). *Scripts, plans, goals, and understanding: An inquiry into human knowledge structures*. Psychology Press.
- Schmidt, L., Skvortsova, V., Kullen, C., Weber, B., & Plassmann, H. (2017). How context alters value: The brain's valuation and affective regulation system link price cues to experienced taste pleasantness. *Scientific Reports*, 7, Article 8098. <https://doi.org/10.1038/s41598-017-08080-0>
- Schooler, J. W., & Engstler-Schooler, T. Y. (1990). Verbal overshadowing of visual memories: Some things are better left unsaid. *Cognitive Psychology*, 22(1), 36–71. [https://doi.org/10.1016/0010-0285\(90\)90003-M](https://doi.org/10.1016/0010-0285(90)90003-M)
- Schroder, H. S., Devendorf, A., & Zikmund-Fisher, B. J. (2023). Framing depression as a functional signal, not a disease: Rationale and initial randomized controlled trial. *Social Science & Medicine*, 328, Article 115995. <https://doi.org/10.1016/j.socscimed.2023.115995>
- Schuman, H., & Presser, S. (1996). *Questions and answers in attitude surveys: Experiments on question form, wording, and context*. Sage.
- Schwartzstein, J., & Sunderam, A. (2021). Using models to persuade. *American Economic Review*, 111(1), 276–323. <https://doi.org/10.1257/aer.20191074>
- Schwarz, N., Jalbert, M., Noah, T., & Zhang, L. (2021). Metacognitive experiences as information: Processing fluency in consumer judgment and decision making. *Consumer Psychology Review*, 4(1), 4–25. <https://doi.org/10.1002/arc.1067>
- Schwarz, N., & Oyserman, D. (2001). Asking questions about behavior: Cognition, communication, and questionnaire construction. *American Journal of Evaluation*, 22(2), 127–160. <https://doi.org/10.1177/10982140010220020>
- Semino, E. (2021). “Not soldiers but fire-fighters”—Metaphors and Covid-19. *Health Communication*, 36(1), 50–58. <https://doi.org/10.1080/10410236.2020.1844989>
- Semino, E., Demjén, Z., Demmen, J., Koller, V., Payne, S., Hardie, H., & Rayson, P. (2017). The online use of Violence and Journey metaphors by cancer patients, as compared with health professionals: A mixed methods study. *BMJ Supportive and Palliative Care*, 7(1), 60–66. <https://doi.org/10.1136/bmjspcare-2014-000785>
- Semino, E., Demjén, Z., Hardie, A., Payne, S., & Rayson, P. (2018). *Metaphor, cancer and the end of life: A corpus-based study*. Routledge.
- Shah, A. K., & Oppenheimer, D. M. (2007). Easy does it: The role of fluency in cue weighting. *Judgment and Decision Making*, 2(6), 371–379. <https://doi.org/10.1017/S1930297500000516>
- Shapiro, K. L., Caldwell, J., & Sorensen, R. E. (1997). Personal names and the attentional blink: A visual “cocktail party” effect. *Journal of Experimental Psychology: Human Perception and Performance*, 23(2), 504–514. <https://doi.org/10.1037/0096-1523.23.2.504>
- Sheeran, P., & Webb, T. L. (2016). The intention-behavior gap. *Social and Personality Psychology Compass*, 10(9), 503–518. <https://doi.org/10.1111/spc3.12265>
- Shen, F., Sheer, V. C., & Li, R. (2015). Impact of narratives on persuasion in health communication: A meta-analysis. *Journal of Advertising*, 44(2), 105–113. <https://doi.org/10.1080/00913367.2015.1018467>
- Sher, S., & McKenzie, C. (2006). Information leakage from logically equivalent frames. *Cognition*, 101(3), 467–494. <https://doi.org/10.1016/j.cognition.2005.11.001>
- Sher, S., McKenzie, C. R., Müller-Trede, J., & Leong, L. (2022). Rational choice in context. *Current Directions in Psychological Science*, 31(6), 518–525. <https://doi.org/10.1177/09637214221120387>
- Shrout, P. E., & Rodgers, J. L. (2018). Psychology, science, and knowledge construction: Broadening perspectives from the replication crisis. *Annual Review of Psychology*, 69, 487–510. <https://doi.org/10.1146/annurev-psych-122216-011845>
- Sieck, W., & Yates, J. F. (1997). Exposition effects on decision making: Choice and confidence in choice. *Organizational Behavior and Human Decision Processes*, 70(3), 207–219. <https://doi.org/10.1006/obhd.1997.2706>
- Sikveland, R. O., & Stokoe, E. (2020). Should police negotiators ask to “talk” or “speak” to persons in crisis? Word selection and overcoming resistance to dialogue proposals. *Research on Language and Social Interaction*, 53(3), 324–340. <https://doi.org/10.1080/08351813.2020.1785770>
- Silva, R. R., Chrobot, N., Newman, E., Schwarz, N., & Topolinski, S. (2017). Make it short and easy: Username complexity determines trustworthiness above and beyond objective reputation. *Frontiers in Psychology*, 8, Article 2200. <https://doi.org/10.3389/fpsyg.2017.02200>
- Simchon, A., Edwards, M., & Lewandowsky, S. (2024). The persuasive effects of political microtargeting in the age of generative artificial intelligence. *PNAS Nexus*, 3(2), Article pgae035. <https://doi.org/10.1093/pnasnexus/pgae035>
- Slobin, D. I. (1996). From “thought and language” to “thinking for speaking.” In J. J. Gumperz & S. C. Levinson (Eds.),

- Rethinking linguistic relativity: Studies in the social and cultural foundations of language* (pp. 70–96). Cambridge University Press.
- Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research*, 177(3), 1333–1352. <https://doi.org/10.1016/j.ejor.2005.04.006>
- Sopory, P., & Dillard, J. P. (2002). The persuasive effects of metaphor: A meta-analysis. *Human Communication Research*, 28(3), 382–419. <https://doi.org/10.1111/j.1468-2958.2002.tb00813.x>
- Sparkman, G., & Walton, G. M. (2017). Dynamic norms promote sustainable behavior, even if it is counternormative. *Psychological Science*, 28(11), 1663–1674. <https://doi.org/10.1177/0956797617719950>
- Sparkman, G., & Walton, G. M. (2019). Witnessing change: Dynamic norms help resolve diverse barriers to personal change. *Journal of Experimental Social Psychology*, 82, 238–252. <https://doi.org/10.1016/j.jesp.2019.01.007>
- Sperber, D., & Wilson, D. (1986). *Relevance: Communication and cognition*. Harvard University Press.
- Stark, E., Baldwin, A. S., Hertel, A. W., & Rothman, A. J. (2017a). The role of rational and experiential processing in influencing the framing effect. *The Journal of Social Psychology*, 157(3), 308–321. <https://doi.org/10.1080/00224545.2016.1198301>
- Stark, E., Baldwin, A. S., Hertel, A. W., & Rothman, A. J. (2017b). Understanding the framing effect: Do affective responses to decision options mediate the influence of frame on choice? *Journal of Risk Research*, 20(12), 1585–1597. <https://doi.org/10.1080/13669877.2016.1200654>
- Steiger, A., & Kühberger, A. (2018). A meta-analytic reappraisal of the framing effect. *Zeitschrift für Psychologie*, 226(1), 45–55. <https://doi.org/10.1027/2151-2604/a000321>
- Stephensen, M. B., Schulze, C., Landrø, M., Hendriks, J., & Hetland, A. (2021). Should I judge safety or danger? Perceived risk depends on the question frame. *Journal of Experimental Psychology: Applied*, 27(3), 485–502. <https://doi.org/10.1037/xap0000354>
- Strauss, C., & Quinn, N. (1997). *A cognitive theory of cultural meaning*. Cambridge University Press.
- Sullivan, J. (2019). The primacy effect in impression formation: Some replications and extensions. *Social Psychological and Personality Science*, 10, 432–439. <https://doi.org/10.1177/1948550618771003>
- Sullivan, K. (2023). Three levels of framing. *Wiley Interdisciplinary Reviews: Cognitive Science*, Article e1651. <https://doi.org/10.1002/wcs.1651>
- Swidler, A. (1986). Culture in action: Symbols and strategies. *American Sociological Review*, 51(2), 273–286. <https://doi.org/10.2307/2095521>
- Takemura, K. (1994). Influence of elaboration on the framing of decision. *The Journal of Psychology*, 128(1), 33–39. <https://doi.org/10.1080/00223980.1994.9712709>
- Tannen, D. (Ed.). (1993). What's in a frame? Surface evidence for underlying expectations. *Framing in discourse* (pp. 14–56). Oxford University Press.
