Do Hedonic Motives Moderate Regulatory Focus Motives? Evidence From the Framing of Persuasive Messages

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Research on regulatory focus has established a *regulatory matching effect*: The persuasiveness of a message is enhanced when regulatory orientations of message and perceiver match (i.e., both are promotion or both are prevention). We report evidence that varying the hedonic outcome reverses this effect. We manipulated hedonic outcome by explicitly stating pleasurable versus painful outcomes as part of the message frame as well as by priming perceivers to focus on either pleasurable or painful outcomes. When both message and perceiver were focused on pleasurable outcomes, we replicated the regulatory matching effect. However, the matching effect reversed when the hedonic outcome of the message was opposed to that of the perceiver (i.e., one was pleasurable and the other painful). Under these conditions, messages that mismatched the perceivers' regulatory orientation were more persuasive (i.e., promotion message for a prevention oriented perceiver or vice versa). We also examined the persuasion effects when both message and perceiver were focused on painful outcomes and found that the regulatory matching effect re-emerged. The reversal of the regulatory matching effect by hedonic outcome strongly suggests that hedonic motives (approach of pleasure vs. avoidance of pain) and regulatory focus motives are distinct constructs. This is important because contrary to theoretical statements these constructs have often been confounded.

Keywords: gain, loss, attitudes, valence, motivation

Valence, that is, positivity and negativity (Lewin, 1926, 1935), is among the most important constructs in psychology. It plays a central role in domains such as motivation, emotions, decision making, learning, and persuasion. The valenced outcomes that an individual might face have been conceptualized in terms of four types, namely, gain, non-gain, loss, and non-loss (Gray, 1971; Higgins, 1997; Mowrer, 1960; Roseman, 1984). These outcomes arise from two distinct motivational mechanisms. One mechanism, hedonism, categorizes outcomes in terms of whether they feel pleasurable or painful (e.g., Corr, 2004; Feldman Barrett & Russell, 1998; Roseman, 1984; Tversky & Kahneman, 1981). Accordingly, gains and non-losses are pleasurable outcomes, whereas non-gains and losses are painful outcomes. The second mechanism, regulatory focus, categorizes outcomes based on whether they are gain-related or loss-related (Higgins, 1997, 1998), with gains and non-gains being gain-related, and losses and non-losses being loss-related (see also Roseman, 1984; Watson, Wiese, Vaidya, & Tellegen, 1999).

Specific theories typically focus on one motivational mechanism and consequently, reduce the four outcomes to two types (either pleasure vs. pain, or gain-related vs. loss-related). Although focusing on one mechanism allows for more parsimonious theorizing, such a simplification implicitly assumes that these mechanisms operate in an additive manner. If however, the mechanisms interact such that one moderates, and at the extreme, reverses the effect of the other, this conceptual simplification could overlook important theoretical insights. Indeed, we report such a reversal in the domain of persuasion, suggesting that the two underlying mechanisms do interact. Consequently, it may be theoretically expedient to consider the four outcomes rather than reduce them to any combination of two. Thus, the current research examines the relationship between hedonic motives and regulatory focus motives, with the objective of identifying how the interplay between them influences persuasion. In the General Discussion, we examine whether our findings in the domain of persuasion have implications for the domains of emotions, individual differences in motivation, and decision making.

Persuasion and Four Types of Outcome-Based Frames

In the domain of persuasion, the four types of outcomes have been operationalized in terms of four message frames, namely, gain, non-gain, loss, and non-loss (see Cesario, Corker, & Jelinek, 2013; see Table 1). However, here as well, specific theories typically focus on one mechanism and contrast only two types of frames. Consider regulatory focus theory (Higgins, 1997, 1998, 2012), which has been highly influential in understanding the effects of framing on persuasion (e.g., Aaker & Lee, 2001; Cesario, Grant, & Higgins, 2004; Evans & Petty, 2003; Lee & Aaker,

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Table 1
Types of Mindsets and Message Frames: Gain, Non-Loss, Non-Gain, and Loss

	Hedonic outcome	
Regulatory orientation	Pleasure	Pain
Promotion	Gain	Non-gain
Prevention	Non-loss	Loss

2004; Malaviya & Sternthal, 2009). According to this theory, people adopt one of two regulatory orientations. In a *promotion orientation*, our ideals are accessible and we are motivated to approach these ideal end states by adopting eager means. In a *prevention orientation*, our duties and obligations are accessible and we are motivated to approach these ought end states by being vigilant and engaging in safe and secure actions to successfully prevent anything that might get in the way of fulfilling our obligations. Further, promotion orientation sensitizes us to gain-related outcomes, both gains and non-gains, because these are motivationally relevant, while prevention orientation sensitizes us to loss-related outcomes, both non-losses and losses, because these are motivationally relevant.

This difference in sensitivity to different outcomes has been utilized for framing persuasive messages. In some instances, the message is explicitly worded in terms of gain-related outcomes, such as wins, or loss-related outcomes, such as non-losses (Cesario et al., 2004; Higgins, 1997, 2002; Higgins, Idson, Freitas, Spiegel, & Molden, 2003; Labroo & Lee, 2006; Lee & Aaker, 2004; Shah, Higgins, & Friedman, 1998). In other instances, instead of making the gain or loss relatedness semantically explicit, the message describes outcomes that are either promotion-relevant or prevention-relevant (Aaker & Lee, 2001; Evans & Petty, 2003; Lee & Aaker, 2004; Safer, 1998, as cited in Higgins, 2002; Wang & Lee, 2006). The theory assumes that promotion outcomes are mentally represented as gain-related, while prevention outcomes are mentally represented as loss-related (Higgins, 1997). For example, a message could be phrased such that engaging in a particular behavior (e.g., drinking a juice) may result either in a promotion related outcome (e.g., provides energy) or in a prevention-related outcome (e.g., prevents clogged arteries). The message promising to promote greater energy would be mentally represented in terms of a gain, even if the message does not explicitly spell out the word "gain," and the message promising to prevent clogged arteries would be mentally represented in terms of a non-loss, even if the message does not spell out the word "non-loss" (see Cesario et al., 2013, for more details on these types of messages). Thus, we assume that messages that invoke mental representations of gain, non-gain, loss and non-loss will be psychologically equivalent to those framed as gain, non-gain, loss, and non-loss, respectively.

Whether messages are framed as gain-/loss-related or phrased as promotion/prevention-relevant, the general finding is that when the mental representation of the message frame matches the regulatory orientation of the individual, message persuasiveness increases. Individuals with a promotion orientation are more persuaded by a message that is mentally represented as gain-related, whereas those with a prevention orientation are more persuaded by a message that is mentally represented as loss-related. We label this increased persuasiveness the *regulatory matching* effect.

Persuasion via regulatory matching has been explained in terms of processing fluency. Specifically, priming a regulatory orientation influences the fluency with which a perceiver processes a particular message frame (Lee & Aaker, 2004). If the primed regulatory orientation and message frame match, fluency is high and, in turn, this greater fluency leads to more favorable evaluations (Lee & Aaker, 2004). Beyond this core assumption, regulatory focus theory assumes that matching of frames to regulatory orientation occurs as a result of perceived relevance of the message, and it is this greater relevance that increases evaluations (Molden, Lee, & Higgins, 2008).

Whereas regulatory framing invokes regulatory focus motives as the mechanism for conceptualizing outcomes, one could also invoke the hedonic motives of approach and avoidance for conceptualizing outcomes. Message frames would then describe pleasurable versus painful outcomes, which we refer to as *hedonic framing*. The distinction between hedonic frames and regulatory frames is that whereas hedonic frames highlight pleasurable outcomes (gains or non-losses) or painful outcomes (non-gains or losses), regulatory frames highlight promotion-related outcomes (i.e., gain-related, either gains or non-gains) or prevention-related outcomes (i.e., loss-related, either non-losses or losses) (see Brendl, Higgins & Lemm, 1995; Higgins, 1997, 2012; Idson, Liberman, & Higgins, 2000, 2004; Lee & Aaker, 2004; Molden et al., 2008).

Persuasion and Four Types of Outcome-Based Mindsets

In addition to being relevant for framing, hedonic motives and regulatory focus motives also shape the mindsets people have. If these motives were to operate simultaneously, four types of mindsets could arise, focused on either a gain, a non-loss, a non-gain, or a loss (see Table 1). Note that whereas regulatory focus theory would assume that people are either promotion oriented or prevention oriented and is silent on whether there are distinct hedonic mindsets within each regulatory orientation, we assume that hedonic motives shape the type of mindset in addition to the influence of regulatory motives. Specifically, two promotion-oriented individuals would have distinct mindsets if one is more focused on pleasurable promotion-oriented outcomes (i.e., gain mindset) and the other is more focused on painful promotion-oriented outcomes (i.e., non-gain mindset). Similarly, two prevention-oriented individuals would have distinct mindsets if one is focused on pleasurable prevention-oriented outcomes (i.e., non-loss mindset) and the other is focused on painful prevention-oriented outcomes (i.e., loss mindset) (see also Crowe & Higgins, 1997; Idson et al., 2000). Thus, we assume that in addition to a regulatory focus, people also have a "hedonic focus."

Interestingly, a similar conceptualization of mindsets is found in self-discrepancy theory (Higgins, 1987), the predecessor of regulatory focus theory. Specifically, self-discrepancy theory distinguishes two pain-focused mindsets. Those who chronically fail to meet their ideals, hopes, and aspirations are prone to have a pain mindset because they mentally represent their ideal self-discrepancies as non-gains. Similarly, those who chronically fail to meet their oughts, duties, and obligations are also prone to have a pain mindset because they mentally represent their ought self-discrepancies as losses. Although self-discrepancy theory has pri-

marily focused on discrepancies, that is, on the two pain mindsets, researchers have used this theory to examine pleasure mindsets as well. Those individuals who chronically meet their ideals, hopes, and aspirations have a pleasure mindset because they mentally represent their ideal consonances as gains, and those who chronically meet their oughts, duties, and obligations also have a pleasure mindset because they mentally represent their ought consonances as non-losses (Brendl et al., 1995; Brockner, Paruchuri, Idson, & Higgins, 2002; Evans & Petty, 2003; Pham & Avnet, 2004).

In the current research, our objective is to examine the interplay between the hedonism mechanism and the regulatory focus mechanism in the context of persuasion. Specifically, we examine how the persuasiveness of the four message frames is influenced by the four mindsets. Current theory predicts that gain and non-gain frames should be more persuasive for promotion-oriented mindsets compared to loss and non-loss frames, irrespective of whether mindsets are focused on gains or non-gains. Further, non-loss and loss frames should be more persuasive for prevention-oriented mindsets compared to gain and non-gain frames, irrespective of whether they are focused on non-losses or losses. In this article, we develop alternative predictions for how regulatory focus motives and hedonic motives interact to influence persuasion. Specifically, we predict that the persuasiveness of a message depends both on *regulatory matching*, that is, matching regulatory focus framed messages to regulatory focus mindsets, as well as *hedonic matching*, that is, matching hedonically framed messages to hedonically focused mindsets. Further, we predict that these two types of matching would interact. These issues have not been systematically investigated in prior research.

Four Scenarios Based on Combining Pleasure and Pain Outcomes

As a starting point, we review the relevant data from the literature on how regulatory focus influences persuasion. In order to systematically examine the role of hedonic motives, we organize our review in terms of four hedonically-based scenarios, which represent all combinations of pleasure or pain focus of mindsets and frames. Specifically, the four *hedonic scenarios* we examine are: (1) Pleasure Mindset–Pleasure Frame ($Ms^{+}Fr^{+}$), where mindsets and frames are both focused on pleasurable outcomes; (2) Pain Mindset–Pleasure Frame ($Ms^{-}Fr^{+}$), where mindsets are focused on painful outcomes but the message frames are focused on pleasurable outcomes; (3) Pleasure Mindset–Pain Frame ($Ms^{+}Fr^{-}$), where mindsets are focused on pleasurable outcomes but the message frames are focused on painful outcomes; and (4) Pain Mindset–Pain Frame ($Ms^{-}Fr^{-}$), where mindsets and frames are both focused on painful outcomes. The four gray quadrants in Figure 1 represent these hedonically-based scenarios, with the outermost band of text labeling the hedonic combinations. Within each of these scenarios, we examine the effect of matching versus mismatching the regulatory orientation of message frames to mindsets (*m*s vs. *mm*s in Figure 1). In Figure 1, Quadrants 1 and 4 represent hedonic matching of frames to mindsets, whereas Quadrants 2 and 3 represent hedonic mismatching.

