

STRUCTURED VERSUS UNSTRUCTURED REGULATION: ON PROCEDURAL MINDSETS AND THE MECHANISMS OF PRIMING EFFECTS

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We propose that two distinct regulatory dynamics may produce social psychological priming effects, but under very different conditions. When engaged in structured regulation, people process information in light of their valued goals, responding to salient situational cues only to the extent that those cues are goal-relevant. By contrast, when engaged in unstructured regulation, people are more tuned to the demands of the present, tailoring their responses to the unique circumstances of the immediate context and evincing a greater openness to responding to salient cues in a cue-consistent manner. We explore construal level as one factor that dictates when people engage in one dynamic versus the other. We also discuss the distinction between traditional priming and mindset priming.

Priming represents one of the most studied judgmental and behavioral phenomena in social cognition research. “Priming effects” refer to the cognitive, motivational, affective, and behavioral consequences of subtly enhancing the accessibility of a given construct independent of either available cognitive resources, awareness of this influence, or control over this influence (see Molden, 2014, this issue). Accessibility is the ease and speed with which a cognitive construct or process is activated and comes to mind (e.g., Bruner, 1957; Higgins, 1996). Determinants of accessibility include the frequency and recency of activation as well as the goals and motives of the individual (Bruner, 1957). Priming research is based on the

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notion that exposure to a stimulus makes some constructs or processes temporarily more accessible, which in turn enhances their influence on thoughts, feelings, and behavior (e.g., Higgins, 1996). In the most dramatic demonstrations of priming, situational cues that make a construct more accessible (e.g., exposing people to stereotypes about the elderly) lead to changes in behavior (e.g., walking more slowly; Bargh, Chen, & Burrows, 1996; for reviews, see Dijksterhuis & Bargh, 2001; Wheeler & Petty, 2001).

Several recent highly publicized failures to replicate some priming effects—particularly those that demonstrate their impact on behavior—have led many to question their reliability (e.g., Doyen, Klein, Pichon, & Cleeremans, 2012; Shanks et al., 2013). Following the lead of others (e.g., Cesario, Plaks, & Higgins, 2006; Eitam & Higgins, 2010; Loersch & Payne, 2011, 2014, this issue; Wheeler, DeMarree, & Petty, 2007, 2014, this issue), we propose that more needs to be done to understand the active “ingredients” in priming effects and how these ingredients operate and interact. We suggest that researchers need to devote greater attention to the self-regulatory concerns participants have, and whether and how these concerns influence people’s interpretation or construal of the priming context. When presented with priming stimuli, participants must ask themselves, implicitly or explicitly, “What is it?” and “How do I want to respond?” We propose that how people address these two questions determines the outcome of priming experiments.

We distinguish two regulatory dynamics that determine how people address these questions. These dynamics constitute the ends of a theoretical continuum. People may engage in more structured regulation whereby they impose interpretations of situations based on their valued goals in top-down fashion, striving to maintain goal-consistency in their judgments, decisions, and behavior (see also Fujita, Trope, Cunningham, & Liberman, 2014). Alternatively, people may engage in more unstructured regulation whereby they construct event construals in a bottom-up fashion, taking cues from and tailoring their psychological and behavioral responses to the immediate demands of the present. Both regulatory dynamics may produce priming effects, but under very different circumstances and for very different reasons. We suggest that understanding when and why one might expect to produce a priming effect in the lab (and presumably in the “wilds” outside the lab) requires appreciation of these two dynamics. Before delving into greater detail of our theoretical approach, however, we briefly review the priming literature.

TRADITIONAL PRIMING EFFECTS

Traditional social psychological priming studies expose participants to situational cues that are designed to make a construct more accessible, and then assess the effects of this exposure in subsequent, ostensibly unrelated tasks. For example, in the now classic Donald paradigm, participants perform a task that exposes them to a series of positive versus negative traits (e.g., “adventurous” vs. “reckless”). Next, in what is an ostensibly separate study, participants evaluate a target individual on the basis of ambiguous behaviors (e.g., “Donald was thinking, perhaps, he would do some skydiving”). The general finding is that people are more likely to disambiguate these behaviors in a positive direction when “primed” with relevant positive traits (i.e., “adventurous”), and more negative when primed with

relevant negative traits (i.e., "reckless"; e.g., Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1980). Similar paradigms are used in behavioral priming studies. For example, Bargh, Chen, and Burrows (1996) had participants complete a scrambled sentence task in which they attempted to create sentences from sets of words. Embedded within some of these sets were words that were either related to stereotypes about the elderly (e.g., "forgetful," "grey," "wrinkle") or stereotype-neutral (e.g., "thirsty," "clean," "private"). Those exposed to elderly stereotypes subsequently were observed to walk more slowly down a hallway than those exposed to stereotype-neutral content. This impact of enhanced accessibility of content is what is traditionally referred to as "priming effects."