- Tannenbaum, M. B., Hepler, J., Zimmerman, R. S., Saul, L., Jacobs, S., Wilson, K., & Albarracín, D. (2015). Appealing to fear: A meta-analysis of fear appeal effectiveness and theories. *Psychological Bulletin*, 141(6), 1178–1204. <https://doi.org/10.1037/a0039729>
- Tappin, B. M., Wittenberg, C., Hewitt, L. B., Berinsky, A. J., & Rand, D. G. (2023). Quantifying the potential persuasive returns to political microtargeting. *Proceedings of the National Academy of Sciences, USA*, 120(25), Article e2216261120. <https://doi.org/10.1073/pnas.2216261120>
- Teeny, J. D., Siev, J. J., Briñol, P., & Petty, R. E. (2021). A review and conceptual framework for understanding personalized matching effects in persuasion. *Journal of Consumer Psychology*, 31(2), 382–414. <https://doi.org/10.1002/jcpy.1198>
- Thibodeau, P. H. (2016). Extended metaphors are the home runs of persuasion: Don't fumble the phrase. *Metaphor and Symbol*, 31(2), 53–72. <https://doi.org/10.1080/10926488.2016.1150756>
- Thibodeau, P. H., & Boroditsky, L. (2011). Metaphors we think with: The role of metaphors in reasoning. *PLOS ONE*, 6(2), Article e16782. <https://doi.org/10.1371/journal.pone.0016782>
- Thibodeau, P. H., & Boroditsky, L. (2013). Natural language metaphors covertly influence reasoning. *PLOS ONE*, 8(1), Article e52961. <https://doi.org/10.1371/journal.pone.0052961>
- Thibodeau, P. H., Crow, L., & Flusberg, S. J. (2017). The metaphor police: A case study of the role of metaphor in explanation. *Psychonomic Bulletin & Review*, 24(5), 1375–1386. <https://doi.org/10.3758/s13423-016-1192-5>
- Thibodeau, P. H., & Flusberg, S. J. (2017). Metaphorical accounting: How framing the federal budget like a household's affects voting intentions. *Cognitive Science*, 41(S5), 1168–1182. <https://doi.org/10.1111/cogs.12475>
- Thibodeau, P. H., & Flusberg, S. J. (2022). Metaphor and elaboration in context. In H. L. Colston, T. Matlock, & G. J. Steen (Eds.), *Dynamism in metaphor and beyond* (pp. 223–240). John Benjamins. <https://doi.org/10.1075/milcc.9.12thi>
- Thibodeau, P. H., Frantz, C. M., & Berretta, M. (2017). The earth is our home: Systemic metaphors to redefine our relationship with nature. *Climatic Change*, 142(1), 287–300. <https://doi.org/10.1007/s10584-017-1926-z>
- Thibodeau, P. H., Hendricks, R. K., & Boroditsky, L. (2017). How linguistic metaphor scaffolds reasoning. *Trends in Cognitive Sciences*, 21(11), 852–863. <https://doi.org/10.1016/j.tics.2017.07.001>
- Thibodeau, P. H., Lee, D., & Flusberg, S. J. (2016). Context, but not proficiency, moderates the effects of metaphor framing: A case study in India. In A. Papafragou, D. J. Grodner, D. Mirman, & J. Trueswell (Eds.), *Proceedings of the 38th Annual Conference of the Cognitive Science Society* (pp. 1571–1576). Cognitive Science Society.
- Thibodeau, P. H., Matlock, T., & Flusberg, S. J. (2019). The role of metaphor in communication and thought. *Language & Linguistics Compass*, 13(5), Article e12327. <https://doi.org/10.1111/lnc3.12327>
- Thierry, G., Athanasopoulos, P., Wiggett, A., Dering, B., & Kuipers, J. R. (2009). Unconscious effects of language-specific terminology on preattentive color perception. *Proceedings*

- of the National Academy of Sciences, USA, 106(11), 4567–4570. <https://doi.org/10.1073/pnas.0811155106>
- Trope, Y., & Liberman, N. (2012). Construal level theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology: Vol. 1* (pp. 118–134). Sage.
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5(2), 207–232. [https://doi.org/10.1016/0010-0285\(73\)90033-9](https://doi.org/10.1016/0010-0285(73)90033-9)
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453–458. <https://doi.org/10.1126/science.7455683>
- Ünal, E., & Papafragou, A. (2016). Interactions between language and mental representations. *Language Learning*, 66(3), 554–580. <https://doi.org/10.1111/lang.12188>
- Urban, T. (2023). *What's our problem? A self-help book for societies*. Wait But Why.