In our review, we included only those studies where we could clearly identify that frames as well as mindsets had been varied within the same study. If studies varied only frames but not

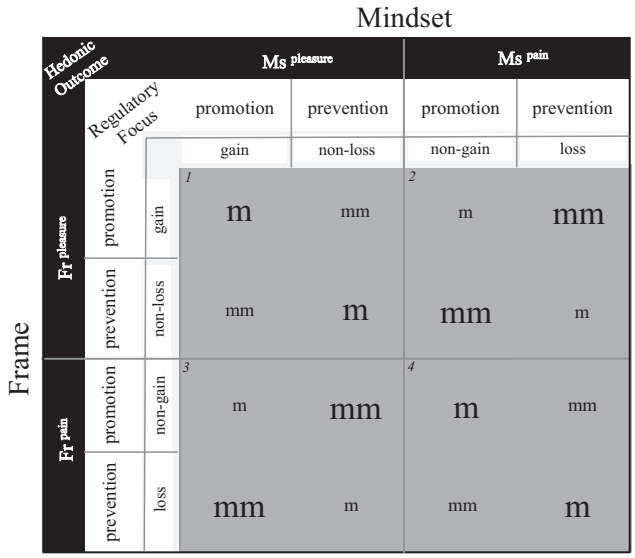

Figure 1. Predictions for the moderating effect of hedonic outcome on the regulatory matching effect as a function of four mindsets (promotion-pleasure, promotion-pain, prevention-pleasure, and prevention-pain) and four message frames (gain, non-gain, loss, and non-loss). Cells labeled *m* represent frames that are matched to mindsets in terms of regulatory orientation, whereas *mm* cells represent a mismatch. Thus, diagonals within each quadrant are matched, whereas off-diagonals are mismatched. In cells with large font size compared to small font size, messages are predicted to be more persuasive. Top left, Quadrant 1: pleasure mindsets (promotion-pleasure vs. prevention-pleasure) by pleasure frames (gain vs. non-loss). Top right, Quadrant 2: pain mindsets (promotion-pain vs. prevention-pain) by pleasure frames (gain vs. non-loss). Bottom left, Quadrant 3: pleasure mindsets (promotion-pleasure vs. prevention-pleasure) by pain frames (non-gain vs. loss). Bottom right, Quadrant 4: pain mindsets (promotion-pain vs. prevention-pain) by pain frames (non-gain vs. loss). Ms = mindset; Fr = frame.

mindsets, even if the frames included all four outcomes (e.g., Idson et al., 2004), or if studies varied mindsets alone and not frames, even if the mindsets included all four outcomes (e.g., Crowe & Higgins, 1997), we did not include them in our review. Further, if we were unable to identify the hedonic focus of the mindset or the frame (e.g., Higgins et al., 2003), or if we were unable to identify the regulatory focus of the mindset or the frame (e.g., Idson et al., 2004, Experiment 3), we did not include the study in our review.

Our literature review suggests that the regulatory matching effect has been reliably obtained in the Pleasure Mindset–Pleasure Frame ($Ms^{+}Fr^{+}$) scenario. That is, in Quadrant 1 of Figure 1, matching along regulatory orientation (*m*-cells) has been more persuasive than mismatching (*mm*-cells), represented by larger letters for *m*s than *mm*s. We examine whether this regulatory matching effect is also obtained in the other three scenarios, where either the mindset or the message frame or both are focused on painful outcomes. Three types of data patterns are possible. First, the regulatory matching effect may hold in all scenarios, indicating the absence of a moderating effect of hedonic motives. Only regulatory matching would influence persuasion, and hedonic matching would be irrelevant. Second, hedonic matching could influence persuasion in addition to and independent of regulatory

matching. Such a pattern would suggest an additive effect of hedonic motives and regulatory focus motives. Third, hedonic motives might moderate the effect of regulatory focus motives by reversing the regulatory matching effect on persuasion. Based on our review of the literature, we predict such a reversal effect.

Pleasure Mindsets, Pleasure Frames ($Ms^{+}Fr^{+}$)

In this scenario, mindsets and frames either are gains or non-losses (see Quadrant 1 in Figure 1), resulting in two regulatory matches (see Figure 1 *m*s) and two regulatory mismatches (see Figure 1 *mm*s). The majority of the extant research falls in this $Ms^{+}Fr^{+}$ scenario. In a typical study, regulatory orientation was operationalized using one of several procedures: listing ideal versus ought goals (e.g., Freitas & Higgins, 2002), listing promotion versus prevention goals (e.g., Cesario et al., 2004; Lee, Aaker, & Gardner, 2000), trying to obtain a reward by earning versus not losing points (e.g., Cesario et al., 2013, Study 4), measuring individual differences in independent versus interdependent selves (e.g., Aaker & Lee, 2001), measuring individual differences in self-consonances (e.g., Evans & Petty, 2003; Pham & Avnet, 2004), completing word fragments pertaining to promotion versus prevention orientation (e.g., Malaviya & Sternthal, 2009), or manipulating distinct promotion versus prevention-related mood states (Bosmans & Baumgartner, 2005).

We assume that mindsets in these studies were focused on pleasurable outcomes because the manipulations used to prime regulatory focus mindsets have generally included specific instructions or tasks that focus on pleasurable outcomes (e.g., Cesario et al., 2013, instructed participants to think about the reward to be gained from completing an anagram task; Malaviya & Sternthal, 2009, included only positive words in priming regulatory focus). Consequently, promotion-oriented participants would have had a gain mindset, and prevention-oriented participants would have had a non-loss mindset.[1] Further, the messages in these studies compared gain frames to non-loss frames. Thus, both mindsets and frames were focused on pleasurable outcomes. The findings reported in these studies support the regulatory matching effect: Persuasiveness was greater when the mindset matched the frame in terms of regulatory orientation than when it mismatched. We replicate this $Ms^{+}Fr^{+}$ scenario in our experiments as the baseline for the other scenarios that involve painful outcomes.

Pain Mindsets, Pleasure Frames ($Ms^{-}Fr^{+}$)

This scenario introduces painful outcomes through mindsets that are focused on either non-gain outcomes or loss outcomes. Message frames communicate pleasure and represent either gains or non-losses (see Quadrant 2 in Figure 1). In most studies belonging to this $Ms^{-}Fr^{+}$ scenario, regulatory focus was operationalized by measuring self-discrepancies that represent pain mindsets because they entail personal shortcomings. When respondents with these pain mindsets read pleasure-framed gain or non-loss messages, the regulatory matching effect seemed to reverse, such that mismatching along regulatory focus was more persuasive than matching. For example, Tykocinski, Higgins, and Chaiken (1994) reported that individuals with ideal discrepancies, that is, with a non-gain (promotion-pain) mindset, were more persuaded by a message with a mismatched non-loss frame than a matched gain-frame. Further, respondents with ought discrepancies, that is, a loss (prevention-pain) mindset, were more persuaded by a message with a mismatched gain-frame than a matched non-loss frame. Brendl et al. (1995) reported a similar reversal, although with experienced utility of money rather than persuasion. Figure 1 depicts this reversal effect by means of the larger *mm*s in Quadrant 2 versus the larger *m*s in Quadrant 1.

Additional evidence suggestive of the reversal of the regulatory matching effect comes from unpublished analyses of two other persuasion studies (Evans & Petty, 2003; Pham & Avnet, 2004, Study 4). These published studies report a self-consonance analysis, but the raw data also allowed analysis of self-discrepancies. This analysis showed that for respondents with high ideal discrepancies, that is, with a non-gain mindset, a non-loss message frame was most persuasive, whereas for those with high ought discrepancies, that is, a loss mindset, a gain message frame was most persuasive. These results, however, did not reach statistical significance (for Evans & Petty, non-significant—Petty, personal communication, March 18, 2003; for Pham & Avnet, significant for ideal discrepancies [$ps < .05$] but not for ought discrepancies [$p = .107$, $p = .170$]—Pham, personal communication, March 18, 2003).

Taken together, the existing data suggest that the regulatory matching effect might reverse when mindsets are focused on painful outcomes. However, these findings have failed to spark a serious discussion in the literature, we suspect for two reasons. First, as our review reveals, the reversal effect has not been reliably documented. Second, conceptual doubts have been raised about the relevance of this reversal effect for regulatory focus theory because the effect has been interpreted strictly as a defense mechanism that is unique to chronic self-discrepancies. The argument is that these individuals avoid processing matched messages because the messages activate painful self-discrepancies (Tykocinski et al., 1994), and therefore, these individuals are more persuaded by mismatched messages. Such defensive processing is not considered relevant to regulatory focus (or regulatory fit) theory, hence, the reversal is thought to have no implication for the regulatory matching effect.

Nevertheless, because such a reversal would be inconsistent with extant theorizing, in our view it is critical to examine whether the reversal extends to conventional manipulations of regulatory focus as well. Consequently, one of our main objectives is to provide evidence for the reversal of the regulatory matching effect under conditions that would not be considered unique to chronic self-discrepancies. We aim to achieve this by abstracting from chronic self-discrepancies to the construct of hedonically painful outcomes, both for mindsets and for message frames. In a subsequent section, we present a framework that accounts for the regulatory matching effect and its reversal. In addition, our hope is

[1] Not all manipulations of regulatory focus priming include instructions that focus on pleasurable outcomes, such as in the ideal/ought listing task. Nevertheless, we assume that when people are simply asked to list goals, it is more likely that they focus on goals that achieve pleasurable outcomes rather than ones that avoid painful ones. Some regulatory focus manipulations, such as the self-guide strength task (e.g., Higgins et al., 2003), are designed to capture both pleasure and pain mindsets. Consequently, for such manipulations, we cannot ascertain the hedonic focus and cannot classify these studies into Figure 1. These studies are not included in our review (e.g., Cesario et al., 2013, Study 3; Higgins et al., 2003).

that empirically documenting the reversal would stimulate research that carefully isolates the underlying mechanisms for it. To facilitate such research, we shall critically examine our preferred explanation and pit it against some plausible alternate mechanisms. We postpone this discussion until the General Discussion to assess each explanation against the constraints imposed by our data.

Pleasure Mindsets, Pain Frames ($Ms^{+}Fr^{-}$)

Like the previous scenario, the $Ms^{+}Fr^{-}$ scenario also incorporates pleasurable and painful outcomes. Here, the mindsets are focused on pleasure and they represent either gains or non-losses, and the message frames are focused on pain and they represent either non-gains or losses (see Quadrant 3 in Figure 1). We were unable to find any persuasion study that fits this scenario. Nevertheless, the $Ms^{+}Fr^{-}$ scenario is conceptually similar to the previous $Ms^{-}Fr^{+}$ scenario in that both involve one source of pleasure and one source of pain. Thus, if the relevant construct for the reversal is the presence of hedonically painful outcomes, conveyed here via the message, rather than self-defensiveness triggered by chronic self-discrepancies, the regulatory matching effect should again reverse, as symbolized by large *mm*s and small *m*s in Figure 1, Quadrant 3. Participants with a gain mindset (promotion-pleasure focus) should be more persuaded by a loss framed message, whereas participants with a non-loss mindset (prevention-pleasure focus) should be more persuaded by a non-gain framed message. In other words, in this scenario as in the previous one, regulatory matching should lead to reduced persuasion, but regulatory mismatching should lead to enhanced persuasion.

Pain Mindsets, Pain Frames ($Ms^{-}Fr^{-}$)

This final scenario involves only painful outcomes, with mindsets as well as message frames representing non-gains or losses (see Quadrant 4 in Figure 1). Studies reported in Brendl et al. (1995), while not in a persuasion context fit this scenario. These authors found that ideal discrepancies (i.e., non-gains) correlated with greater sensitivity to monetary non-gains, a regulatory matching effect (large *m* in Figure 1), whereas ought discrepancies (i.e., losses) correlated with increased sensitivity to monetary losses, also a regulatory matching effect (large *m* in Figure 1). Moreover, both self-discrepancies correlated with decreased sensitivity to mismatched frames. However, note that pain mindsets were measured in terms of self-discrepancies and were not manipulated. In addition, although the overall pattern of effects was significant, the simple effects were not. Similar regulatory matching effects were reported by Cesario et al. (2013, Study 1), who asked participants to judge the extent to which experiencing a painful health outcome would interfere with their goals, using procedures that suggest that the primed mindsets as well as message frames were focused on painful outcomes. In both Brendl et al. and Cesario et al., the results are consistent with a regulatory matching effect, despite painful outcomes being involved. In our studies, we seek to replicate this effect.

Hypotheses

Organizing the published data as in Figure 1 reveals a reversal of the regulatory matching effect. This suggests the hypothesis that hedonic motives moderate the influence of regulatory motives on message persuasiveness. When the outcomes involved in mindset and message are both pleasurable or both painful, the regulatory matching effect would hold—persuasion would be enhanced when the regulatory orientation of the mindset and of the message match (see large *m*s in Quadrants 1 and 4 of Figure 1). When mindset and message highlight opposite hedonic outcomes, the regulatory matching effect would reverse—persuasion would be enhanced when the regulatory orientation of the mindset mismatches that of the message (see large *mm*s in Quadrants 2 and 3 of Figure 1). In addition to suggesting a moderating effect of hedonic motives on the regulatory matching effect, these predictions imply an interesting corollary: Persuasion would be enhanced when mindsets and messages are matched in terms of their regulatory focus and hedonic focus, or if they mismatch on both these dimensions; persuasion would decrease if mindsets and messages match on one dimension, but mismatch on the other. Stated another way, regulatory matching would be effective only under conditions of hedonic matching, whereas under hedonic mismatching, regulatory mismatching would be more effective.

So far we have motivated these predictions empirically. Next, we present a theoretical account for them. However, because some important tenets of our theorizing are yet to be tested we are open to the possibility that other hypotheses could potentially explain the predicted reversal effect, as we explore in the General Discussion.

The Inhibition–Disinhibition Model

We present an *inhibition–disinhibition model* (IDM; Brendl et al., 1995) as a framework that could account for the interaction between hedonic motives and regulatory focus motives in influencing persuasion. At its core, the IDM predicts persuasion effects based on the principle of fluency: (1) The more fluently a message is processed, the more persuasive it should be; (2) a message is more fluently processed if it maps onto a highly accessible mental representation; and (3) accessibility of a mental representation can be increased by means of priming it. In our particular context, the four outcomes of psychological gains, non-gains, losses, and non-losses are assumed to be distinct mental representations, and each of these mental representations can be uniquely primed. A message framed in terms of gains, non-gains, losses, and non-losses would be mapped onto its corresponding mental representation. The more accessible that mental representation is as a result of priming, the more fluently that message would be processed, and the more persuasive it would be.