PRIMING PROCESS RATHER THAN CONTENT

Anderson (1982, 1983) in his ACT* model of skill acquisition introduced the distinction between declarative and procedural knowledge. Whereas the activation of declarative knowledge made particular content more likely to be used to solve a given problem, the ACT* model also proposed that the activation of procedural knowledge could make particular cognitive operations more likely to be used. Thus, the ACT* model suggests that not only should one be able to prime content, but one should also be able to prime content-general cognitive procedures. Indeed, extensive research suggests that by having participants engage in a particular cognitive procedure in one task promotes the tendency for that same cognitive operation to be used in subsequently semantically unrelated tasks. For example, in one early example of such "procedural" or "mindset" priming, participants induced to use a heuristic versus algorithmic rule to solve a base-rate problem were more likely to use the same rule to solve subsequent problems that they encountered (Ginossar & Trope, 1987). In contrast to traditional priming which aims to make particular content more accessible, mindset priming attempts to activate a particular set of cognitive operations or procedures that may then carry over to subsequent unrelated tasks.

Procedural or mindset priming has been used to study a wide variety of psychological phenomena. One prominent example that has used such methodology is work examining the distinction between deliberative and implemental mindsets (e.g., Gollwitzer, 1990). Goal theorists posit that goal setting and goal striving are distinct phases of goal pursuit, with each activating distinct cognitive operations that help people address the challenges associated with each phase, namely, deliberative versus implemental mindsets, respectively (e.g., Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987). In empirical demonstrations of this hypothesis, participants identify and elaborate on a goal they are considering but have not yet acted upon (goal setting) versus a goal they have committed to and are planning to execute in the near future (goal striving; e.g., Gollwitzer & Kinney, 1989; Taylor & Gollwitzer, 1995). The impact of this manipulation is assessed using measures that are unrelated in content to the goals that participants generate. For example, in one study, those who deliberated whether to commit to a personal goal (relative to those who generated the means by which to implement a decided-upon goal) were more likely to attend to distractor stimuli on a goal-irrelevant reaction time task (Fujita, Gollwitzer, & Oettingen, 1997). Findings such as these suggest that the

deliberative mindset engages cognitive operations that render people more “open-minded” than the implemental mindset, and that these mindsets can carry over to tasks that are irrelevant to the context that initially induced them.

Mindset priming is also used to study regulatory focus theory, which proposes two distinct motivational orientations, namely, promotion versus prevention (e.g., Higgins, 1997, 1998). Promotion tunes people to concerns about nurturance and ideals, enhancing sensitivity to gains relative to non-gains. Prevention, by contrast, tunes people to concerns about security and obligations, enhancing sensitivity to losses relative to non-losses. To activate promotion (vs. prevention) as mindset, researchers ask participants to think about how their hopes and ideals (vs. duties and obligations) have changed over time (e.g., Higgins, Roney, Crowe, & Hymes, 1994). The impact of these manipulations is evident even on subsequent tasks that are irrelevant in content to the responses participants provide, such as people’s willingness to take risky gambles (e.g., Scholer, Zou, Fujita, Stroessner, & Higgins, 2010).

Other areas of research that have incorporated the notion of mindsets include social power (Galinsky, Gruenfeld, & Magee, 2003; Smith & Trope, 2006), impression formation (Smith, 1984; Smith & Branscombe, 1987),¹ and construal level theory (e.g., Freitas, Gollwitzer, & Trope, 2004; Fujita, Trope, Liberman, & Levin-Sagi, 2006). Research on the latter is particularly relevant for the present paper and will be reviewed in more detail in subsequent sections. We note that for the sake of clarity, when discussing the priming of cognitive procedures, we will specifically use the term “mindset priming” to distinguish it from traditional “priming.”

