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Going beyond a positive–negative dichotomy in judgment and decision-making research: Insights for framing, counterfactual thinking, and ambivalence

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Abstract

Many areas of judgment and decision-making research have historically relied on a simple positive–negative dichotomy (e.g., positive vs. negative framing). Although this classic assumption about the conceptual space has contributed to some of the field's more impactful findings (e.g., framing effects), it may also have mistakenly led us to believe that these findings told a complete story about biases in processing positive and negative information. Building on a tradition of theoretical accounts outlining how positive and negative information is more complex, the first part of this paper considers how the following three elements jointly help to tell a more complete story about framing effects: (a) regulatory focus theory's concept of the domain (loss vs. gain) of an outcome, (b) the sequencing of positive and negative frames, and (c) the asymmetric influences of positive and negative evaluative processes. Next, the paper reviews research that has contributed to integrating these elements, highlighting opportunities for further integration to generate new insights for framing effects, risky decision-making, counterfactual thinking, and ambivalence. The reviewed studies suggest that a more sophisticated conceptualization of positive and negative information contributes to a deeper understanding of the basic processes that govern human judgment and decision-making.

1 | INTRODUCTION

"Good" and "bad" are two of the most fundamental human concepts. People can readily categorize nearly all experiences in terms of a simple positive–negative dichotomy. We can see the glass of water as half full (positive) or half empty (negative), we can think of how our day could have been better (positive) or could have been worse (negative), and we can describe how much we like (positive) or dislike (negative) heading out on a morning run. Yet increasing research suggests that this dichotomy may be oversimplified, constraining the questions researchers tend to ask about positive and negative information as well as the results they tend to find. This paper takes up the issue of how positive and negative information is conceptualized in judgment and decision-making research by considering how more nuanced formulations have deepened our understanding of some of the basic principles that describe how people think, feel, and make decisions.

2 | JUDGMENT AND DECISION-MAKING INSIGHTS FROM A POSITIVE–NEGATIVE DICHOTOMY

Positive–negative dichotomies are ubiquitous in classic judgment and decision-making research and have generated some of the field's more influential findings. One prominent example is research on framing effects, which has found that people respond differently to the same issue when it emphasizes positives versus emphasizes negatives. For instance, a jobs placement program is rated more highly when it is expressed in terms of its success rate (positive) versus its failure rate (negative; Davis & Bobko, 1986), and a risky (vs. riskless) program option to combat a disease outbreak is evaluated more favorably when it is described in terms of how many lives will be lost (negative) versus how many will be saved (positive; Tversky & Kahneman, 1981). Such framing effects have been found to have critical implications for financial and medical decision-making (see Kühberger, 1998; Levin, Schneider, & Gaeth, 1998 for reviews). But framing is just one of many literatures that has historically relied on a positive–negative dichotomy.

Counterfactual thinking is another topic area that has tended to focus on a positive–negative dichotomy by emphasizing how a past outcome could have been better (an upward counterfactual) versus could have been worse (a downward counterfactual). For example, tripping over a tree root on a running path may lead to thoughts of how things could have turned out better for your ankle (upward), whereas a quick step to the side to avoid a tree root may instead produce thoughts of how things could have turned out worse (downward). Research on counterfactual comparisons has found that emotional responses are more intense and longer lasting for upward versus downward counterfactuals (e.g., Allen, Greenlees, & Jones, 2014), and intentions to change future behavior are more likely to emerge from upward versus downward counterfactuals (e.g., Epstude & Roese, 2008).

Perhaps the most far-reaching instantiation of a positive–negative dichotomy is found in early work on negativity bias. Across many domains, research has documented a general and seemingly fundamental human tendency to weigh negative information more heavily than positive information (see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001 for reviews). For example, studies have found that people pay closer attention to negative than positive stimuli (Fiske, 1980) and have stronger reactions to negative than positive emotions (Clore, Schwarz, & Conway, 1994). Moreover, the greater power of negative outcomes over positive outcomes is at the heart of prospect theory's loss aversion principle (Kahneman & Tversky, 1979), which has been used to explain an impressive variety of psychological phenomena from the endowment effect to risk taking to avoid loss, with implications spanning the behavioral sciences.