- van der Linden, S. (2021). The Gateway Belief Model (GBM): A review and research agenda for communicating the scientific consensus on climate change. *Current Opinion in Psychology*, 42, 7–12. <https://doi.org/10.1016/j.copsyc.2021.01.005>
- van Dijk, T. A. (2023). Analyzing frame analysis: A critical review of framing studies in social movement research. *Discourse Studies*, 25(2), 153–178. <https://doi.org/10.1177/14614456231155080>
- Van Lange, P. A., & Huckelba, A. L. (2021). Psychological distance: How to make climate change less abstract and closer to the self. *Current Opinion in Psychology*, 42, 49–53. <https://doi.org/10.1016/j.copsyc.2021.03.011>
- Van Stee, S. K. (2018). Meta-analysis of the persuasive effects of metaphorical vs. literal messages. *Communication Studies*, 69(5), 545–566. <https://doi.org/10.1080/10510974.2018.1457553>
- Vasilyeva, N., & Lombrozo, T. (2020). Structural thinking about social categories: Evidence from formal explanations, generics, and generalization. *Cognition*, 204, Article 104383. <https://doi.org/10.1016/j.cognition.2020.104383>
- Vazire, S. (2018). Implications of the credibility revolution for productivity, creativity, and progress. *Perspectives on Psychological Science*, 13(4), 411–417. <https://doi.org/10.1177/1745691617751884>
- Vlasceanu, M., Doell, K. C., Bak-Coleman, J. B., Todorova, B., Berkebile-Weinberg, M. M., Grayson, S. J., Patel, Y., Goldwert, D., Pei, Y., Chakroff, A., Pronizius, E., van den Broek, K. L., Vlasceanu, D., Constantino, S., Morais, M. J., Schumann, P., Rathje, S., Fang, K., Aglioti, S. M., . . . Van Bavel, J. J. (2024). Addressing climate change with behavioral science: A global intervention tournament in 63 countries. *Science Advances*, 10(6), Article eadj5778. <https://doi.org/10.1126/sciadv.adj5778>
- Voelkel, J. G., & Feinberg, M. (2018). Morally reframed arguments can affect support for political candidates. *Social Psychological and Personality Science*, 9(8), 917–924. <https://doi.org/10.1177/1948550617729408>
- Voelkel, J. G., Malik, M., Redekopp, C., & Willer, R. (2022). Changing Americans' attitudes about immigration: Using moral framing to bolster factual arguments. *Annals of the American Academy of Political and Social Science*, 700(1), 73–85. <https://doi.org/10.1177/00027162221083877>
- Voelkel, J. G., Mernyk, J. S., & Willer, R. (2023). Moral reframing increases support for economically progressive candidates. *PNAS Nexus*, 2(6), Article pgad154. <https://doi.org/10.1093/pnasnexus/pgad154>
- von Frisch, K. (1967). *The dance language and orientation of bees*. Harvard University Press.
- Walsh, J., Vaida, N., Coman, A., & Fiske, S. T. (2022). Stories in action. *Psychological Science in the Public Interest*, 23(3), 99–141. <https://doi.org/10.1177/15291006231161337>
- Walter, N., Tukachinsky, R., Pelled, A., & Nabi, R. (2019). Meta-analysis of anger and persuasion: An empirical integration of four models. *Journal of Communication*, 69(1), 73–93. <https://doi.org/10.1093/joc/jqy054>
- Walton, G. M., & Banaji, M. R. (2004). Being what you say: The effect of essentialist linguistic labels on preferences. *Social Cognition*, 22(2), 193–213. <https://doi.org/10.1521/soco.22.2.193.35463>
- Wang, Y., & Gennari, S. P. (2019). How language and event recall can shape memory for time. *Cognitive Psychology*, 108, 1–21. <https://doi.org/10.1016/j.cogpsych.2018.10.003>
- Weaver, D., McCombs, M., & Shaw, D. L. (2004). Agenda-setting research: Issues, attributes, and influences. In L. L. Kaid (Ed.), *Handbook of political communication research* (pp. 257–280). Lawrence Erlbaum Associates.
- Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, 132(2), 249–268. <https://doi.org/10.1037/0033-2909.132.2.249>
- Werner, C. P., Birkhaeuer, J., Locher, C., Gerger, H., Heimgartner, N., Colagiuri, B., & Gaab, J. (2021). Price information influences the subjective experience of wine: A framed field experiment. *Food Quality and Preference*, 92, Article 104223. <https://doi.org/10.1016/j.foodqual.2021.104223>
- Whorf, B. L. (2012). *Language, thought, and reality: Selected writings of Benjamin Lee Whorf* (J. B. Carroll, S. C. Levinson, & P. Lee, Eds.). MIT Press. (Original work published 1940)
- Winawer, J., Witthoft, N., Frank, M. C., Wu, L., Wade, A. R., & Boroditsky, L. (2007). Russian blues reveal effects of language on color discrimination. *Proceedings of the National Academy of Sciences, USA*, 104(19), 7780–7785. <https://doi.org/10.1073/pnas.0701644104>
- Wodak, D., Leslie, S. J., & Rhodes, M. (2015). What a loaded generalization: Generics and social cognition. *Philosophy Compass*, 10(9), 625–635. <https://doi.org/10.1111/phc3.12250>
- Wolff, P., & Holmes, K. J. (2011). Linguistic relativity. *Wiley Interdisciplinary Reviews: Cognitive Science*, 2(3), 253–265. <https://doi.org/10.1002/wcs.104>
- Wolsko, C., Ariceaga, H., & Seiden, J. (2016). Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors. *Journal of Experimental Social Psychology*, 65, 7–19. <https://doi.org/10.1016/j.jesp.2016.02.005>
- Wood, N. L., & Cowan, N. (1995). The cocktail party phenomenon revisited: Attention and memory in the classic selective listening procedure of Cherry (1953). *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21(2), 123–135. <https://doi.org/10.1037/0278-7393.21.2.123>



- & Cognition, 21, 255–260. <https://doi.org/10.1037//0096-3445.124.3.243>
- Wu, S. H., Elpers, N., Doherty, E. M., Flusberg, S. J., & Holmes, K. J. (2021, July 26–29). *Pragmatic reasoning ability predicts syntactic framing effects on social judgments* [Paper presentation]. 43rd Annual Meeting of the Cognitive Science Society, Virtual.
- Xu, J. (2023). A meta-analysis comparing the effectiveness of narrative vs. statistical evidence: Health vs. non-health contexts. *Health Communication, 38*(14), 3113–3123. <https://doi.org/10.1080/10410236.2022.2137750>
- Yang, J. Z., & Chu, H. (2018). Who is afraid of the Ebola outbreak? The influence of discrete emotions on risk perception. *Journal of Risk Research, 21*(7), 834–853. <https://doi.org/10.1080/13669877.2016.1247378>
- Yang, J. Z., Rickard, L. N., Liu, Z., & Boze, T. (2021). Too close to care? A replication study to re-examine the effect of cued distance on climate change engagement. *Environmental Communication, 15*(1), 1–11. <https://doi.org/10.1080/17524032.2020.1777181>
- Ye, W., Li, Q., & Yu, S. (2021). Persuasive effects of message framing and narrative format on promoting COVID-19 vaccination: A study on Chinese college students. *International Journal of Environmental Research and Public Health, 18*(18), Article 9485. <https://doi.org/10.3390/ijerph18189485>
- Yeager, D. S., Hanselman, P., Walton, G. M., Murray, J. S., Crosnoe, R., Muller, C., Tipton, E., Schneider, B., Hulleman, C. S., Hinojosa, C. P., Paunesku, D., Romero, C., Flint, K., Roberts, A., Trott, J., Iachan, R., Buontempo, J., Yang, S. M., Carvalho, C. M., . . . Dweck, C. S. (2019). A national experiment reveals where a growth mindset improves achievement. *Nature, 573*(7774), 364–369. <https://doi.org/10.1038/s41586-019-1466-y>
- Young, N. A., Shuster, M. M., & Mikels, J. A. (2019). The sure thing: The role of integral affect in risky choice framing. *Emotion, 19*(6), 1035–1043. <https://doi.org/10.1037/emo0000505>
- Zebregs, S., van den Putte, B., Neijens, P., & de Graaf, A. (2015). The differential impact of statistical and narrative evidence on beliefs, attitude, and intention: A meta-analysis. *Health Communication, 30*(3), 282–289. <https://doi.org/10.1080/10410236.2013.842528>
- Zhuang, J., & Guidry, A. (2022). Does storytelling reduce stigma? A meta-analytic view of narrative persuasion on stigma reduction. *Basic and Applied Social Psychology, 44*(1), 25–37. <https://doi.org/10.1080/01973533.2022.2039657>
- Zwaan, R. A., & Radvansky, G. A. (1998). Situation models in language comprehension and memory. *Psychological Bulletin, 123*(2), 162–185. <https://doi.org/10.1037/0033-2909.123.2.162>