“THE BLOOMING, BUZZING CONFUSION”

Key to most priming studies is the lack of contingency awareness on the part of participants between the priming materials and the primary dependent behavior (e.g., Lombardi, Higgins, & Bargh, 1987). Once aware, participants may attempt to reduce the impact of the primed materials on their responses (e.g., Wegener & Petty, 1995). Another key is ambiguity. Accessibility is most likely to impact perception, judgment, decisions, and behavior when the accessible construct helps to disambiguate stimuli by “tipping” them in one direction or another (e.g., Bruner, 1957; Higgins, 1996). Given this, priming studies deliberately try to confuse participants, occluding the true purpose of various materials and procedures with little guidance on what constitutes an appropriate response. Borrowing a quote from James (1890), it is from this “blooming, buzzing confusion” that priming effects emerge.

1. We might note that these early procedural priming studies on impression formation suggest that what is primed in traditional priming effects is not specific content, as suggested by a number of priming researchers, but rather specific cognitive procedures (Smith, 1984; Smith & Branscombe, 1987). For reasons unclear to us, this alternative account of priming has been largely overlooked. We might observe that the account of priming that we present in this paper is agnostic as to whether traditional priming effects result from the activation of specific content versus procedures, and can incorporate both possibilities.

BEYOND ASSOCIATIONS: THE ROLE OF CONSTRUAL IN PRIMING EFFECTS

It is precisely because of the confusion and ambiguity that priming paradigms present that we argue it is critical to understand participants' subjective construal. To orient and organize a response, people must construct a mental representation of the circumstances in which they find themselves. They must interpret what it is that they are presented with ("what is it?") and determine what constitutes an appropriate response ("how do I want to respond"). Although early research recognized the need to understand such construal or interpretational processes (e.g., Higgins, 1996; Martin, 1986), it is surprising how little attention they have received in traditional accounts of priming effects.

Traditional theoretical accounts, particularly those concerned with behavioral priming effects, are grounded in passive associative models (e.g., Dijksterhuis & Bargh, 2001; Higgins, Bargh, & Lombardi, 1985; Srull & Wyer, 1980). Priming stimuli are believed to make accessible particular mental content, which then enhances the likelihood of a particular response. This is perhaps best captured in the ideomotor account of behavioral priming, which suggests that simply thinking of an act engages the same content and processes that are required to enact that act (James, 1890). Thus, making accessible cognitions relevant to an act may automatically activate the tendency to enact that behavior (e.g., Dijksterhuis & Bargh, 2001). Associative activation of mental constructs is also a component of the more recent active-self account (e.g., Wheeler et al., 2007, 2014, this issue), which suggests that one mechanism by which priming exerts its influence is by making more accessible a biased set of self-knowledge with judgmental and behavioral implications that are relevant to the focal task at hand. At the heart of many models of priming then is a focus on passive associative connections between prime and existing mental content.

By contrast, more recently proposed alternative models have instead adopted a constructionist perspective, emphasizing more active interpretation and meaning-making processes as key determinants of priming phenomena. For example, the motivated-preparation account suggests that people use the accessibility of primed concepts as input into a decision process that determines how best to respond to an environment given one's goals (e.g., Cesario et al., 2006; Cesario, Plaks, Hagiwara, Navarrete, & Higgins, 2010; Cesario & Jonas, 2014, this issue). Activated knowledge is interpreted in light of one's goals and one's environment to determine one's best response (see also the ROAR model proposed by Eitam & Higgins, 2010). When aggression is made accessible, for example, people may fight or flee depending on whether they believe they are capable of winning a fight, and whether the environment preferentially enables a fight or flight response (Cesario et al., 2010). The situated-inference model, another constructionist model, highlights one's attribution about the source of the accessibility of the primed concept as a key process in priming phenomena (Loersch & Payne, 2011, 2014, this issue). When the source of accessibility is attributed to internal factors such as one's goals and values, accessible knowledge then forms the basis of one's responses. By contrast, when the source of accessibility is attributed to external factors, such

as features of one's social environment, accessible knowledge is more likely to be dismissed and have no impact on one's responses. The active-self account also proposes interpretational processes as a potential mechanism, suggesting that when accessible knowledge is mistaken for self-knowledge, priming effects are more likely to occur (Wheeler et al., 2007, 2014, this issue). Construal or interpretational processes, moreover, play a central role in more recent computational models of priming effects ("affective meaning" mechanisms; Schröder & Thagard, 2013, 2014, this issue). Thus, in contrast to traditional passive associative accounts, researchers increasingly recognize active meaning-making as an integral component in priming phenomena.