As this section makes clear, a positive–negative dichotomy has been implicit in many classic findings in judgment and decision-making research. But, employing such a simplified assumption about the conceptual space necessarily involves trade-offs. One the one hand, a positive–negative dichotomy may often describe the way people communicate valenced information in everyday life, and a dichotomy may be easy to incorporate into psychological paradigms and theories. On the other hand, if such a dichotomy is an oversimplification of the underlying psychological

processes at play when evaluating something positively or negatively, it begs the question of whether these classic findings overlook some important aspects of positive and negative information processing.

3 | MORE COMPLEX CONCEPTUALIZATIONS OF POSITIVE AND NEGATIVE INFORMATION

Several different lines of thinking in social psychology have advocated for more complex conceptualizations of positive and negative information. Regulatory focus theory provided one prominent theoretical development with evidence that negative and positive outcomes are experienced differently in the domain of losses (when outcomes concern punishments or problems) compared to the domain of gains (when outcomes concern rewards or advancements[1]; Higgins, 1997; Higgins & Liberman, 2018; Idson, Liberman, & Higgins, 2000; Liberman, Idson, & Higgins, 2005; Scholer, Zou, Fujita, Stroessner, & Higgins, 2010). To illustrate, a person could have a goal of using cash instead of credit to make a purchase in order to avoid a penalty (in the domain of losses) or in order to receive a discount (in the domain of gains). However, Idson et al.'s (2000) studies found that it feels worse to pay a penalty (a negative in the loss domain) than it does to not receive a discount (a negative in the gain domain). And it feels better to receive a discount (a positive in the gain domain) than it does to avoid a penalty (a positive in the loss domain; see also Idson, Liberman, & Higgins, 2004; Liberman et al., 2005). Regulatory focus research has also suggested that the experience of being in the loss versus gain domain may result in different preferred means (vigilant vs. eager, respectively) for pursuing positive outcomes (Crowe & Higgins, 1997; Higgins, 1997; Molden, 2012). In sum, theorizing about regulatory focus suggests that a simple positive–negative dichotomy may miss important differences that emerge if research were to take into account the domain of an outcome (loss vs. gain) along with its valence (negative vs. positive).

Research on sequentially encountered frames has brought attention to another way in which a positive–negative dichotomy may be oversimplified. Positive and negative information is often encountered over time, in sequence (Ledgerwood & Boydstun, 2014). For instance, people rarely see an issue framed just once. Instead, they tend to see different, competing frames sometimes in quick succession. A person might hear one political candidate describe the success rate of a jobs program (positive) and then hear another candidate emphasize the failure rate of the same program (negative). This implies that, in everyday life, people may often need to switch from thinking about positive information to thinking about negative information or vice versa. Sequential framing research therefore points to the possibility that people's responses to positive and negative information may depend not only on the valence of the information right in front of them but also on their ability to switch away from the information that came before. Indeed, sequencing has been found to be crucial for understanding psychological processes in a number of topic areas (e.g., Asch, 1946; Gawronski, Rydell, Vervliet, & De Houwer, 2010). Put simply, the sequencing or order of positive and negative information may matter, and is a factor largely ignored in classic considerations of positive and negative information.

Attitude theorists have highlighted additional shortcomings of a positive–negative dichotomy. In particular, Cacioppo and colleagues' evaluative space model has emphasized that positive and negative evaluative processes do not always function as polar opposites, and in some cases, should be modeled separately to fully account for their asymmetric influences (Cacioppo & Berntson, 1994; Cacioppo, Gardner, & Berntson, 1997, 1999). Indeed, rather than a simple positive or negative attitude toward running, people can both like some aspects of running (the runner's high) and dislike others (the fatigue and muscle soreness). Something can affect how positive people feel about running without influencing how negative they feel about it and vice versa. Although positive and negative evaluations can sometimes be symmetric opposing forces, they need not always be. In fact, two key asymmetries have been shown to reliably influence people's evaluations: negativity bias (a stronger response to negative than positive events) and positivity offset (in an unfamiliar environment, a tendency to perceive events positively; e.g., Cacioppo et al., 1997). If a positive–negative dichotomy introduces an artificial bipolarity, it may constrain our understanding

of important asymmetries like negativity bias. It therefore seems critical for research to consider the fact that positive and negative evaluations can function simultaneously and asymmetrically.