Thus, the IDM makes predictions about message persuasiveness based on changes in the accessibility of mental representations. Specifically, the IDM posits three effects on the accessibility of mental representations and their impact on persuasiveness. First, the IDM posits an *activation effect* where priming a particular mindset (say, gain) would enhance persuasiveness of a message that matches the mindset in terms of both hedonic outcome and regulatory focus (e.g., gain framed), that is, if there is both a hedonic match and a regulatory match.

In addition, when the primed mindset does not match the message on at least one dimension (hedonic mismatch and/or regulatory mismatch), the IDM predicts two other effects of priming a mindset, namely, inhibition and dis-inhibition. The *inhibition ef-*

fect derives from research on inhibitory associations, particularly lateral inhibition (O'Reilly & Munakata, 2000; Spratling & Johnson, 2002; Usher & McClelland, 2001). The IDM hypothesizes that a primed mindset inhibits mental representations that are related to it, but are not identical, in that they share either the hedonic outcome or regulatory orientation, but not both dimensions. Consequently, if a message matches the primed mindset on one dimension (hedonic or regulatory), but not the other, the mental representation of this message would be inhibited, resulting in reduced processing fluency and lower persuasion. Imagine priming an individual's gain mindset. For this mindset, a non-gain message would have a regulatory match but a hedonic mismatch, whereas a non-loss message would have a hedonic match, but a regulatory mismatch. Thus according to the IDM, priming a gain mindset should decrease persuasiveness of non-gain and non-loss messages; or more generally, of messages matched on one dimension and mismatched on the other dimension. The IDM predicts similar inhibitory effects for the following combination of mindsets and message frames: non-gain mindset with gain frame and loss frame; non-loss mindset with gain frame and loss frame; and loss mindset with non-loss frame and non-gain frame (see Brendl et al., 1995).

The third effect posited by the IDM is *dis-inhibition*, which is a byproduct of the inhibitory effects between mental representations. Dis-inhibition is predicted when message and mindset have neither a regulatory match nor a hedonic match. Consider once again priming a person's gain mindset. For this person, the mental representation of a loss is unrelated to the mental representation of a gain because losses differ from gains in their regulatory focus as well as in terms of the hedonic focus. In this situation, the gain mindset would not inhibit the mental representation of losses and could even boost its activation because these mental representations are connected by two sequential inhibitory links, thus resulting in dis-inhibition (Brendl et al., 1995). A similar case exists for a non-gain mindset, which has neither regulatory orientation nor hedonic outcome in common with non-losses and should dis-inhibit that mental representation. Further, a loss mindset should dis-inhibit a gain mental representation, and a non-loss mindset should dis-inhibit a non-gain mental representation. A dis-inhibited mental representation, because of its increased accessibility, would result in more fluent processing of the corresponding message frame and consequently increase its persuasiveness.

These three effects—activation, inhibition, and dis-inhibition—together predict a complete cross-over interaction between primed mindsets and message frames on persuasion. Consider the two promotion-oriented mindsets, gain and non-gain. Priming a gain mindset should increase persuasiveness of gain frames (activation), decrease persuasiveness of non-gain and non-loss frames (inhibition), and increase persuasiveness of loss frames (dis-inhibition). This pattern should reverse for priming a non-gain mindset, which should increase persuasiveness of non-gain frames, decrease persuasiveness of gain and loss frames, and increase persuasiveness of non-loss frames. Moreover, for the prevention-oriented mindsets, non-loss and loss, the IDM predicts a mirror image of this entire pattern. These predictions for message persuasiveness, which correspond to the large and small *m*s and *mm*s in Figure 1, shall be tested in the subsequent experiments.

Experiments 1a–1d

We conducted Experiments 1a–1d as a single study with random assignment of participants to conditions. To facilitate comprehension, we report the experiment as four sub-studies corresponding to our four hedonic scenarios. We manipulated the mindset of the participant and the framing of the message in terms of regulatory focus (promotion vs. prevention) and hedonic outcome (pleasurable vs. painful), resulting in four mindsets and four message frames. The four mindsets are gain (promotion-pleasure focus), non-loss (prevention-pleasure focus), non-gain (promotion-pain focus), and loss (prevention-pain focus). Similarly, the four message frames are gain (promotion-pleasure), non-loss (prevention-pleasure), non-gain (promotion-pain), and loss (prevention-pain). We crossed the four mindsets and the four frames orthogonally, resulting in 16 conditions. The four sub-studies consist of one combination of hedonic focus of mindset and hedonic outcome of frame: In Experiment 1a, mindsets and frames are both focused on pleasure; in Experiment 1b, mindsets are focused on pain and frames on pleasure; in Experiment 1c, mindsets are focused on pleasure and frames on pain; and in Experiment 1d, mindsets and frames are both focused on pain. Thus, these sub-studies correspond to the four hedonic scenarios we described earlier and to Quadrants 1–4 in Figure 1. Within each sub-study, we vary the regulatory focus of mindsets and frames. Next, we describe the procedure used in the full study (i.e., all 16 conditions).

Method

Participants and design. Respondents ($N = 326$; 204 women; average age = 23 years, $SD = 7$ years) were students and staff at a large U.S. university recruited for "several psychology and advertising studies." They were randomly assigned to a $2 \times 2 \times 2 \times 2$ factorial design of Hedonic Focus of Mindset (pleasure vs. pain) $\times$ Hedonic Outcome of Frame (pleasure vs. pain) $\times$ Regulatory Orientation of Mindset (promotion vs. prevention) $\times$ Regulatory Orientation of Frame (promotion vs. prevention). The first two factors combine to constitute our four hedonic scenarios, one for each sub-study, and the last two factors combine to constitute the regulatory focus conditions within each hedonic scenario. The number of participants assigned to Experiments 1a–1d, respectively, were $N = 83$, $N = 83$, $N = 80$, and $N = 80$.

Materials and procedure. The first two tasks respondents encountered were designed to prime their mindsets in terms of regulatory focus and hedonic focus. In the first task, participants were asked to list either their aspirations or duties following a procedure that has been extensively used in prior research (e.g., Freitas & Higgins, 2002; Higgins, Roney, Crowe, & Hymes, 1994; Idson et al., 2004; Liberman, Molden, Idson, & Higgins, 2001). Those to be promotion primed were asked to "think about a hope or an aspiration you currently have in your life" and "describe it in 2–3 sentences." Next, the instructions varied the hedonic outcome. Gain (promotion-pleasure) mindset participants were asked to "vividly imagine that you are able to achieve this hope or aspiration" and to write how this would make them feel. Non-gain (promotion-pain) mindset participants were asked to "vividly imagine that you are *unable* [emphasis added] to achieve this hope or aspiration" and to write how this would make them feel. The instructions for those to be prevention primed (non-loss or loss

mindset) were identical, except they were asked to think about a duty or an obligation, instead of a hope or aspiration.

Participants next completed a second priming task that involved completing word fragments, such as "H_ppy" (Malaviya & Sternthal, 2009). This was intended to strengthen the previous mindset manipulation. Those assigned to the gain mindset condition completed fragments of the following words: happy, pleasure, joyous, and elated. Participants in the other priming conditions completed fragments of other words: Safety, Secure, Calm, and Relief in the non-loss mindset condition; Unhappy, Gloomy, Dejected, and Sorrow in the non-gain mindset condition; and Frustrated, Worried, Upset, and Anxious in the loss mindset condition (for choice of these words, see Brendl et al., 1995; Higgins, 1987; Higgins, Shah, & Friedman, 1997; Roseman, 1984, 2008).

After priming the mindset, message framing was operationalized by presenting each participant with one of four print ads for a fictitious brand of juice, called "Poonga juice" (see Appendix A). The content of the ads varied the regulatory orientation and the hedonic outcome of the message. Using a procedure similar to that described in Aaker and Lee (2001), we varied regulatory orientation by highlighting the benefits of the juice as being related to "promoting energy" (promotion) versus "preventing heart disease" (prevention). To vary hedonic outcome, we framed the ad such that either consuming the juice would result in a pleasurable outcome or not consuming it would result in a painful outcome (Rothman & Salovey, 1997). In addition, we varied the name of the juice so that it would capture the essence of each frame. In the gain frame, the ad claimed that including the "EnergyBoost" juice in your diet would make you feel full of energy. In the non-gain frame, the ad claimed that excluding the "ReEnergy" juice from your diet could make you feel drained of energy. In the non-loss frame, the ad claimed that including the "HeartSafe" juice in your diet would improve the heart's immunity by keeping you safe from cholesterol build-up. Finally, in the loss frame, the ad claimed that excluding the "LoCholes" juice from your diet could weaken the heart by increasing the risk of cholesterol build-up.

After reading the persuasive message, respondents evaluated the Poonga juice on four 7-point scale items ranging from "−3" to "+3" and anchored by *bad/good*, *negative/positive*, *dislike/like*, and *unfavorable/favorable*. We averaged these items ($\alpha = .95$) into a single evaluation score. Analyses are reported for this evaluation score. Results of a 2 (Hedonic Focus of Mindset) × 2 (Hedonic Outcome of Frame) × 2 (Regulatory Orientation of Mindset) × 2 (Regulatory Orientation of Frame) analysis of variance (ANOVA) revealed only one significant effect, the four-way interaction, $F(1, 310) = 48.25$, $p < .0001$, $\eta^2 = .13$; all other effects, $p > .26$.

Experiment 1a: Pleasure Mindsets, Pleasure Frames

The primary objective of Experiment 1a was to replicate the regulatory matching effect. Specifically, we expected that regulatory matching (vs. mismatching) of message frame to primed mindset would increase evaluations.

Method. The design was a 2 × 2 factorial of Regulatory Orientation of Pleasure Mindsets (gain [promotion-pleasure] vs. non-loss [prevention-pleasure]) by Regulatory Orientation of Pleasure Message Frames (gain [promotion-pleasure] vs. non-loss [prevention-pleasure]).

Results. We subjected the Poonga juice evaluation score to a 2 × 2 ANOVA, with mindset (gain vs. non-loss) and message frame (gain vs. non-loss) as the independent variables (see Figure 2, Quadrant 1, for descriptive statistics). The only significant effect was the two-way interaction, $F(1, 79) = 17.01$, $p < .0001$, $\eta^2 = .18$; both main effects, $F < 1$. Individuals primed with a gain mindset evaluated the Poonga juice more favorably when the message highlighted greater energy (gain) ($M = 1.90$) rather than heart safety (non-loss) ($M = 0.79$), $F(1, 79) = 9.67$, $p < .003$, $\eta^2 = .10$. In contrast, those primed with a non-loss mindset evaluated the Poonga juice more favorably when the message highlighted greater heart safety (non-loss) ($M = 1.76$) rather than greater energy (gain) ($M = 0.80$), $F(1, 79) = 7.41$, $p < .01$, $\eta^2 = .08$.

Discussion. These findings replicate the regulatory matching effect. Persuasion was greater when the frame matched the mindset of the message recipient in terms of regulatory focus. However, recall that both mindsets and frames were focused on pleasure. The mindset primes asked participants to imagine successfully accomplishing their goals (aspirations or obligations), and the messages described pleasurable outcomes (greater energy or heart safety). Because hedonic outcomes were held constant across mindsets and frames, these findings do not clarify the influence of hedonic motives on the regulatory matching effect. The next three substudies address this issue: Will the regulatory matching effect replicate if either the mindset or the message is focused on painful outcomes?

Mindset

Frame: Hedonic Outcome	Regulatory Focus		Ms pleasure: promotion	Ms pleasure: prevention	Ms pain: promotion	Ms pain: prevention
			gain	non-loss	non-gain	loss
Fr pleasure	promotion	gain	1.90 (0.96)	0.80 (1.12)	0.78 (1.28)	1.70 (1.23)
Fr pleasure	prevention	non-loss	0.79 (1.29)	1.76 (1.21)	1.86 (1.07)	0.68 (1.12)
Fr pain	promotion	non-gain	0.85 (1.17)	1.59 (1.12)	1.55 (1.11)	0.66 (1.26)
Fr pain	prevention	loss	1.44 (1.20)	0.68 (1.41)	0.82 (1.01)	1.51 (1.25)

Figure 2. Evaluations of the Poonga juice in Experiments 1a–1d as a function of four mindsets (promotion-pleasure, promotion-pain, prevention-pleasure, and prevention-pain) and four message frames (gain, non-gain, loss, and non-loss). Numbers are means, and in parentheses are standard deviations. Promotion versus prevention orientation of the respondents' mindsets was manipulated by means of priming. Top left, Quadrant 1, Experiment 1a: pleasure mindsets (promotion-pleasure vs. prevention-pleasure) by pleasure frames (gain vs. non-loss). Top right, Quadrant 2, Experiment 1b: pain mindsets (promotion-pain vs. prevention-pain) by pleasure frames (gain vs. non-loss). Bottom left, Quadrant 3, Experiment 1c: pleasure mindsets (promotion-pleasure vs. prevention-pleasure) by pain frames (non-gain vs. loss). Bottom right, Quadrant 4, Experiment 1d: pain mindsets (promotion-pain vs. prevention-pain) by pain frames (non-gain vs. loss). Ms = mindset; Fr = frame.