HOW STRUCTURED VERSUS UNSTRUCTURED REGULATION IMPACT PRIMING

Our approach extends these constructionist models of priming. Like many constructionist accounts, we propose that the meaning of stimuli in light of people's goals is central to understanding responses to priming stimuli. Under some conditions, however, people may not immediately recognize what personal goals should be or may be pursued in a given context. In such circumstances, people may be more susceptible to external influence, using salient cues to ascertain what their goals in that context should be. We propose that there may be two distinct regulatory dynamics. When engaged in more structured regulation, people bring their goals to the task at hand and actively strive to maintain goal consistency in their representations and their behavioral decisions. People use their goals as scaffolds with which to build mental representations of the present in a selective manner. When engaged in more unstructured regulation, people are more sensitive to the immediate demands of the present. People build representations "on the fly," attending to salient cues in an open, flexible manner to determine what constitutes an appropriate response to the immediate circumstances. Both dynamics play important functions. The former ensures people remain committed to their goals, whereas the latter ensures people are attuned to their immediate environment. We propose that each of these dynamics may produce a priming effect, but may do so under very different circumstances.

Our constructionist approach is inspired by our own work on the influence of subjective construal on self-regulation. Our goals can impact what we "see" in social environments. Research suggests, for example, that we perceive desired objects as closer, and undesired objects farther, than they objectively are (e.g., Balcetis & Dunning, 2010). When observing ambiguous stimuli, we tend to perceive that stimuli in a goal-consistent manner, and ignore goal-inconsistent interpretations (e.g., Balcetis & Dunning, 2006; Balcetis, Dunning, & Granot, 2012). If a situational cue is consistent with the goals that participants bring to a given situation, then it is more likely to be integrated into their subjective construal of that context and impact responses. If a cue is irrelevant to one's goals, then it may be ignored and dismissed. If cues suggest threats to one's goals, they may be summarily dismissed, or be actively attended to and provoke information processing, judgment,

and behavior in the opposing direction suggested by the cue in an effort to protect those valued goals.²

Conversely, how people construe a given context may change what goals appear relevant, which then may impact behavior. Research suggests, for example, that providing extrinsic rewards can undermine motivation toward what was originally an intrinsically motivated task (Lepper, Greene, & Nisbett, 1973). The extrinsic rewards presumably changed people's construal of the task from one engaged in for fun to one that is engaged in to obtain the reward, which then in turn leads to decreases in motivation when rewards are no longer available. Similarly, whereas construing a flu shot as "immunization" may promote inoculation behavior, construing the same behavior as "injection" may inhibit inoculation behavior (Young & Fazio, 2013). Although both construals equally describe the act of getting a flu shot, they direct attention to features that reflect contrasting concerns (health vs. pain), and thus motivate very different behavior. In this way, salient situational cues that activate or "prime" one subjective construal over others can promote the pursuit of motivated behavior.

Our work in particular has focused on contexts which present situational cues that promote behavior that runs contrary to people's valued goals. A prototypical example of such a situation is a self-control dilemma in which the availability of some reward or outcome in one's immediate environment (e.g., a piece of cake) tempts people to engage in behaviors that endanger the attainment of more remote rewards or outcomes (e.g., weight loss; Ainslie, 1975; Fujita, 2011; Mischel, Shoda, & Rodriguez, 1989; Rachlin, 2000; Thaler & Shefrin, 1981). Whereas self-control failure entails advancing the attainment of the more immediate reward, self-control success entails advancing the attainment of the more remote reward. Self-control is particularly challenging because the immediate presence of the proximal rewards present numerous cues to indulge. In essence, people are "primed" by their environments to indulge in the proximal temptation. Sustaining motivation toward more remote yet valued rewards is difficult because of the lack of concrete cues in the here and now. Successful self-control requires ignoring salient cues to indulge in proximal temptation, and instead engage in processing that supports the attainment of more distal ends (e.g., Fujita, 2011; Mischel et al., 1989; Rachlin, 2000; Trope & Fishbach, 2005). That is, people must construe the context in a way that sustains and supports their long-term goals to be successful at self-control.