Taken together, these different theoretical accounts suggest that although a dichotomy has been an important starting point for the conceptualization of positive and negative information, considerable theorizing emphasizes the need to move beyond it. Moreover, these accounts highlight the opportunity for future research to continue in this tradition. Building on this idea, the next section integrates the above theoretical accounts in the context of framing effects to contribute to a more comprehensive conceptual framework for studying positive and negative framing.

4 | TOWARD A FRAMEWORK FOR MOVING BEYOND A POSITIVE–NEGATIVE DICHOTOMY IN FRAMING

Joining a tradition of going beyond a positive–negative dichotomy (e.g., Cacioppo et al., 1997; Higgins, 1997), my colleagues and I have integrated the above theorizing to propose a new conceptual framework for understanding how people respond to positive and negative framing (Sparks & Ledgerwood, 2017). Classic framing paradigms are built around comparing a single positive frame (e.g., jobs saved) to a single negative frame (e.g., jobs lost) but applying (a) regulatory focus theory's concept of domain, (b) the sequencing of positive and negative frames, and (c) the asymmetric influences of positive and negative evaluations, suggest several changes to the way framing effects are typically studied and understood.

To illustrate how these theoretical accounts are integrated and applied, consider the classic framing scenario involving a jobs placement program (e.g., Davis & Bobko, 1986). First, regulatory focus theory's concept of domain (loss vs. gain; Higgins, 1997) implies that a jobs program could be thought of as preventing jobs from being lost, focusing on the possibility of a loss or punishment (i.e., the domain of losses). As in many classic framing paradigms, this prospective, loss-domain outcome could be framed either negatively (e.g., how many jobs will still be lost) or positively (e.g., how many jobs will be saved; Tversky & Kahneman, 1981). But importantly, a jobs program could also be thought of as creating new jobs, focusing instead on the possibility of a gain or reward (i.e., the domain of gains). This prospective, gain-domain outcome could also be framed either negatively (e.g., how many jobs will not materialize) or positively (e.g., how many new jobs will be created). As this example illustrates, there are two different types of negative frames (experiencing a loss *or* missing a gain) and two different types of positive frames (avoiding a loss *or* experiencing a gain), rather than only one of each (see Figure 1; see also Idson et al., 2000; Liberman et al., 2005). Whereas the positive–negative dichotomy used in the majority of framing research implies that only two frames matter, our perspective joins work on regulatory focus theory to emphasize that all four frames may be important for understanding framing effects (see also Lee & Aaker, 2004).

Second, research on sequentially encountered frames suggests that these distinct types of negative and positive frames (i.e., loss and non-loss vs. non-gain and gain) may often be encountered in sequence (Ledgerwood & Boydstun, 2014; Sparks & Ledgerwood, 2017). If this is the case, people will have to switch from thinking about an issue framed negatively to thinking about it framed positively (or move in the opposite direction, from positive to negative framing). Because research on regulatory focus has suggested that negative and positive outcomes are experienced differently in the loss and gain domains (Idson et al., 2000), we reasoned that the ability to switch between negative and positive frames may also differ in the loss and gain domains.

Finally, integrating regulatory focus theory with research on asymmetries in negative and positive evaluations allowed us to generate specific predictions. Drawing on the literature on negativity bias (Baumeister et al., 2001; Cacioppo et al., 1997; Rozin & Royzman, 2001), we reasoned that in the domain of losses (where negative and positive frames reflect the presence and absence of a punishment or problem), it may often be useful for negative frames to stick in the mind and resist reframing. A negativity bias in sequential framing (more difficultly in switching when an initial frame is negative vs. positive) may help people to maintain vigilance and attend to potential threats. In contrast, drawing on the literature on positivity offset (e.g., Cacioppo et al., 1997), we reasoned that in the domain of

		Domain	
		Loss	*Gain*
Valence	*Negative*	loss (e.g., jobs lost)	non-gain (e.g., jobs that did not materialize)
	Positive	non-loss (e.g., jobs saved)	gain (e.g., jobs created)