Experiment 1b: Pain Mindsets, Pleasure Frames

In Experiment 1b, we primed pain mindsets of promotion or prevention orientation, but kept the pleasure frames from Experiment 1a. We expected that the pain mindset would reverse the regulatory matching effect, such that under a non-gain mindset (promotion-pain) the non-loss frame would be more persuasive, and under a loss mindset (prevention-pain) the gain frame would be more persuasive. Importantly, this prediction also addresses concerns that have been raised about past reversals of the regulatory matching effect. If we do observe the predicted reversal, it would provide evidence that this effect generalizes beyond chronic self-discrepancies to the more general construct of mindsets focused on painful outcomes.

Method. The design was a 2 × 2 factorial of Regulatory Orientation of Pain Mindsets (non-gain [promotion-pain] vs. loss [prevention-pain]) by Regulatory Orientation of Pleasure Message Frame (gain [promotion-pleasure] vs. non-loss [prevention-pleasure]).

Results. The 2 × 2 ANOVA of the evaluation of the Poonga juice revealed a significant two-way interaction, $F(1, 79) = 16.55$, $p < .0001$, $\eta^2 = .17$; both main effects, $F < 1$. Indeed, the regulatory matching effect was reversed (see Figure 2, Quadrant 2, for descriptive statistics). Specifically, individuals primed with a non-gain (promotion-pain) mindset evaluated the Poonga juice more favorably when the message highlighted greater heart safety (non-loss) ($M = 1.86$) rather than greater energy (gain) ($M = 0.78$), $F(1, 79) = 8.69$, $p < .004$, $\eta^2 = .09$. In contrast, those primed with a loss (prevention-pain) mindset evaluated the Poonga juice more favorably when the message highlighted greater energy (gain) ($M = 1.70$) rather than greater heart safety (non-loss) ($M = 0.68$), $F(1, 79) = 7.87$, $p < .01$, $\eta^2 = .08$.

Discussion. Compared to Experiment 1a, the only change in Experiment 1b was that the primed mindsets were focused on pain instead of pleasure. As a result the regulatory matching effect reversed: Persuasion was greater when the regulatory orientation of the mindset and that inherent in the frame *did not* match. For a promotion mindset, a prevention frame was most persuasive, and for a prevention mindset, a promotion frame was most persuasive. Recall that such reversals have previously been reported when chronic self-discrepancies were involved. This experiment is the first to show a reversal of the regulatory matching effect outside the domain of self-discrepancies. What makes this finding relevant for regulatory focus theory is that a person's focus on pleasure versus pain could reverse the influence of this person's regulatory focus. This possibility has not been considered in prior theorizing.

The IDM explains this reversal in terms of inhibition and dis-inhibition effects. Priming a pain mindset (e.g., non-gain) should inhibit mental representations that differ from this mindset hedonically (e.g., gain) but should dis-inhibit mental representations that differ in terms of both hedonic focus and regulatory focus (e.g., non-loss). Thus, when mindset and frame are matched in terms of regulatory focus, mismatching them hedonically invokes inhibition, and consequently diminishes persuasion. According to the IDM, this difference in hedonic outcomes between pain mindsets and pleasure frames is the crucial explanatory construct responsible for the reversal of the regulatory matching effect.

Experiment 1c: Pleasure Mindsets, Pain Frames

The difference in hedonic outcomes between mindsets and frames could also be operationalized with mindsets focused on pleasurable outcomes and frames focused on painful outcomes. This is the scenario implemented in Experiment 1c. The IDM predicts the same reversal of the regulatory matching effect. This experiment is important because it allows us to abstract from pain mindsets and pleasure frames (Experiment 1b alone) to the difference in hedonic outcome between mindsets and frames as the explanatory construct (Experiments 1b and 1c together).

Method. The design was a 2 × 2 factorial of Regulatory Orientation of Pleasure Mindsets (gain [promotion-pleasure] vs. non-loss [prevention-pleasure]) by Regulatory Orientation of Pain Message Frames (non-gain [promotion-pain] vs. loss [prevention-pain]).

Results. The 2 × 2 ANOVA of the evaluation of the Poonga juice revealed a significant two-way interaction, $F(1, 76) = 7.43$, $p < .01$, $\eta^2 = .09$; both main effects, $F < 1$. As expected, the regulatory matching effect was reversed (see Figure 2 for descriptive statistics). Specifically, individuals primed with a gain (promotion-pleasure) mindset evaluated the Poonga juice more favorably when the message highlighted a risk to the heart (loss frame) ($M = 1.44$) rather than the risk of drained energy (non-gain frame) ($M = 0.85$), although this difference did not reach statistical significance, $F(1, 76) = 2.28$, $p > .13$, $\eta^2 = .03$. In contrast, those primed with a non-loss (prevention-pleasure) mindset evaluated the Poonga juice more favorably when the message highlighted the risk of drained energy (non-gain frame) ($M = 1.59$) rather than a risk to the heart (loss frame) ($M = 0.68$), $F(1, 76) = 5.50$, $p < .02$, $\eta^2 = .07$. Further, the non-gain frame was more persuasive for individuals with a non-loss mindset rather than a gain mindset, $F(1, 76) = 3.59$, $p = .06$, $\eta^2 = .04$, whereas the loss frame was more persuasive for individuals with a gain mindset rather than a non-loss mindset, $F(1, 76) = 3.84$, $p < .05$, $\eta^2 = .05$.

Discussion. The findings of this study, though less reliable than the previous two studies, are consistent with our expectation that when the hedonic focus of mindsets and message frames differ, a mismatch between the regulatory focus of mindset and frame increases persuasion, whereas a match decreases persuasion, reversing the regulatory matching effect. Taken together, the findings of Experiments 1b and 1c support the premise that hedonic outcome reverses the regulatory matching effect, and that this reversal is not limited to the special case of chronic self-discrepancies. Because one simple effect in the $Ms^{+}Fr^{-}$ scenario of Experiment 1c did not reach statistical significance, Experiments 2 and 3 provide conceptual replication of this particular scenario.

Experiment 1d: Pain Mindsets, Pain Frames

Our data so far reveal that a reversal of the regulatory matching effect occurs when frames and mindsets are focused on opposite hedonic outcomes (Experiments 1b and 1c), thus implicating this difference in hedonic outcome as the cause of the reversal. However, these data are also consistent with another explanation. The construct responsible for the reversal could simply be the presence of a painful outcome in either frame or mindset. Thus, a focus on painful outcomes rather than the difference between hedonic outcomes may be the causal factor. Experiment 1d offers a test of this

competing explanation by including pain mindsets and pain frames. If the cause of the reversal is simply hedonic pain, the regulatory matching effect should again reverse because frames and mindsets would both involve pain. If, however, as predicted by the IDM, the cause is the difference in hedonic outcomes that mindset and frame focus on, the regulatory matching effect should re-emerge, because mindsets and frames would match in terms of hedonic outcome (both involving pain). Note that the frames in this experiment were identical to Experiment 1c; only the mindsets were changed to focus on pain.

Method. The design was a 2 × 2 factorial of Regulatory Orientation of Pain Mindset (non-gain [promotion-pain] vs. loss [prevention-pain]) by Regulatory Orientation of Pain Message Frame (non-gain [promotion-pain] vs. loss [prevention-pain]).

Results. The 2 × 2 ANOVA of the evaluation of the Poonga juice resulted in a significant two-way interaction, $F(1, 76) = 9.24$, $p < .003$, $\eta^2 = .11$; both main effects, $F < 1$. The interaction shows that the regulatory matching effect re-emerged (see Figure 2 for descriptive statistics). Specifically, individuals primed with a non-gain (promotion-pain) mindset evaluated the Poonga juice more favorably when the message highlighted the risk of drained energy (non-gain frame) ($M = 1.55$) rather than a risk to the heart (loss frame) ($M = 0.82$), $F(1, 76) = 3.94$, $p < .05$, $\eta^2 = .05$. In contrast, those primed with a loss (prevention-pain) mindset evaluated the juice more favorably when the message highlighted a risk to the heart (loss frame) ($M = 1.51$) rather than the risk of drained energy (non-gain frame) ($M = 0.66$), $F(1, 76) = 5.36$, $p < .02$, $\eta^2 = .06$.

Discussion. In Experiment 1d, the regulatory matching effect re-emerged: Persuasion was greater when the regulatory orientation of the mindset matched rather than mismatched that inherent in the message frame. However, in contrast to previous studies, both mindsets and frames involved hedonic pain. This result therefore rules out the explanation that the reversal of the regulatory matching effect obtained in Experiments 1b and 1c resulted from a focus on hedonic pain per se. Instead, the result supports the view that the regulatory matching effect reversed in Experiments 1b and 1c because the hedonic outcomes involved in mindsets and frames were mismatched.

Discussion of Experiments 1a–1d

Taken together the results across Experiments 1a–1d support the IDM hypothesis that hedonic outcome moderates the regulatory matching effect, and can even reverse it. When mindsets and message frames were both focused on pleasurable outcomes, or on painful outcomes, the regulatory matching effect emerged, that is, matching regulatory orientation of frame and mindset enhanced persuasion. In contrast, when mindsets and frames were focused on opposite hedonic outcomes, the regulatory matching effect reversed, that is, mismatching regulatory orientation of frame and mindset enhanced persuasion.

Experiment 2

Experiment 2 served several objectives. First, we sought to conceptually replicate Experiment 1 using a different stimulus to rule out the possibility of a stimulus artifact. Second, in Experiment 1 our message frames were manipulated by varying the content of the persuasive message itself (i.e., energy vs. health) and not by simply changing a reference frame. Although varying message content has been one approach to manipulating regulatory orientation of messages (e.g., Aaker & Lee, 2001; Lee & Aaker, 2004), it manipulates more than just a reference frame. In order to generalize to gain, non-gain, non-loss, and loss outcomes it would be better if we could manipulate just reference frames while holding message content constant. For these reasons, we adapted the stimulus used in Aaker and Lee (2001), by framing an advertisement for a tennis racquet in terms of winning, not winning, losing, or not losing a tennis match. Finally, we sought replication of the statistically weak results of Study 1c. With these considerations in mind, in Experiment 2 we primed only the two pleasure mindsets, but we included all four message frames, thus replicating Experiments 1a (Ms^+Fr^+) and 1c (Ms^+Fr^-). Considering that mindsets were focused on pleasure, we expected that the regulatory matching effect would replicate when frames are also focused on pleasure (Ms^+Fr^+), but would reverse when frames are focused on pain (Ms^+Fr^-).

Method

Participants and experimental design. We recruited native French-speaking Paris pedestrians ($N = 250$; 131 women; average age = 22 years, $SD = 4.6$ years). The design was a 2 × 2 × 2 between-subjects of Regulatory Orientation of Pleasure Mindsets (gain [promotion-pleasure] vs. non-loss [prevention-pleasure]) × Regulatory Orientation of Frame (two promotion frames [win and not win the match] vs. two prevention frames [lose and not lose the match]) × Hedonic Outcome of Frame (two pleasure frames [win and not lose] vs. two pain frames [lose and not win]).

Procedure. Participants were informed that they would be completing "several unrelated studies." The first two "studies" primed promotion versus prevention orientation as in Experiment 1. "Study 1" used the procedure where participants reflected on hopes/aspirations versus duties/obligations. However, unlike Experiment 1, respondents were not instructed to reflect on the success or failure of their goals. "Study 2" was the word completion task but with French words, whose English translation was as follows: in the gain (promotion-pleasure) mindset condition—pleasure, desire, active, and growth/fulfillment; in the non-loss (prevention-pleasure) mindset condition—relief, peaceful, reassured, and calm (for the choice of words, see Brendl et al., 1995; Higgins, 1987; Higgins et al., 1997). Note that all priming words reflected pleasurable outcomes.

During "Study 3," each participant was randomly assigned to one of four advertising messages adapted from Aaker and Lee (2001). The messages advertised a tennis racquet by describing a tennis match in progress from the perspective of one of the players. The four messages differed in terms of their regulatory orientation (two promotion frames: win or not win; two prevention frames: lose or not lose) as well as hedonic outcome (two pleasurable outcomes: win or not lose; two painful outcomes: not win or lose) (see Appendix B, self-version). These outcomes were described in terms of the thoughts going through the player's mind: "You are playing in a tennis tournament and have made it to the finals. You are thinking: By winning (not losing/not winning/losing) this last match, I will win (not lose/not win/lose) the championship title as well as the trophy." After a description of the tennis racquet, the

final paragraph of the ad repeated this statement: "By winning (not losing/not winning/losing) this last match, you will win (not lose/not win/lose) the championship title as well as the trophy." Thus, after reading the ad, respondents would have read about the tennis match in terms of one of four possible outcomes—win, not lose, not win, or lose. Following message exposure, participants evaluated the tennis racquet on the same attitude items as in Experiment 1, averaged into one evaluation score ($\alpha = .80$).

Results

We subjected the evaluation of the tennis racquet to a 2 × 2 × 2 ANOVA of Regulatory Orientation of Pleasure Mindsets (gain vs. non-loss) × Regulatory Orientation of Frame (promotion [win and not win] vs. prevention [lose and not lose]) × Hedonic Outcome of Frame (pleasure [win and not lose] vs. pain [lose and not win]). The only significant effect was the expected three-way interaction (see Figure 3), $F(1, 242) = 23.91$, $p < .0001$, $\eta^2 = .09$; all other Fs < 1. Separate analyses for the two scenarios follow.