The parallels between priming and self-control research, respectively, are highlighted by numerous studies. For example, exposure to words related to palatable foods spontaneously activates positive hedonic thoughts among restrained eaters, distracting them from the focal task at hand (e.g., Papies, Stroebe, & Aarts, 2007). Similarly, smokers who have abstained from smoking report significantly more positive thoughts about smoking when exposed to a lit cigarette versus a roll of tape (e.g., Sayette & Hufford, 1997). Exposure to these situational cues can also im-

2. Schroeder & Thagard (2013) refer to the integration of inputs into a representation as "positive constraint satisfaction," and refer to the inhibition of inputs as "negative constraint satisfaction." Other computational neuroscientists have referred to these same processes as "foregrounding" and "backgrounding," respectively (Hazy, Frank, & O'Reilly, 2007; Zelazo & Cunningham, 2007). These models suggest that such processes can occur without requiring conscious intention or awareness.

pact behavior. Food cues, such as visual displays and smells, prompt restrained dieters to report greater hunger and cause them to eat greater quantities of indulgent foods (e.g., Federoff, Polivy, & Herman, 1997). This work collectively suggests that situational cues can make more accessible (and thus “prime”) thoughts, feelings, and behaviors that promote indulgence in proximal temptation to the detriment of long-term goals.

Much of the work mentioned above describes people’s more unstructured responses to goal-undermining temptations. Our work, along with others, by contrast, has focused on the structured regulatory mechanisms that people engage in to maintain goal-consistent construals in the face of goal-undermining cues (e.g., Fujita, 2011; Trope & Fishbach, 2005). Consider, for example, work by Fishbach, Friedman, and Kruglanski (2003). To defend against goal-undermining temptation, people may learn to associate temptation cues with goal-related cognition. This temptation-cued goal priming should promote goal success in the face of temptation by biasing information processing in favor of one’s goals. Most associations, however, are bidirectional, which may create self-regulatory problems. A bidirectional association between temptation and goal could undermine goal pursuit by allowing goal cues to prime temptation-related cognition. To address this latter possibility, Fishbach and colleagues (2003) suggest that people develop asymmetric temptation-goal associations, whereby exposure to temptation cues prime overriding goal concepts, but exposure to goal cues does not reciprocally prime temptation concepts. Indeed, empirical evidence supports the assertion that asymmetric associative links enhance goal-directed behavior in the face of salient temptation cues, biasing thoughts in favor of goals over temptations (Fishbach et al., 2003; see also Papiés, Stroebe, & Aarts, 2008). Likewise, people’s evaluative associations appear to be sensitive to their goals. When engaged in goal pursuit, people evince an enhanced readiness to associate positivity to goal-relevant objects (e.g., Ferguson & Bargh, 2004). These changes in evaluation appear not to require conscious intention or monitoring. Similarly, goal-undermining temptations are associated automatically with negativity (e.g., Fishbach & Shah, 2006; Fishbach, Zhang, & Trope, 2010). These cognitive and evaluative associations appear to help sustain goal-consistent construal of events, even in the face of salient cues that may suggest alternative courses of behavior.

Although people have available to them a number of regulatory mechanisms for sustaining goal-consistent construals, and thereby enhancing goal-directed behavior in the face of tempting alternatives, they do not always engage them (e.g., Fishbach et al., 2010; Fujita & Han, 2009; Fujita & Roberts, 2010; Fujita & Sasota, 2011; Myrseth & Fishbach, 2009). When people fail to engage these mechanisms, they are more vulnerable to the influence of salient local rewards. The goal of our research has been to understand when and why people evoke versus fail to evoke these mechanisms. This work has highlighted the central role that structured versus unstructured regulation plays in people’s responses to situational cues.

In essence, we are proposing that participants in a priming experiment context are posed with a self-regulatory challenge. Like those presented with self-control dilemmas, participants in priming experiments must understand what goals are relevant in a particular context, and construct representations around those goals by making implicit or explicit decisions about the goal relevance of various cues. Determining what relevance various cues have for their goals, however, can be a difficult, given that experimenters purposely occlude the purpose of the tasks at

hand with the hope that participants will decide, implicitly or explicitly, that priming stimuli are relevant and informative. Participants may or may not appreciate the relevance of the task at hand for the goals that they themselves bring to the experiment. From our perspective, key to understanding when priming is likely to be evident depends on whether the mental representation that people construct reflects their goals and what, if any, relationship those goals have to the salient cues in the immediate environment.