FIGURE 1 Past valence-framing research has mostly focused on the two shaded cells in the loss domain, but this omits the two cells in the gain domain (Sparks & Ledgerwood, 2017). For example, a jobs program could be designed to prevent jobs from being lost (a potential loss) or it could be designed to create new jobs (a potential gain). Either prospective outcome could be framed negatively (e.g., the number of jobs lost or the number of jobs that did not materialize) or positively (e.g., the number of jobs saved or the number of new jobs created)

gains (where positive and negative frames reflect the presence and absence of a reward or advancement), it may no longer be useful for negative frames to have strong sticking power. Instead, there may be contexts where a positivity bias in sequential framing (more difficulty in switching when an initial frame is positive vs. negative) would emerge, in order to help people maintain eagerness and attend to new potential opportunities. Our conceptual framework therefore predicts that the ability to switch between negative and positive frames will differ across domains. A negativity bias in sequential framing (more difficulty in switching when an initial frame is negative vs. positive) will emerge in the loss domain but will disappear or reverse into a positivity bias in sequential framing (more difficulty in switching when an initial frame is positive vs. negative) in the gain domain. That is, our framework implies that integrating the conceptual distinctions described above can help researchers to understand when to expect a negativity bias and when not to expect one.

In research designed to test the predictions from our conceptual framework, my colleagues and I adapted and expanded classic framing paradigms (e.g., Levin et al., 1998) to include (a) orthogonal manipulations of domain (loss vs. gain) and frame valence (positive vs. negative) and (b) sequentially encountered frames (Sparks & Ledgerwood, 2017). For example, we had participants read about a cognitive training regimen designed to either prevent memory loss (in the loss domain) or improve memory capacity (in the gain domain). Participants first saw the regimen framed in either positive terms (e.g., 60% success rate of regimen) or negative terms (e.g., 40% failure rate of the regimen) and then saw it reframed in the opposing way (i.e., positive-to-negative or negative-to-positive). Attitudes toward the regimen were recorded at two time points: once after the initial frame and again after the reframe. This design thereby allowed us to assess how much participants' attitudes changed in response to reframing (the sequential framing effect) in both the loss and gain domains.

Consistent with the idea that it is more difficult for people to switch when an initial frame is negative (vs. positive), participants in the loss domain changed their attitudes less when an initial frame was negative (vs. positive). Further mirroring predictions from our framework, the negativity bias in sequential framing found in the domain of losses, disappeared in the domain of gains. Additional studies demonstrated that patterns of even-handedness versus positivity bias in the gain domain are often more complex and sensitive to moderation (Sparks & Ledgerwood, 2017; Studies 3–5). Taken together, these findings imply that moving beyond a positive–negative dichotomy can help identify theoretically important bounds to what is often considered a general negativity bias (Sparks & Ledgerwood, 2017, 2019a).

The remainder of this paper reviews empirical research that has contributed to integrating domain, sequencing, and asymmetries in positive and negative evaluations, highlighting new evidence and opportunities for further integration in research on framing and risky decision-making, counterfactual thinking, and ambivalence.

5 | FRAMING AND RISKY DECISION-MAKING

The first valence-framing research to incorporate regulatory focus theory's concept of domain focused on testing whether domain matters for understanding the effect of one positive versus negative frame in isolation (e.g., Highhouse & Paese, 1996; Lee & Aaker, 2004). Taken together, this handful of studies produced conflicting results; whereas some studies suggested that domain may not moderate single-shot framing effects (Highhouse & Paese, 1996), others found evidence consistent with the idea that domain does play a moderating role (e.g., Lee & Aaker, 2004). By integrating the concept of domain with sequencing and asymmetries in positive and negative evaluations, new research has applied our conceptual framework (as described in the previous section) to provide a more cohesive account of framing across different contexts (Boydstun, Ledgerwood, & Sparks, 2019; Sparks, Frost, & Ledgerwood, 2019). For example, new studies have found that similar patterns of bias describe how people switch between positive to negative frames involving risky choices (e.g., Sparks et al., 2019). These findings imply that our conceptual framework may help unify the interdisciplinary literature on framing and inform adjacent topic areas like the literature on risky decision-making.