***Ms*$^+$*Fr*$^+$ scenario.** We observed the expected regulatory matching effect. Respondents with a gain (promotion-pleasure) mindset evaluated the tennis racquet more favorably under the "win" frame ($M = 1.55$) than under the "not lose" frame ($M = 1.01$), $F(1, 242) = 3.78$, $p < .05$, $\eta^2 = .01$. In contrast, respondents with a non-loss (prevention-pleasure) mindset evaluated the racquet more favorably under the "not lose" frame ($M = 1.57$) than under the "win" frame ($M = 0.74$), $F(1, 242) = 8.56$, $p < .004$, $\eta^2 = .03$.

***Ms*$^+$*Fr*$^-$ scenario.** As expected, in this scenario the regulatory matching effect reversed. Respondents with a gain (promotion-pleasure) mindset evaluated the tennis racquet more favorably under the "lose" frame ($M = 1.76$) than under the "not win" frame ($M = 0.95$), $F(1, 242) = 8.41$, $p < .004$, $\eta^2 = .03$. In contrast, respondents with a non-loss (prevention-pleasure) mindset evaluated the racquet more favorably under the "not win" frame ($M = 1.45$) than under the "lose" frame ($M = 0.88$), $F(1, 242) = 4.04$, $p < .05$, $\eta^2 = .02$. As in Experiment 1c, persuasion was greater when the regulatory orientation of mindset and frame mismatched rather than matched.

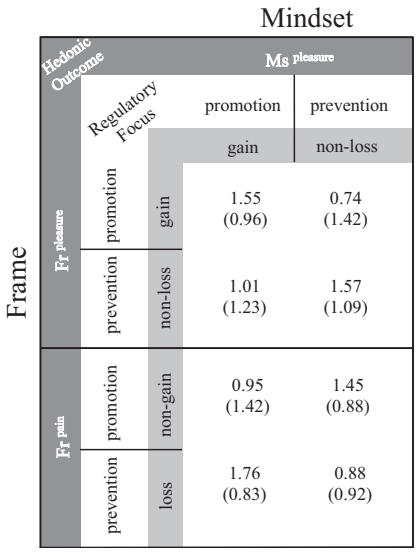

Figure 3. Evaluations of the tennis racquet in Experiment 2 as a function of four message frames (gain, non-gain, loss, and non-loss) by mindset (promotion-pleasure vs. prevention-pleasure). Numbers are means, and in parentheses are standard deviations. Promotion versus prevention orientation of the respondents was manipulated by means of priming. Top quadrant: Pleasurable outcome message frames (gain vs. non-loss). Bottom quadrant: Painful outcome message frames (non-gain vs. loss). Ms = mindset; Fr = frame.

Discussion

Replicating the results of Experiment 1a, we observed the regulatory matching effect when the primed mindsets were focused on pleasure and the message frames also involved pleasurable outcomes (the *Ms*$^+$*Fr*$^+$ scenario). Further, replicating Experiment 1c, when message frames were focused on painful outcomes (the *Ms*$^+$*Fr*$^-$ scenario), the regulatory matching effect reversed. In Experiment 2, using another content domain and holding the content of the messages constant across frames, we conceptually replicated the findings from Experiment 1. However, because in Experiment 2 we used the same mindset manipulations as Experiment 1, it would be worthwhile to show that the reversal of the regulatory matching effect does not depend on this particular manipulation. Experiment 3 addresses this issue.

Experiment 3

The objective of Experiment 3 was to enhance the construct validity of our mindset manipulation. Toward this end, we adopted a procedure of activating mindsets that presumably has only regulatory focus in common with our earlier mindset primes. Specifically, we activated interdependent versus independent self-views, which previous studies have shown is a causal antecedent of regulatory focus (Aaker & Lee, 2001; Lee et al., 2000). If activating these self-views leads to the same findings as using our earlier mindset primes, it would support the conclusion that our data pattern resulted from activating the regulatory focus construct and not from some other idiosyncratic aspect of the priming procedure.

About half of our participants read the tennis racquet message from Experiment 2. Because this message describes the tennis match as if respondents were playing it for themselves, it activates an independent self-view. The other participants read a modified message that described the match as if they were playing for a team. This activates an interdependent self-view. We expected both self-views to result in mindsets focused on pleasure. In an independent self-view, a person has the goal of "distinguishing oneself from others in a positive manner" (Lee et al., 2000, p. 1123). That is, an independent self-view should activate a gain mindset. In contrast, in an interdependent self-view, the dominant goal is "to maintain harmony with others in the social setting" (Lee et al., 2000, p. 1123; see also Markus & Kitayama, 1991; Triandis, 1989), which requires that people ensure nothing untoward occurs to disrupt the social harmony. Such an orientation induces a concern for the absence of pain; that is, a non-loss mindset. Otherwise, the design and materials of Experiment 3 were identical to Experiment 2, and thus the predictions were identical.

Method

Participants and design. French speaking Paris pedestrians (N = 192; 133 women; mean age = 21 years, SD = 2.2 years) were assigned to the same 2 × 2 × 2 design as in Experiment 2.

Procedure. The advertising message was written either as if the tennis player was playing for her/himself or for a team (see Appendix B). In the "self" condition, the message read as follows: "*You* [emphasis added] are playing in a tennis tournament and have made it to the finals. You are thinking: By winning (not losing/not winning/losing) this last match, *I* [emphasis added] will win (not lose/not win/lose) the championship title as well as the trophy." In contrast, in the "team" condition the message read as follows: "*Your team* [emphasis added] is playing in a tennis tournament and has made it to the finals. You are thinking: By winning (not losing/not winning/losing) this last match, *my team* [emphasis added] will win (not lose/not win/lose) the championship title as well as the trophy."

Results

Product evaluation. We subjected the evaluation of the tennis racquet (Cronbach α = .92) to a 2 × 2 × 2 ANOVA, with the factors Regulatory Orientation of Pleasure Mindsets (gain [self] vs. non-loss [team]) by Regulatory Orientation of Frame (promotion [win and not win] vs. prevention [lose and not lose]) by Hedonic Outcome of Frame (pleasure [win and not lose] vs. pain [lose and not win]). Only the expected three-way interaction was significant (see Figure 4), replicating the data pattern from Experiment 2, $F(1, 184) = 16.72$, $p < .0001$, $\eta^2 = .08$; all other Fs < 1. Separate analyses for the two scenarios follow.

***Ms*$^+$*Fr*$^+$ scenario.** Respondents with a gain (self) mindset evaluated the tennis racquet more favorably under the "win" frame (M = 1.67) than under the "not lose" frame (M = 1.11), $F(1, 184) = 4.76$, $p < .03$, $\eta^2 = .02$. In contrast, respondents with a non-loss (team) mindset evaluated the racquet more favorably under the "not lose" frame (M = 1.57) than under the "win" frame (M = 1.07), $F(1, 184) = 3.85$, $p < .05$, $\eta^2 = .02$. These findings support the regulatory matching effect and replicate the results of our previous experiments for this scenario.

***Ms*$^+$*Fr*$^-$ scenario.** As in Experiments 1c and 2, for this scenario involving mismatched hedonic outcomes, the regulatory matching effect reversed. Respondents with a gain (self) mindset evaluated the racquet more favorably under the "lose" frame (M = 1.65) than under the "not win" frame (M = 1.14), $F(1, 184) = 4.07$, $p < .05$, $\eta^2 = .02$. In contrast, respondents with a non-loss (team) mindset evaluated the racquet more favorably under the "not win" frame (M = 1.47) than under the "lose" frame (M = 0.96), $F(1, 184) = 4.07$, $p < .05$, $\eta^2 = .02$.

Discussion

Experiment 3 replicated the results of Experiment 2, while manipulating pleasure mindsets by activating independent versus interdependent self-views. As in Experiment 2, for pleasure frames (*Ms*$^+$*Fr*$^+$) the regulatory matching effect replicated, whereas for pain frames (*Ms*$^+$*Fr*$^-$) it reversed. Most important, Experiments 2 and 3 obtained the same data pattern with two very different priming procedures whose only commonality is presumably the type of mindset (gain vs. non-loss). This lends further support to our interpretation that it was the regulatory orientation of the mindset, and not some procedural idiosyncrasy, that resulted in the observed data patterns.

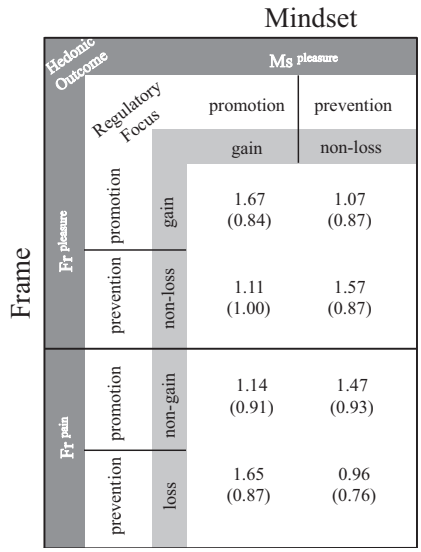

Figure 4. Evaluations of the tennis racquet in Experiment 3 as a function of four message frames (gain, non-gain, loss, and non-loss) by mindset (promotion-pleasure [self] vs. prevention-pleasure [team]). Numbers are means, and in parentheses are standard deviations. Promotion versus prevention orientation of the respondents was manipulated by means of self versus team point of views. Top quadrant: Pleasurable outcome frames (gain vs. non-loss). Bottom quadrant: Painful outcome frames (non-gain vs. loss). Ms = mindset; Fr = frame.

General Discussion

An Empirical Observation: The Regulatory Matching Effect Reversed When the Hedonic Outcome of Mindset and Message Frame Differed

We studied the well-established regulatory matching effect, according to which matching the regulatory focus (promotion vs. prevention) of message frames and of message recipients' mindsets enhances persuasion. We examined if it is also important to consider the hedonic focus of mindsets and frames, that is, their focus on either pleasure or pain. The uniqueness of our research design was to orthogonally vary regulatory focus and "hedonic focus" of both message frame and of recipient's mindset. Thus, we investigated the persuasion consequence of matching frames to mindsets, not only in terms of regulatory focus but also in terms of hedonic focus.

Our novel finding is that the regulatory matching effect in persuasion was reversed when there was hedonic mismatching. We illustrate this effect in Figure 1 by organizing our predictions around four hedonic scenarios. Results across three studies show that regulatory matching enhances persuasion only when mindsets and frames are also hedonically matched, that is, when both are focused on pleasure (see Quadrant 1 in Figure 1), or both are focused on pain (see Quadrant 4 in Figure 1). Most earlier research that documents the

regulatory matching effect falls into Quadrant 1 (e.g., Aaker & Lee, 2001; Cesario et al., 2004; Evans & Petty, 2003; Pham & Avnet, 2004; Wang & Lee, 2006). The regulatory matching effect reversed when mindsets and frames were hedonically mismatched, as represented in Quadrants 2 and 3 in Figure 1, and it was regulatory mismatching that enhanced persuasion. In these scenarios either the mindset was focused on pain, but the frame communicated pleasurable outcomes, or the mindset was focused on pleasure, but the frame communicated painful outcomes. These findings imply that the regulatory matching effect is contingent on hedonic matching. Hedonic matching is a conceptually meaningful boundary condition that has so far not been recognized because previous research did not systematically investigate the moderating influence of a hedonic mismatch between mindsets and frames.

This claim may seem surprising to some readers in light of some well-known regulatory focus studies that manipulated all four outcomes (Crowe & Higgins, 1997; Higgins et al., 2003; Idson et al., 2004). On closer examination, it turns out that some of these studies manipulated only frames but not mindsets (e.g., Idson et al., 2004, except Study 3), some studies manipulated only mindsets but not frames or related stimuli (e.g., Crowe & Higgins, 1997), other studies manipulated both mindsets and frames in terms of regulatory focus, but the stimuli do not allow a clear distinction between hedonic outcomes (e.g., Higgins et al., 2003),[2] and yet other studies manipulated both mindsets and frames in terms of hedonic outcome, but not in terms of regulatory focus (e.g., Idson et al., 2004, Study 3). In order to test how mindsets influence the persuasiveness of different frames and to observe a reversal of the regulatory matching effect, mindsets as well as frames have to be varied independently within the same study at different levels of hedonic outcomes and regulatory focus. However, it is not necessary that a study implement the full design of Figure 1. In fact, our Experiments 2 and 3 did not. What is important is to include the manipulations represented in either Quadrants 2 or 3 of Figure 1 because it is in these two quadrants that the regulatory matching effect reversed.

We should hasten to add that this discussion is not meant to be a critique of the earlier studies, which were designed to test hypotheses other than ours. Nevertheless, we believe it is important to clarify that many studies that appear to have included manipulations involving the four outcomes and that have reported results that at first sight may seem inconsistent with ours, in fact do not map onto our study design, and it is therefore difficult to decide whether their results actually do contradict ours. Our results can be compared to previous ones only if the experimental conditions in previous studies can be mapped onto a quadrant of Figure 1.

Implications for Emotion, Individual Differences, and Decision Making

As we alluded to at the outset of this article, our research can be placed among broader literatures that, like persuasion, invoke positivity and negativity as an important construct, even though the theoretical labels used may not be the same. In these literatures as well, theories typically reduce the four outcomes to two types, but disagree about which types to reduce to. If it turns out that in these other domains both hedonic motivation and regulatory focus motivation are relevant, it would be important to examine their simultaneous impact on associated behaviors. Without a careful study of both motivational dimensions it would not be possible to determine if their influence on behavior is additive, or as we found in the domain of persuasion, is interactive such that one dimension reverses the effect of the other. Although a priori it is not possible for us to make specific predictions, in this section we review literature in the domains of emotions, motivation, and decision making and raise the possibility that in these domains as well multiple motivational dimensions might have an interactive effect on behavior.