When engaged in structured regulation, the primary determination of what, if any, impact priming stimuli may have depends on goal relevance of the stimuli. People should be more responsive to goal-relevant stimuli and less responsive to goal-irrelevant stimuli. However, priming stimuli may also impact people through an alternative mechanism. When engaged in unstructured regulation, people may be more likely to use priming stimuli as cues to what their goals should be. As such, they may become more likely to act in a manner consistent with priming stimuli, even when such judgments, decisions, and behavior are inconsistent with valued goals. Thus, to understand priming phenomena, we propose that researchers need to appreciate the potential operation of two distinct dynamics by understanding what goals people are pursuing, whether people use these goals to frame their construals of the priming context, and what relevance the priming stimuli have to these goals.

LEVEL OF CONSTRUAL

Drawing from construal level theory (CLT; e.g., Trope & Liberman, 2003; 2010), our work focuses on level of construal as an important determinant of whether people engage in structured versus unstructured regulation (Fujita, 2008; Fujita & Carnevale, 2012; Fujita et al., 2014). Central to CLT is the notion of psychological distance—any removal of objects and events from direct experience. An event that is to occur next year, for example, is more psychologically distant than an event that occurs next week. When events are psychologically distant, we generally lack reliable information about their specifics. To be able to think about such events in the absence of detailed specifics, we engage in cognitive abstraction, or high-level construal—constructing mental representations that capture the core, essential, goal-relevant features that are likely to be apparent in any possible manifestations of the events. For example, a distant beach vacation may conjure thoughts about sitting on sandy shore with a drink in hand feeling the warmth of the sun. We may not know which beach, what drink, or how warm, but every beach vacation will have these elements. As events become more proximal and detailed specifics become more available and reliable, we use this information to create more idiosyncratic representations via a process of low-level construal. Functionally, low-level construal allows us to tailor our thoughts, feelings, and actions to the unique demands of the present context. We can thus represent the present beach vacation as enjoying *this* stretch of beach, drinking *this* mojito made at *that* drink stand. Whereas high-level construal allows us to transcend the particulars of the here and now to consider remote time, places, people, and possibilities, low-level construal immerses us into them (see also Ledgerwood, Trope, & Liberman, 2010).

An extensive literature supports the proposition that people construe psychologically distant (vs. near) events by engaging in high-level (vs. low-level) con-

strual. For example, when actions are to be performed next year versus tomorrow, people are more likely to identify those actions in terms of the general ends they can achieve than in terms of the specific means by which those actions are executed (Liberman & Trope, 1998). When asked to categorize objects associated with events to occur next year versus next week, people are more likely to sort these objects into fewer, broader categories, suggesting more abstract, superordinate categorization (Liberman, Sagristano, & Trope, 2002). Similar findings have been found when manipulating other dimensions of psychological distance, including spatial distance (e.g., Fujita, Henderson, Eng, Trope, & Liberman, 2006; Henderson, Fujita, Trope & Liberman, 2006), social distance (e.g., Liviatan, Trope, & Liberman, 2008; Smith & Trope, 2006), and hypotheticality (e.g., Todorov, Goren, & Trope, 2007; Wakslak, Trope, Liberman, & Alony, 2006). Thus, information about the psychological distance of an event can impact how people construe that event.

Research suggests that construal levels can also be primed as procedural mindsets in the absence of any information about psychological distance. For example, one commonly used manipulation presents participants with a behavior (“maintain good relationships”) and asks them to generate responses as to “why” versus “how” they perform that action (e.g., Freitas et al., 2004). Whereas questions about “why” prompt participants to consider the general ends achieved by the behavior, questions about “how” prompt them to consider the specific means by which to enact that behavior (e.g., Liberman & Trope, 1998; Vallacher & Wegner, 1987; 1989). Not only does this procedure promote high-level versus low-level construal of the target behavior, respectively, but it also impacts how participants construe ostensibly unrelated events (e.g., Freitas et al., 2004; Fujita, Trope, et al., 2006). Another commonly used manipulation is the categories vs. exemplar task (Fujita, Trope et al., 2006). In this task, participants are presented with a series of objects (“dog”) and asked to generate either superordinate category labels or subordinate exemplars (e.g., “animal” vs. “poodle”). This too promotes a tendency to construe ostensibly unrelated events in high-level versus low-level terms, such as identifying subsequent actions in terms of ends versus means (Fujita, Trope et al., 2006). Note that neither task is designed to activate any particular content, but rather is designed to prompt participants to rehearse the processes of abstraction and concretization that are at the heart of the distinction between high-level and low-level construal. The ability to prime construal level as a procedural mindset is a useful methodological tool with which to examine the impact of high-level versus low-level construal on various psychological phenomena, including self-regulation and goal pursuit.