Recent regulatory focus research has also used the concept of domain to generate new insights for risky decision-making. In a series of studies using a stock-investment paradigm, Scholer et al. (2010) demonstrated that risky and conservative choices (e.g., stock options equivalent in expected value but with high and low variance, respectively) function as tactics that can be used to serve the same underlying motivational concern (e.g., in the domain of losses, to eliminate the possibility of loss and return to the status quo). That is, people may often be willing to take risks under conditions of loss because risky tactics tend to best serve their motivation to return to the status quo. If a conservative tactic were to maximize the chances of returning to the status quo, these same individuals would tend to make conservative choices instead. Other studies have found that risky and conservative tactics can also serve the motivation of moving beyond the status quo to attain rewards in the domain of gains and have identified specific conditions under which people will switch risk tactics in the gain domain (Zou, Scholer, & Higgins, 2014). Thus, research investigating the psychological experience of being in the domain of losses versus the domain of gains has expanded our understanding of when and why people are motivated to switch between more risky versus conservative tactics (see also Higgins & Cornwell, 2016), in addition to how positive versus negative framing may support or hinder such switches (Sparks et al., 2019). Future research might fruitfully expand on these findings by considering different operationalizations of risk and by taking into account how perceptions of risk are influenced by positive and negative affect (e.g., Finucane, Alhakami, Slovic, & Johnson, 2000). As this empirical evidence demonstrates, the core tenets of our conceptual framework for moving beyond a positive–negative dichotomy can deepen what we know about framing effects and risky decision-making.

6 | COUNTERFACTUAL THINKING

The majority of research on counterfactual thinking has been organized around understanding how a past outcome might have turned out better (upward counterfactual) versus might have turned out worse (downward counterfactual), but some studies have drawn on theorizing on regulatory focus to begin to move beyond a simple upward–downward dichotomy. For example, studies have suggested that domain (loss vs. gain) may moderate the tendency to generate subtractive upward counterfactuals (that undo past action; e.g., if only I had not stepped on that tree root, things would have turned out better for my ankle) versus additive upward counterfactuals (that undo past inaction; e.g., if only I had done those ankle strengthening exercises, things would have been better; Roese, Hur, & Pennington, 1999). Other research has found evidence consistent with the idea that when people are concerned with losses (vs. gains), generating certain types of downward (vs. upward) counterfactuals “feel right” and tend to increase persistence on tasks (Markman, McMullen, Elizaga, & Mizoguchi, 2006). Despite these advances beyond an

upward–downward dichotomy, the counterfactual thinking literature has not yet considered seriously how the sequencing of upward and downward counterfactuals matters.

New research on sequential counterfactuals proposes that just as certain frames can stick in people's minds and be more difficult to switch away from, so too might considering one direction of counterfactual make it more difficult to reconsider the opposing direction. Once a person considers a worse or better alternative to reality, that direction may stick and limit how much their feelings change in the opposing direction (Sparks & Ledgerwood, 2019b). In research designed to test this idea, my colleagues and I developed a paradigm that included (a) orthogonal manipulations of domain (loss vs. gain) and counterfactual direction (upward vs. downward) and (b) sequential counterfactuals. Participants completed a card-flipping task with the goal of losing as few points as possible (in the loss domain) or winning as many points as possible (in the gain domain). All participants chose a card to flip, and then half of the participants learned that they could have done better (upward counterfactual) and the other half learned that they could have done worse (downward counterfactual). After reporting their initial feelings about their choice, all participants saw the opposite counterfactual (i.e., upward-to-downward or downward-to-upward) and reported their feelings again. Conceptually similar to the sequential framing paradigm, our design allowed us to assess how much participants' feelings changed in response to the sequential counterfactual in both the loss and gain domains. Results suggested that the biases that characterize sequential framing may also characterize sequential counterfactual thinking: A negativity bias persisted in the loss domain (less affect change when an initial counterfactual was downward vs. upward) that did not appear in the gain domain. These empirical findings imply that our conceptual framework initially conceived to understand framing may also have implications for understanding counterfactual thinking. Thus, to fully understand the consequences of counterfactual simulation, it seems important to move beyond a simple upward–downward dichotomy to consider how counterfactuals resist reconsideration in the loss and gain domains. Current research out of our lab is zeroing in on the mechanisms underlying these effects and testing implications for mood repair interventions.