Consider research that examines the fundamental dimensions underlying specific emotions. The circumplex model (Feldman Barrett & Russell, 1998) assumes that two orthogonal dimensions, valence and arousal, are fundamental to all emotions. Valence is a bipolar dimension of pleasant versus unpleasant affect, that is, valence corresponds to our hedonic dimension. A competing perspective on emotions (Watson et al., 1999) instead assumes that the two orthogonal dimensions fundamental to emotions are tense arousal versus energetic arousal. Using our language, tense arousal involves a focus on losses versus non-losses, that is, a prevention focus, and energetic arousal involves a focus on gains versus non-gains, that is, a promotion focus. Viewed from the perspective of our research, the question arises whether the two views regarding the fundamental dimensions of emotions need to necessarily compete. Perhaps dimensions from both views underlie emotions. Interestingly, research has shown that assuming an additive influence of two dimensions is insufficient to adequately explain the space of specific emotions (Schimmack & Rainer, 2002) thus allowing for the possibility that these dimensions might interact.

Next, we compare two popular self-report scales to measure individual differences in motivations related to positivity and negativity (see Summerville & Roese, 2008). The Regulatory Focus Questionnaire (Higgins et al., 2001) measures the two regulatory focus motives by assessing the degree to which respondents feel they have reached their ideal goals versus ought goals. These motives map onto gain/non-gain focus (promotion) versus loss/non-loss focus (prevention), respectively. In contrast, the BIS/BAS scales (Carver & White, 1994) assess approach of pleasurable outcomes versus avoidance of painful outcomes, that is, hedonic motives. Although conceptually this maps onto gain/non-gain versus loss/non-loss, the questionnaire items themselves focus on gain versus loss. It is interesting that each of these scales focuses on two motives, when in principle one could conceptualize four motives corresponding to our four mindsets. Thus, for both these scales, our research raises the question whether reducing individual differences in motives to two types might overlook important interaction effects. It may be more fruitful to judiciously combine the two scales, perhaps with some modifications to the scale items, so that the four

[2] In Higgins et al. (2003), it is not possible to determine post hoc the hedonic focus of the mindsets and/or the frames because both pleasure and pain focus were purposely included in the same condition. For instance, the promotion focus frame includes both gain and non-gain language, and the prevention focus frame includes both loss and non-loss language. This was presumably done in order to establish independence of regulatory focus from hedonic focus (or valence) and was therefore perfectly appropriate for the objective of studying regulatory focus in isolation. Moreover, regulatory focus of mindset was measured here, but in a manner that does not distinguish between the hedonic focus on mindsets, such as between mindsets focused on loss versus non-loss (e.g., see Higgins et al., 1997, Studies 3 and 4). Thus, this type of study design also does not allow testing our hypotheses.

motivational mindsets could be distinctly assessed. We are not aware that this has been done, but our results suggest it may be a useful avenue of research. Interestingly, Gray's theory of personality (see Corr, 2004), on which the BIS/BAS scales are based, explicitly incorporates all four types of outcomes.

A third domain where our findings have implications is framing in decision making, and most notably, for situations such as prospect theory's famous Asian Disease Problem. Under the gain frame of this problem, respondents have to choose one of two medical programs to combat a disease that threatens 600 lives, described as (A) saving 200 lives versus (B) saving 600 lives with a 1/3 probability and saving no lives with a 2/3 probability. Tversky and Kahneman (1981) assumed that people construe "no lives saved" (i.e., zero lives) as a neutral reference point and, as a consequence, would construe "lives saved" as gains. The numeric relations between 0, 200, and 600 lives are presumably encoded by a perceptual mechanism that translates these objective numeric quantities into subjective magnitudes in a non-linear fashion. These non-linear magnitude perceptions are at the heart of prospect theory. Now consider two variants of describing program (A): (A2) 400 lives not saved, and (A3) 200 lives saved and 400 lives not saved, as was examined by Kühberger (1995). He observed that these new frames shifted respondents' choices equally toward Program (B) (statistical significance not reported). Although not predicted by prospect theory, this finding need not contradict it because in addition to the reference point effect that skews numeric perceptions, another process based on emotional sensitivities to hedonic outcomes may also be operating (Rottenstreich & Hsee, 2001). That is, in addition to being differentially sensitive to the numeric reference point, people may also be sensitive to the hedonically painful emotional meaning in the frame "lives not saved," lowering the appeal of a choice option explicitly mentioning "lives not saved." Indeed, quite possibly both processes may operate in parallel. If so, considering both processes, the reference point effect and the hedonic meaning effect, together may allow a more complete understanding of decision framing. To understand the effect of hedonic meaning, just like we do in our research, we may need to take into account four types of outcome frames and allow for interactions.

Explaining the Reversal of the Regulatory Matching Effect: The Inhibition–Disinhibition Model

Although the reversal of the regulatory matching effect has been reported in a few prior studies (e.g., Brendl et al., 1995; Tykocinski et al., 1994), as discussed earlier, these studies have either been deemed to be unreliable or too domain specific because of their use of chronic self-discrepancies. Our experiments address these concerns by showing a reversal of the regulatory matching effect even when self-discrepancies are not involved. A natural question is whether our results suggest that defense mechanisms are at work even when people do not have chronic self-discrepancies. Our data rule out this possibility. Consider a person who was primed to have a non-gain mindset. If such a person had engaged in defensive processing to avoid feeling pain from non-gains, she should have been minimally persuaded by a non-gain message, but we found that frame to be maximally persuasive.

Our results, we believe, are the first to seriously challenge current theorizing on the relationship between regulatory focus motivation and hedonic motivation, where the conclusion appears to be that the persuasive advantage of matching frames to mindsets along regulatory orientation holds irrespective of the hedonic outcome involved. That is, current theory assumes a main effect of regulatory focus, whereas we observed a full cross-over interaction with hedonic focus. Moreover, the interaction we observed cannot be readily explained away on statistical grounds. In our view, this robust empirical demonstration is the most important contribution of our research because it requires re-thinking of current theory. The challenge for any new theory would be to explain the entire set of situations depicted in Figure 1.

The inhibition–disinhibition model we present offers a plausible explanation for the complete cross-over interaction between the hedonic focus and regulatory focus of mindsets and frames. Although the IDM seems to adequately account for our data, it is subject to some criticism. First, it is not precise about the effects of dis-inhibition. It would seem reasonable to assume that the dis-inhibited frame, although being fluently processed, would not reach an equally high level of fluency as the frame that is directly activated by the primed mindset. However, our persuasion data do not reveal this subtle difference. This data pattern by itself does not contradict the IDM because it may have resulted from low measurement sensitivity. Moreover, it is theoretically possible that dis-inhibition could reach the same level of accessibility as direct activation.

Another critique questions whether lateral inhibition, and in turn, dis-inhibition, is applicable to persuasion. Lateral inhibition has been used to model language, memory, perception, attention, and decision making, and is common in connectionist modeling (see Anderson & Spellman, 1995), but it is typically not used to model attitudes or preferences (for an exception, see Martindale & Moore, 1988). One reason for this may be that attitude research is historically situated in a social cognition tradition, which invokes the computer as the analogy of the mind. For computers, dis-inhibition is indeed an unnatural process. However, if the brain were used as the analogy of the mind, as is common in cognitive psychology, lateral inhibition would be quite natural (Carpenter & Blakemore, 1973; Usher & McClelland, 2001). Lateral inhibition is useful for modeling mechanisms that resolve competition and lead to cognitive selection. In our context, specific mindsets activate specific goals, and it seems reasonable that there is conflict between some goals because they are linked to conflicting behavioral responses (e.g., approach vs. avoidance), or to conflicting physiological responses (e.g., high vs. low arousal). Without inhibition, a primed mindset would not only activate the relevant goal, but also related, but conflicting goals. Lateral inhibition is particularly well-suited for resolving such goal conflict. Dis-inhibition may simply be an emergent property of the lateral inhibition architecture.

In light of these potential concerns about the IDM, we next discuss the relative merits of plausible alternative explanations. Where an existing theory requires additional assumptions, we make them in a manner that allows the respective theory to account for our results, even though these assumptions may appear contradictory across different theories. We make the assumptions in the spirit of being as "generous" as possible to each theory, not because we favor them.

Alternative Explanations of the Reversal of the Regulatory Matching Effect

Regulatory focus theory. Regulatory focus theory considers promotion and prevention orientations to be approach motivations because they "seek" positive outcomes, that is, gains or non-losses (Higgins, 1997, p. 1282; Higgins, 1998, pp. 6–7; Higgins, 2012, p. 25; see also Summerville & Roese, 2008). Accordingly, prior evidence shows that a promotion orientation makes people more sensitive to gains than to non-losses, whereas a prevention orientation makes them more sensitive to non-losses than to gains. Further, messages that match the regulatory orientation of an individual are more persuasive than messages that mismatch, resulting in gain (non-loss) framed messages being more persuasive for gain (non-loss) mindsets (Aaker & Lee, 2001; Cesario et al., 2004; Evans & Petty, 2003; Lee et al., 2000). These results describe the scenario in Quadrant 1 (see Figure 1) where frames and mindsets are focused on pleasurable outcomes.

The theory does not seem to make different predictions for mindsets or frames that are focused on painful outcomes. In fact, the theory has assumed that the mindset of a promotion oriented person is equally focused on gains and non-gains, whereas that of a prevention orientated person is equally focused on losses and non-losses (e.g., Pham & Higgins, 2005). Consistent with this view, the most common way of implementing regulatory orientation when framing messages has been to combine gain and non-gain frames into one promotion frame and loss and non-loss frames into one prevention frame (e.g., Higgins et al., 2003). Based on this view, if we were to extend regulatory focus theory to messages that highlight painful outcomes, the prediction is likely to be that individuals who are promotion-oriented would be persuaded more by non-gains than by losses, and those who are prevention-oriented would be persuaded more by losses than by non-gains. However, our findings reveal the opposite pattern. Not distinguishing between hedonically opposed mindsets within a particular regulatory orientation is the reason why regulatory focus theory is unable to explain our findings.[3]

Regulatory fit theory. An alternate account for our findings can be developed based on regulatory fit theory (Higgins, 2000), which is the metacognitive extension of regulatory focus theory. Regulatory fit theory posits that when the means of goal pursuit sustain a goal (or a mindset; Cesario et al., 2004), this type of match creates a metacognitive feeling of "fit," where whatever it is that people happen to be thinking of momentarily feels more "right" (i.e., more valid, or more relevant), compared to when there is less fit. In a persuasion setting, fit results from compatibility between the regulatory orientation of a person and the means of goal pursuit inherent in a message. Specifically, gain/non-gain messages are thought to fit a promotion orientation, and non-loss/loss messages to fit a prevention orientation.

Regulatory fit theory postulates an amplification process for persuasion (Avnet & Higgins, 2006), such that the feeling of fit amplifies whatever initial response is prompted by a persuasive message. A message about a pleasurable outcome should prompt an initial pleasant feeling, and it seems reasonable that the theory would assume that a message about a painful outcome would prompt an initial painful feeling. When there is fit between the regulatory orientation of the message recipient and the message frame, the initial feeling about the message would be perceived to be "more right." Thus, as a result of experiencing fit, an initial pleasant feeling should increase persuasion, whereas an initial painful feeling should decrease it.

With these assumptions in mind, consider the scenario with painful mindsets and pleasure frames ($Ms^{-}Fr^{+}$), where the regulatory matching effect reversed. According to regulatory fit theory, the initial pleasant feelings prompted by the gain framed message should amplify under the fitting non-gain mindset leading to greater persuasion, compared to the loss mindset, and the initial pleasant feelings prompted by the non-loss message should amplify under the fitting loss mindset leading to greater persuasion, compared to the non-gain mindset. Our results however, show exactly the opposite pattern, implying that the theory is unable to explain our data when mindsets were focused on painful outcomes.

Regulatory fit theory has, however, made an additional assumption about how regulatory orientations relate to hedonic outcomes. Idson et al. (2004) theorized that "anticipating a positive outcome sustains or fits a promotion state . . . , whereas anticipating a

[3] It should be pointed out that some accounts of regulatory focus theory do assume different hedonic focus, depending on the level of abstraction of the goal involved. Specifically, these accounts assume a goal system with needs represented at more abstract "general system level" and strategies represented at a less abstract "strategic level." Further, "Self-regulation in relation to either ideal [promotion] or ought self-guides [prevention] is discrepancy reducing and involves approach at the general system level" (Crowe & Higgins, 1997, p. 118, our addition in brackets), implying that at the "system level," prevention orientation elicits a non-loss mindset (Shah et al., 1998). In contrast, at the "strategic level," the "movement toward desired end states (either safety or accomplishment) can be executed through strategies of either approaching matches to these end states [promotion] or avoiding mismatches to these end states [prevention]" (Shah et al., 1998, p. 289, our additions in brackets), implying that prevention orientation could also elicit a loss mindset. Note, however, that even these accounts do not assume that there are distinct pleasurable versus painful mindsets within one regulatory orientation. Only with such a distinction could regulatory focus theory explain our results.