STRUCTURED VERSUS UNSTRUCTURED REGULATION: THE ROLE OF CONSTRUAL LEVEL

CLT may be relevant to understanding the mechanisms that underlie traditional priming effects in that high-level and low-level construal differentially impact people’s sensitivity to their goals and values, and recognizing the goal and value relevance of objects and events. The expanded “forest beyond the trees” perspective of high-level construal should enhance appreciation of the broader implications of one’s behavior. This more expansive perspective should help heighten the

relevance of one's goals and values to specific behaviors in specific contexts and therefore promote structured regulation. By contrast, the more focused "leaves and branches" perspective of low-level construal should heighten sensitivity to the idiosyncratic demands of the here and now. This narrowed perspective allows one to tailor behavior to capitalize on unique opportunities in current context, but potentially at the cost of losing sight of the big picture. Low-level construal may therefore be associated with unstructured regulation. Following this reasoning, construal level may be an important determinant in whether people respond to stimuli (including priming cues) in a structured versus unstructured regulatory manner.

Supporting this assertion, research suggests that high-level relative to low-level construal makes people more sensitive to their goals and values. As noted earlier, inducing high-level construal by temporally distancing an event promotes identifying actions in terms of the broader goals and values expressed by the acts rather than in terms of the specific means by which to carry out those actions (Liberman & Trope, 1998; see also Fujita, Henderson et al., 2006; Liviatan et al., 2008; Smith & Trope, 2006; Wakslak et al., 2006). This coding of events in terms of ends versus means appears to influence to what degree people make decisions and act in accordance with their goals and values. Research indicates that people are more likely to behave concordantly with their goals and values when they are engaged in high-level rather than low-level construal (e.g., Eyal, Sagristano, Trope, Liberman & Chaiken, 2009; Torelli & Kaikati, 2009; Trope & Liberman, 2000). For example, when given an opportunity to volunteer to help refugees, those participants who endorsed universalism values were more likely to volunteer their time when induced to construe events in high-level, rather than low-level, construal (Torelli & Kaikati, 2009). Thus, high-level relative to low-level construal appears to highlight the goal or value relevance of objects and events, and thus promotes structured rather than unstructured regulation.

Our research on self-control also suggests that whereas high-level construal promotes structured regulation, low-level construal promotes unstructured regulation. When presented with salient alluring temptations, those engaged in high-level rather than low-level construal are more likely to exhibit self-control, making behavioral decisions that are consistent with distal goals (for reviews, see Fujita, 2008; Fujita & Carnevale, 2012). In one study, for example, those concerned about weight loss preferred to eat an apple over a candy bar when engaged in high-level rather than low-level construal (Fujita & Han, 2009). This suggests that despite their immediate salience, people who are engaged in high-level relative to low-level construal are more likely to recognize temptations as inconsistent with their goals. Those engaged in low-level construal, by contrast, appeared to be more sensitive to the behavioral implications of salient cues, engaging in behavior that was inconsistent with their goals. People's behavior thus appears to be characterized by structured rather than unstructured regulation when induced to engage in high-level rather than low-level construal.

Research has also indicated that high-level relative to low-level construal promotes cognitive processes that are consistent with structured versus unstructured regulation, respectively. Most psychological models of self-control emphasize deliberate and effortful inhibition of impulses that are activated (or in some sense "primed") by salient temptations (for a review and critique, see Fujita, 2011). By

contrast, our constructionist account suggests that self-control can be achieved by changing the construal or meaning of the temptation stimulus. A dieter may perceive a piece of chocolate cake as a “diet-buster” rather than a “tasty snack.” These two interpretations of the same chocolate cake have very different evaluative connotations, which in turn should promote very different behaviors. To the extent that high-level (vs. low-level) construal promotes more goal-consistent construals of events, it should lead people to construct representations of temptations that emphasize their negative rather than positive features. Indeed, research suggests that temptations are evaluated more negatively by those engaged in high-level rather than low-level construal (e.g., Fujita & Han, 2009; Fujita, Trope et al., 2006). These changes in evaluation are evident even when assessed with implicit attitude measures—assessments that do not require conscious deliberation by participants (Fujita & Han, 2009). This latter finding indicates that these changes in evaluation are not likely due to some effortful or deliberative corrective mechanism, but rather to a change in the subjective interpretation or construal of the temptation (for similar distinctions between construal and inhibition, see e.g., Fucito, Juliano, & Toll, 2010; Goldin, McRae, Ramel, & Gross, 2008). High-level relative to low-level construal promotes representations that direct people’s attention to the negative goal-relevant features of temptations, which in turn impacts behavioral decisions (Fujita & Han, 2009). Thus, in addition to behavior, high-level relative to low-level construal appears to impact people’s evaluative processing in a manner that reflects structured rather than unstructured regulation.