Recent research has also begun to integrate theorizing about the separate and asymmetric influences of positive and negative evaluations into the literature on counterfactual thinking. Drawing on the evaluative space model, Norris and Larsen (2019) investigated whether a combination of upward and downward counterfactuals could lead the status quo to feel mixed (both good and bad) rather than neutral (neither good nor bad). In a study designed to test this idea, participants played games with a 40% chance to win (upward counterfactual), a 40% chance to lose (downward counterfactual), and a 20% chance to get nothing (the status quo). Findings indicated that mixed feelings were higher for the status quo outcome compared to wins or losses. This result emphasizes that a complete understanding of how counterfactuals influence affective responses may require conceptualizing and modeling positives and negatives outcomes separately. Ongoing research investigating sequential counterfactuals and sequential frames is aimed at continuing to incorporate and test ideas about separability.

7 | AMBIVALENCE

The literature on ambivalence is another topic area concerned with positives and negatives that continues to draw new insights from moving beyond a positive–negative dichotomy (e.g., Cacioppo et al., 1997; Snyder & Tormala, 2017). Although the existing ambivalence literature highlights the importance of the separate and asymmetric influences of positive and negative evaluations, it has overlooked the potential importance of the sequencing of positive and negative information in the loss and gain domains.

New research from our lab has begun to investigate sequencing, or whether switching from positive to negative (vs. negative to positive) framing can lead to differences in the experience of ambivalence (Sparks & Schneider, 2019). Whereas a positive–negative dichotomy could predict that the impact of switching between positive and negative frames will be net neutral, a conceptualization of positive and negative evaluations as separable and asymmetric leaves room for the possibility of mixed feelings to emerge (e.g., Norris & Larsen, 2019) and play out differently in the loss and gain domains. Consistent with classic conceptualizations of ambivalence as an indicator of a weak

attitude that is susceptible to change (e.g., Thompson, Zanna, & Griffin, 1995), initial findings indicate that subjective ambivalence (i.e., feeling mixed, conflicted, and undecided) is higher in conditions where initial attitudes more flexibly shift in response to reframing (e.g., positive-to-negative framing in the loss domain) compared to conditions where initial attitudes have a stronger tendency to get stuck and limit responses to reframing (e.g., negative-to-positive framing in the loss domain; Sparks & Schneider, 2019). These results imply that sequencing and domain may play critical and underappreciated roles in understanding how ambivalent attitudes take shape.

Recent research inspired by the separate and asymmetric influences of positivity and negativity has challenged another classic assumption about subjective ambivalence—its tendency to increase with the number of mixed (positive *and* negative) reactions (Snyder & Tormala, 2017). Consistent with the stronger psychological power of negative over positive outcomes, Snyder and Tormala (2017) demonstrated that subjective ambivalence is maximized when positive reactions outnumber negative ones, rather than when positive and negative reactions are equally numerous. These studies highlight how the key tenets of our framework can be used to qualify and update some of the fundamental assumptions underlying ambivalence.

8 | SUMMARY AND CONCLUSION

Taken together, the research reviewed above suggests that domain, sequencing, and asymmetries in positive and negative evaluations play key roles in shaping responses to valenced information that are not fully captured by a simple positive–negative dichotomy. Negative and positive outcomes are experienced differently in the domain of losses and the domain of gains, and research that has used this key conceptual distinction from regulatory focus theory has clarified and extended findings about framing effects, risky decision-making, and counterfactual thinking. Investigating the sequencing of positive and negative frames has shed light on when to expect a negativity bias—and when not to expect one—and uncovered similar patterns of bias that play out when people consider different valenced mental processes (e.g., framing and counterfactual thinking) in sequence. Drawing on the separate and asymmetric influences of positive and negative evaluations has qualified classic assumptions about the experience of ambivalence. By considering how these different conceptual ideas work in concert to contribute to a more sophisticated conceptualization of positive and negative information, judgment and decision-making research can move toward a more complete understanding of how people think about good and bad.

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ENDNOTE

[1] In the regulatory focus language, a concern with the loss domain (i.e., losses and non-losses) is often referred to as a prevention focus, and a concern with the gain domain (i.e., gains and non-gains) is often referred to as a promotion focus (e.g., Idson et al., 2000).

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