[4] Here, we consider two additional intriguing explanations for our data, although our studies were not explicitly designed to test them. One explanation we label the *affirmation-negation hypothesis*. The astute reader may have noticed that the four types of outcomes conceptually involve either affirmation (gains, losses) or negation (non-gains, non-losses) (see also Brendl et al., 1995). Further, note that matching frames to mindsets such that both are affirmative or both are negated corresponds to increases in persuasiveness (large *ms* and *mm*s in Figure 1). Specifically, affirmative frames (gains and losses) were more persuasive when the mindsets also implied affirmation (gain and loss mindsets), and negated frames (non-gains and non-losses) were more persuasive when the mindsets also implied negation (non-gain and non-loss mindsets). This conceptualization raises the possibility that when a mindset and message frame share an affirmation or a negation schema, the message is processed more fluently, leading to greater persuasion. Despite its elegance, this explanation cannot account for all of our findings. Consider Experiment 3. It seems unlikely that playing for a team (non-loss mindset) would activate a negation schema any more than playing for oneself (gain mindset). Further, in Experiment 1 for the affirmation-negation hypothesis to hold, we would have to argue that the non-loss frame, "HeartSafe," activates a negation schema, even though at a semantic level we phrased it in an affirmative manner. Yet, might the schema associated with safety involve negation? While possible, this is a yet an untested assumption. Similarly, the loss frame, "LoCholes," would have to invoke an affirmation schema, even though it includes very explicit semantic negations (e.g., unsafe, excluding) and verbs that symbolize negation (e.g., lowering cholesterol, excluding). Nevertheless, affirmation-negation at the level of schemata remains a possibility.

(*footnote continues*)

negative outcome sustains or fits a prevention state" (p. 927). This assumption could account for some of our novel observations, but not for all of them. For instance, according to this view priming a prevention mindset by means of a non-loss prime should still render a loss frame more persuasive than a non-gain frame. But we found the opposite.[4]

Theoretical Implications

Our main finding is a reversal of the regulatory matching effect in the domain of persuasion when there is a hedonic mismatch. This finding has a number of theoretical implications. First, it is apparent that current theorizing about the influence of regulatory focus on persuasion does not adequately account for the moderating role of hedonic focus. One exception is the IDM, which differs from other accounts by invoking knowledge inhibition and disinhibition processes. These low-level cognitive processes could be an input to the higher level meta-cognitive processes involved in theories such as regulatory fit. Thus, these two types of processes may not necessarily be competing explanations because they may be situated at different levels of analysis. In addition, the arousal matching mechanism (cf. Footnote 4) offers an intriguing explanation for our data pattern by invoking activation rather than inhibition processes. In contrast, the accounts based on regulatory focus theory and regulatory fit theory do not explain the interaction between hedonic outcomes and regulatory orientation. However, by developing additional assumptions, these theories may well be able to explain our data. Determining which one or more of these processes operate will require independent testing of the unique assumptions that each account makes. This will have to be done using a conceptual design of four mindsets by four frames. In such testing, it would not be sufficient to simply provide support for one mechanism, but it would also be necessary to empirically rule out potential competing explanations. Although this is a major undertaking, our hope is that the robust data pattern we have documented here would motivate such research.

Another important avenue for future research is to test the boundary conditions of the data pattern we have found. Our research focused only on persuasion situations with evaluation of a target object as the main dependent variable, but not on attitude toward the object itself. This distinction may be particularly relevant for messages that highlight painful connotations, that is, warnings, which often include an undesirable focal object, such as an infectious virus, and attempt to persuade us to avoid this object or to take corrective action against it. This means that a persuasive warning message would result in greater agreement that action against the negative object is appropriate, and would most likely be accompanied by a more negative attitude toward the object itself. This is unlike a message that recommends a desirable object (most product advertising is of this sort), where a persuasive message would lead to agreement that the object is to be approached, accompanied with a more positive attitude toward the object itself. It is important to note that our predictions pertain to message persuasiveness, and not to positive attitudes toward the focal object.

There also exist data outside of the domain of persuasion that could post hoc be interpreted in a manner consistent with the IDM predictions for message persuasiveness. These data pertain to assessing utility functions of money (Brendl et al., 1995), choices between consumer products (Sela & Shiv, 2009), and perceptions of health risks (Agrawal, Menon, & Aaker, 2007). Nevertheless, it remains an open question if similar data patterns would be observed for motivational persistence, or other behavioral measures. This is important because some articles not in the persuasion context report results that seem consistent with the regulatory matching effect even for conditions where hedonic outcomes are mismatched (Crowe & Higgins, 1997; Förster, Higgins, & Idson, 1998, Experiment 2; Higgins & Tykocinski, 1992; Idson et al., 2004; Lee et al., 2000, Study 4). These results raise the possibility that there may well be other moderators and boundary conditions to the reversal effect itself. Data reported in Sela and Shiv (2009) suggest one potential moderator. These data could be explained from the perspective of the IDM, but only when respondents made their choice immediately after priming mindsets and message exposure, presumably basing their choice on accessibility. When they made their choice 5 minutes later, presumably basing their choice on motivations, the results are more consistent with the regulatory matching effect. This interpretation of the data raises the possibility that the IDM may be more predictive when people rely on accessibility to guide their behavior and regulatory matching may be more predictive when they rely on motivational tendencies.

The interaction we observed between regulatory focus and hedonic focus underscores Higgins's (1997) original proposition that regulatory focus motives are distinct from hedonic motives (i.e., motives to approach pleasure/avoid pain). In our opinion, the literature has been inconsistent in how it regards the relationship between these two motivational constructs. On the one hand, by now the distinctness of these motivational constructs seems to be taken for granted and therefore regulatory focus is viewed as a construct different from hedonic approach/avoidance motivation. On the other hand, the operationalization of regulatory focus sometimes does not reflect this distinction and could be interpreted as the operationalization of approach/avoidance motivation, which has led some researchers

[4] (*continued*) Another plausible explanation we label the *arousal-matching hypothesis*. The starting point for this hypothesis is that the four types of outcomes (gains, etc.) involve unique emotional experiences. The types of emotional experiences are as follows: for *gains*, cheerfulness and joy; for *non-gains*, dejection and disappointment; for *losses,* anxiety and agitation; for *non-losses,* relief and calmness (Higgins, 1987; Roseman, 1984, 2008). According to one view, an important part of the phenomenological experience of specific emotions is their level of arousal (Yik, Russell, & Steiger, 2011). Different types of emotions are characterized by different levels of arousal (Lang, 1995; Plutchik, 1991; Russell, 1980, 2003). Gain emotions (e.g., joy) feel more arousing than non-gain emotions (e.g., disappointment), and loss emotions (e.g., upset) feel more arousing than non-loss emotions (e.g., relief) (Carver & Scheier, 1998; Higgins, 1987; Roseman, 2008; Strauman & Higgins, 1987). This raises the possibility that arousal could be a mechanism that could explain our data. Specifically, the mental representations of the four types of outcomes could include their levels of arousal. A message would be processed more fluently, and be more persuasive, if the representation of arousal primed by the mindset is compatible with the arousal implied by the message frame (i.e., both are high or both are low). In Figure 1, all cells that resulted in superior persuasion (large *m*s and *mm*s) are those where mindset and frame should have similar levels of arousal. Our data pattern is therefore consistent with this arousal-matching hypothesis. Yet, as we discussed above, there are unresolved disagreements about the validity of the construct of emotional arousal as just outlined (Watson et al., 1999).

to implicitly equate the two constructs (for a discussion, see Summerville & Roese, 2008). This is particularly the case with treating prevention orientation as being the same as hedonic avoidance motivation. The distinction between regulatory focus and hedonic motives is not merely a semantic one. One construct reverses the effect of the other, and both constructs are required to explain our results. Thus, in our view our data provide the strongest and unequivocal evidence to date that these motivations should be considered separate constructs. We manipulated these constructs in multiple ways, demonstrating convergence across operationalizations. The reversal of the regulatory matching effect is visible to the "naked eye" without requiring sophisticated statistical techniques or complex measures. The manipulations are also straightforward, minimizing room for multiple interpretations. The interaction we report shows that the effect of regulatory focus on persuasion cannot be theoretically understood without considering hedonic focus as well.

Applied Implications

Framing is an experimental research technique that carefully varies one aspect of a stimulus while holding all others constant (Keren, 2010). It has real-world analogs—for instance, when a communicator chooses to highlight one of several possible aspects of a message, for example, with the intent of either recommending a particular behavior or of warning against engaging in a behavior. Specifically, the message may highlight the pleasurable consequences of engaging in a desirable behavior (e.g., health benefits of using a nicotine patch instead of smoking), or the pleasurable consequences of not engaging in an undesirable behavior (e.g., health benefits of not smoking), or the painful consequences of engaging in an undesirable behavior (e.g., health risks of smoking), or the painful consequences of not engaging in a desirable behavior (e.g., health risks of not using a nicotine patch). Whether the message is a recommendation or a warning, its persuasiveness would depend on the mindset of the message recipient, which in the real world could be any one of the four mindsets we examined.

According to current theory, a communications practitioner should craft a message such that its regulatory orientation matches that of the recipient. This matching strategy is conceptually a main effect prediction in that the communicator only needs to take into account one variable, regulatory orientation, and can ignore hedonic outcomes in the message (or treat that variable as an additional main effect). In contrast, according to our theorizing, we recommend regulatory matching as a persuasion strategy only when mindsets and messages focus on the same hedonic outcome. This regulatory matching strategy would backfire if one is focused on pleasure and the other on pain. In this situation, choosing a message whose regulatory orientation mismatches that of the recipient's mindset would be more persuasive. Thus, the communicator needs to be cognizant of the hedonic outcome that messages and mindsets focus on, in addition to their regulatory orientation. In times of personal or societal crisis, mindsets may focus on pain, reversing the effect that regulatory matching may have at other times.

References

Aaker, J. L., & Lee, A. Y. (2001). "I" seek pleasures and "we" avoid pains: The role of self-regulatory goals in information processing and persuasion. *Journal of Consumer Research, 28,* 33–49. doi:10.1086/321946

Agrawal, N., Menon, G., & Aaker, J. L. (2007). Getting emotional about health. *Journal of Marketing Research, 44,* 100–113. doi:10.1509/jmkr.44.1.100

Anderson, M. C., & Spellman, B. (1995). On the status of inhibitory mechanisms in cognition: Memory retrieval as a model case. *Psychological Review, 102,* 68–100. doi:10.1037/0033-295X.102.1.68

Avnet, T., & Higgins, E. T. (2006). How regulatory fit affects value in consumer choices and opinions. *Journal of Marketing Research, 43,* 1–10. doi:10.1509/jmkr.43.1.1

Bosmans, A., & Baumgartner, H. (2005). Goal-relevant emotional information: When extraneous affect leads to persuasion and when it does not. *Journal of Consumer Research, 32,* 424–434. doi:10.1086/497554

Brendl, C. M., Higgins, E. T., & Lemm, K. M. (1995). Sensitivity to varying gains and losses: The role of self-discrepancies and event framing. *Journal of Personality and Social Psychology, 69,* 1028–1051. doi:10.1037/0022-3514.69.6.1028

Brockner, J., Paruchuri, S., Idson, L. C., & Higgins, E. T. (2002). Regulatory focus and the probability estimates of conjunctive and disjunctive events. *Organizational Behavior and Human Decision Processes, 87,* 5–24. doi:10.1006/obhd.2000.2938

Carpenter, R. H. S., & Blakemore, C. (1973). Interactions between orientations in human vision. *Experimental Brain Research, 18,* 287–303. doi:10.1007/BF00234599

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. doi:10.1017/CBO9781139174794

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67,* 319–333. doi:10.1037/0022-3514.67.2.319

Cesario, J., Corker, K. S., & Jelinek, S. (2013). A self-regulatory framework for message framing. *Journal of Experimental Social Psychology, 49,* 238–249. doi:10.1016/j.jesp.2012.10.014

Cesario, J., Grant, H., & Higgins, E. T. (2004). Regulatory fit and persuasion: Transfer from "feeling right". *Journal of Personality and Social Psychology, 86,* 388–404. doi:10.1037/0022-3514.86.3.388

Corr, P. J. (2004). Reinforcement sensitivity theory and personality. *Neuroscience & Biobehavioral Reviews, 28,* 317–332. doi:10.1016/j.neubiorev.2004.01.005

Crowe, E., & Higgins, E. T. (1997). Regulatory focus and strategic inclinations: Promotion and prevention in decision making. *Organizational Behavior and Human Decision Processes, 69,* 117–132. doi:10.1006/obhd.1996.2675

Evans, L. M., & Petty, R. E. (2003). Self-guide framing and persuasion: Responsibly increasing message processing to ideal levels. *Personality and Social Psychology Bulletin, 29,* 313–324. doi:10.1177/0146167202250090

Feldman Barrett, L., & Russell, J. A. (1998). Independence and bipolarity in the structure of affect. *Journal of Personality and Social Psychology, 74,* 967–984. doi:10.1037/0022-3514.74.4.967

Förster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and avoidance strength during goal attainment: Regulatory focus and the "goal looms larger" effect. *Journal of Personality and Social Psychology, 75,* 1115–1131. doi:10.1037/0022-3514.75.5.1115

Freitas, A. L., & Higgins, E. T. (2002). Enjoying goal-directed action: The role of regulatory fit. *Psychological Science, 13,* 1–6. doi:10.1111/1467-9280.00401

Gray, J. (1971). *The psychology of fear and stress*. New York, NY: McGraw-Hill.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94,* 319–340. doi:10.1037/0033-295X.94.3.319

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist, 52,* 1280–1300. doi:10.1037/0003-066X.52.12.1280

Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. *Advances in Experimental Social Psychology, 30,* 1–46. doi:10.1016/S0065-2601(08)60381-0

Higgins, E. T. (2000). Making a good decision: Value from fit. *American Psychologist, 55,* 1217–1230. doi:10.1037/0003-066X.55.11.1217

Higgins, E. T. (2002). How self-regulation creates distinct values: The case of promotion and prevention decision-making. *Journal of Consumer Psychology, 12,* 177–191. doi:10.1207/S15327663JCP1203_01

Higgins, E. T. (2012). *Beyond pleasure and pain: How motivation works*. Oxford, England: Oxford University Press.

Higgins, E. T., Friedman, R. S., Harlow, R. E., Idson, L. C., Ayduk, O. N., & Taylor, A. (2001). Achievement orientations from subjective histories of success: Promotion pride versus prevention pride. *European Journal of Social Psychology, 31,* 3–23. doi:10.1002/ejsp.27

Higgins, E. T., Idson, L. C., Freitas, A. L., Spiegel, S., & Molden, D. C. (2003). Transfer of value from fit. *Journal of Personality and Social Psychology, 84,* 1140–1153. doi:10.1037/0022-3514.84.6.1140

Higgins, E. T., Roney, C., Crowe, E., & Hymes, C. (1994). Ideal versus ought predilections for approach and avoidance: Distinct self-regulatory systems. *Journal of Personality and Social Psychology, 66,* 276–286. doi:10.1037/0022-3514.66.2.276

Higgins, E. T., Shah, J., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology, 72,* 515–525. doi:10.1037/0022-3514.72.3.515

Higgins, E. T., & Tykocinski, O. (1992). Self-discrepancies and biographical memory: Personality and cognition at the level of psychological situation. *Personality and Social Psychology Bulletin, 18,* 527–535. doi:10.1177/0146167292185002

Idson, L. C., Liberman, N., & Higgins, E. T. (2000). Distinguishing gains from nonlosses and losses from nongains: A regulatory focus perspective on hedonic intensity. *Journal of Experimental Social Psychology, 36,* 252–274. doi:10.1006/jesp.1999.1402

Idson, L. C., Liberman, N., & Higgins, E. T. (2004). Imagining how you'd feel: The role of motivational experiences from regulatory fit. *Personality and Social Psychology Bulletin, 30,* 926–937. doi:10.1177/0146167204264334

Keren, G. (2010). On the definition and possible underpinnings of framing effects: A brief review and a critical evaluation. In G. Keren (Ed.), *Perspectives on framing* (pp. 3–34). New York, NY: Psychology Press.

Kühberger, A. (1995). The framing of decisions: A new look at old problems. *Organizational Behavior and Human Decision Processes, 62,* 230–240. doi:10.1006/obhd.1995.1046

Labroo, A. A., & Lee, A. Y. (2006). Between two brands: A goal fluency account of brand evaluation. *Journal of Marketing Research, 43,* 374–385. doi:10.1509/jmkr.43.3.374

Lang, P. J. (1995). The emotion probe. *American Psychologist, 50,* 372–385. doi:10.1037/0003-066X.50.5.372

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,* 205–218. doi:10.1037/0022-3514.86.2.205

Lee, A. Y., Aaker, J. L., & Gardner, W. L. (2000). The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus. *Journal of Personality and Social Psychology, 78,* 1122–1134. doi:10.1037/0022-3514.78.6.1122

Lewin, K. (1926). Vorsatz, Wille und Bedtirfnis [Intention, will, and need]. *Psychologische Forschung, 7,* 330–385. doi:10.1007/BF02424365

Lewin, K. (1935). *A dynamic theory of personality*. New York, NY: McGraw-Hill.

Liberman, N., Molden, D. C., Idson, L. C., & Higgins, E. T. (2001). Promotion and prevention focus on alternative hypotheses: Implications for attributional functions. *Journal of Personality and Social Psychology, 80,* 5–18. doi:10.1037/0022-3514.80.1.5

Malaviya, P., & Sternthal, B. (2009). Parity product features can enhance or dilute brand evaluation: The influence of goal orientation and presentation format. *Journal of Consumer Research, 36,* 112–121. doi:10.1086/595717

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98,* 224–253. doi:10.1037/0033-295X.98.2.224

Martindale, C., & Moore, K. (1988). Priming, prototypicality, and preference. *Journal of Experimental Psychology: Human Perception and Performance, 14,* 661–670. doi:10.1037/0096-1523.14.4.661

Molden, D. C., Lee, A. Y., & Higgins, E. T. (2008). Motivations for promotion and prevention. In J. Y. Shah & W. L. Gardner (Eds.), *Handbook of motivation science* (pp. 169–187). New York, NY: Guilford Press.

Mowrer, O. H. (1960). *Learning theory and behavior*. doi:10.1037/10802-000

O'Reilly, R. C., & Munakata, Y. (2000). *Computational explorations of cognitive neuroscience: Understanding the mind by simulating the brain*. Cambridge, MA: MIT Press.

Pham, M. T., & Avnet, T. (2004). Ideals and oughts and the reliance on affect versus substance in persuasion. *Journal of Consumer Research, 30,* 503–518. doi:10.1086/380285

Pham, M. T., & Higgins, E. T. (2005). Promotion and prevention in consumer decision making: The state of the art and theoretical propositions. In S. Ratneshwar & D. G. Mick (Eds.), *Inside consumption: Frontiers of research on consumer motives, goals, and desires* (pp. 8–43). London, England: Routledge.

Plutchik, R. (1991). *The emotions*. Lanham, MD: University Press of America.

Roseman, I. J. (1984). Cognitive determinants of emotion: A structural theory. In P. Shaver (Ed.), *Review of personality and social psychology: Relationships and health* (Vol. 5, pp. 11–36). Beverly Hills, CA: Sage.

Roseman, I. J. (2008). Motivations and emotivations: Approach, avoidance, and other tendencies in motivated and emotional behavior. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation* (pp. 343–366). New York, NY: Psychology Press.

Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: The role of message framing. *Psychological Bulletin, 121,* 3–19. doi:10.1037/0033-2909.121.1.3

Rottenstreich, Y., & Hsee, C. K. (2001). Money, kisses, and electric shocks: On the affective psychology of risk. *Psychological Science, 12,* 185–190. doi:10.1111/1467-9280.00334

Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology, 39,* 1161–1178. doi:10.1037/h0077714

Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review, 110,* 145–172. doi:10.1037/0033-295X.110.1.145

Schimmack, U., & Rainer, R. (2002). Experiencing activation: Energetic arousal and tense arousal are not mixtures of valence and activation. *Emotion, 2,* 412–417. doi:10.1037/1528-3542.2.4.412

Sela, A., & Shiv, B. (2009). Unraveling priming: When does the same prime activate a goal versus a trait? *Journal of Consumer Research, 36,* 418–433. doi:10.1086/598612

Shah, J., Higgins, E. T., & Friedman, R. S. (1998). Performance incentives and means: How regulatory focus influences goal attainment. *Journal of Personality and Social Psychology, 74,* 285–293. doi:10.1037/0022-3514.74.2.285

Spratling, M. W., & Johnson, M. H. (2002). Preintegration lateral inhibition enhances unsupervised learning. *Neural Computation, 14,* 2157–2179. doi:10.1162/089976602320264033

Strauman, T. J., & Higgins, E. T. (1987). Automatic activation of self-discrepancies and emotional syndromes: When cognitive structures influence affect. *Journal of Personality and Social Psychology, 53,* 1004–1014. doi:10.1037/0022-3514.53.6.1004

Summerville, A., & Roese, N. J. (2008). Self-report measures of individual differences in regulatory focus: A cautionary note. *Journal of Research in Personality, 42,* 247–254. doi:10.1016/j.jrp.2007.05.005

Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review, 96,* 506–520. doi:10.1037/0033-295X.96.3.506

Tversky, A., & Kahneman, D. (1981, January 30). The framing of decisions and the psychology of choice. *Science, 211,* 453–458. doi:10.1126/science.7455683

Tykocinski, O., Higgins, T. E., & Chaiken, S. (1994). Message framing, self-discrepancies, and yielding to persuasive messages: The motivational significance of psychological situations. *Personality and Social Psychology Bulletin, 20,* 107–115. doi:10.1177/0146167294201011

Usher, M., & McClelland, J. L. (2001). The time course of perceptual choice: The leaky, competing accumulator model. *Psychological Review, 108,* 550–592. doi:10.1037/0033-295X.108.3.550

Wang, J., & Lee, A. Y. (2006). The role of regulatory focus in preference construction. *Journal of Marketing Research, 43,* 28–38. doi:10.1509/jmkr.43.1.28

Watson, D., Wiese, D., Vaidya, J., & Tellegen, A. (1999). The two general activation systems of affect: Structural findings, evolutionary considerations, and psychobiological evidence. *Journal of Personality and Social Psychology, 76,* 820–838. doi:10.1037/0022-3514.76.5.820

Yik, M., Russell, J. A., & Steiger, J. H. (2011). A 12-point circumplex structure of core affect. *Emotion, 11,* 705–731. doi:10.1037/a0023980

Appendix A

Advertisement for Poonga Juice in Experiment 1

All Frames

Welcome to Poonga Juice!

At Poonga Juice, we are 100% committed to you, your health and your happiness. Our goal is simple: to share the natural wonder and flavor of fruit with you. We promise to give you the freshest, most "fruitfilling" experience! Come into one of our stores and try a Poonga Juice from a wide variety of wholesome, 100% natural juices, filled with goodness and made from the highest quality ingredients.

Exciting new medical research by the United States Department of Agriculture has shown that compared to fruit-based beverages, a carefully prepared blend of 100% natural fruit juices can contain more than three times the vitamins and minerals, as well as valuable plant extracts and antioxidants, that we need every day.

Frame: Promotion-Pleasure or Gain Outcome

Want to feel more energized? Try our **EnergyBoost** juice. It contains 100% natural peaches, blueberries and oranges, and gives you a range of B vitamins and added Zinc.

Including the **EnergyBoost** juice in your diet would allow your body to reach its peak mental and physical energy potential and make you feel full of energy throughout the day.

EnergyBoost!

Frame: Promotion-Pain or Non-Gain Outcome

Do you feel drained of energy? Try our **ReEnergy** juice. It contains 100% natural peaches, blueberries, and oranges, and gives you a range of B vitamins and added Zinc.

Excluding the **ReEnergy** juice from your diet would deprive your body from reaching its peak mental and physical energy potential and could make you feel drained of energy through the day.

ReEnergy!

Frame: Prevention-Pleasure or Non-Loss Outcome

Want to keep your heart safe? Try our **HeartSafe** juice. It contains 100% natural peaches, blueberries, and oranges, and gives you a range of B vitamins and added Zinc.

Including **HeartSafe** in your diet would help keep you safe from cholesterol and plaque build-up, and could greatly improve your heart's natural immunity.

HeartSafe!

Frame: Prevention-Pain or Loss Outcome

Concerned your heart is unsafe? Try our **LoCholes** juice. It contains 100% natural peaches, blueberries, and oranges, and gives you a range of B vitamins and added Zinc.

Excluding **LoCholes** juice from your diet could increase the risk of cholesterol absorption and plaque build-up, and could greatly weaken your heart's natural immunity.

LoCholes!

All Frames

Visit your nearest Poonga Juice store.

(*Appendices continue*)

Appendix B

Tennis Racquet Advertisement Used in Experiments 2 and 3

The text in brackets shows the parts of the text that differed between message frames.

Self-Version (Experiments 2 and 3)

You are playing in a tennis tournament and have made it to the finals. You are thinking to yourself: By [winning/not winning/not losing/losing] this last match, I will [win/not win/not lose/lose] the championship title as well as the huge trophy.

It is 14:26 hours. The sun is beating down on you. You bounce the ball a few times and adjust the strings on your Star tennis racquet.

The new "Star" tennis racquet is of the highest quality—created that way based on certain important attributes. First, the weight is light, and optimally distributed to be heavier on the sides of the frame, which means that Star tennis racquets allow you to hit solid, powerful returns and serves. Also, the size of the "sweet" spot is considerably larger than most competing brands, allowing you to hit with both power and accuracy. Finally, its shock absorbers are made of a new technology patented by Lycra, and therefore are uniquely able to eliminate vibrations that lead to tennis elbow and other arm-related injuries.

Remember: By [winning/not winning/not losing/losing] this last match, you will [win/not win/not lose/lose] the championship title as well as the trophy. Better use a Star tennis racquet.

Team Version (Experiment 3)

Your team is playing in a tennis tournament and has made it to the finals. You are thinking to yourself: By [winning/not winning/not losing/losing] this last match, my team will [win/not win/not lose/lose] the championship title as well as the huge trophy.

It is 14:26 hours. The sun is beating down on you. You bounce the ball a few times and adjust the strings on your Star tennis racquet.

The new "Star" tennis racquet is of the highest quality—created that way based on certain important attributes. First, the weight is light, and optimally distributed to be heavier on the sides of the frame, which means that Star tennis racquets allow you to hit solid, powerful returns and serves. Also, the size of the "sweet" spot is considerably larger than most competing brands, allowing you to hit with both power and accuracy. Finally, its shock absorbers are made of a new technology patented by Lycra, and therefore are uniquely able to eliminate vibrations that lead to tennis elbow and other arm-related injuries.

Remember: By [winning/not winning/not losing/losing) this last match, my team will [win/not win/not lose/lose] the championship title as well as the huge trophy. Better use a Star tennis racquet.

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