Changes to the associative connections between various constructs in the mind also suggest that high-level (vs. low-level) construal promotes structured (vs. unstructured) regulation. As noted earlier, research suggests that self-control benefits from an asymmetric pattern of associations between temptation and goal concepts, such that temptation cues prime goal cognition, but goal cues do not reciprocally prime temptation cognition (Fishbach et al., 2003; Papies et al., 2008). Supporting the idea that construal level impacts whether people’s self-regulation is characterized by structure, our work suggests that these functional asymmetric temptation-goal associations are evident only when people are engaged in high-level rather than low-level construal (Fujita & Sasota, 2011). It is important to note here that assessing temptation-goal associations fundamentally depends on priming methodology. That is, participants are first presented with a temptation or goal stimulus (i.e., the prime) and then with a target stimulus about which they must make a lexical decision (i.e., word vs. non-word). On critical trials, the target stimulus is either a goal or temptation stimulus. When primes and targets are cognitively associated, participants are faster to respond in making their lexical decisions (e.g., Neely, 1977). Our work suggests that whereas temptations and goals can reciprocally prime each other at low-level construal, these associative connections are much more selective and goal relevant at high-level construal: Temptations can prime goals, but goals do not prime temptations (Fujita & Sasota, 2011). This provides initial evidence that construal levels can impact whether and when priming effects are likely to appear. When induced to high-level construal, people’s cognitive and behavioral responses to priming stimuli reflect a structured regulatory dynamic that systematizes cognitive associations around valued long-term goals. By contrast when induced to low-level construal, people’s reactions appear less structured (and thus bi-directional), leading to behavior that is more confused and

open to the influence of contextual cues irrespective of goal relevance—an indication of unstructured regulatory dynamic.³

CONSTRUAL LEVELS AND TRADITIONAL PRIMING EFFECTS

Research on the effects of construal level on traditional priming effects on social judgment has revealed inconsistent results. Research by Förster, Liberman, and Kuschel (2008) suggests that high-level, not low-level, construal promotes the assimilation of primed content into social judgment. Thus, when primed with the concept of aggressiveness, perceivers engaged in high-level construal were more likely to judge an ambiguous target as more aggressive than those engaged in low-level construal. In contrast, research by Henderson and Wakslak (2010) suggests that it is low-level, not high-level, construal that promotes assimilation of primed content. They find that when presented with ambiguous behavior, those primed with “reckless” are more likely to evaluate the target negatively than those primed with “adventurous” when engaged in low-level rather than high-level construal. We suggest that this apparent discrepancy in findings reflects the operation of the two dynamics that we propose. High-level construal, by enhancing one’s recognition of the relevant goals, promotes priming effects when people perceive priming stimuli to be goal relevant. Low-level construal, by contrast, promotes priming effects via a different mechanism: taking cues from one’s environment to determine what one’s goals should be. Thus, Förster and colleagues (2008) may document priming effects via structured regulation, whereas Henderson and Wakslak (2010) may document priming effects via unstructured regulation.

Indeed, Henderson and Wakslak (2010) highlight important methodological differences that are consistent with this suggestion. Specifically, Förster and colleagues (2008) presented participants with priming stimuli after manipulating construal level, whereas Henderson and Wakslak (2010) presented priming stimuli before manipulating construal level. The ordering of the construal level and priming manipulations may have altered to what extent priming materials were seen as relevant to the goals of the subsequent judgment task. The greater temporal contiguity between priming manipulation and judgment task in the Förster and colleagues’ (2008) work may have led participants to code the primed stimuli as relevant to the goals of the judgment task. Those induced to high-level relative to low-level construal may have thus been more ready to incorporate these goal-relevant cues into their judgments. By contrast, the temporal discontinuity between priming stimuli and judgment task in Henderson and Wakslak’s (2010) work may have led participants to code the primed stimuli as irrelevant to the

3. Research in computational neuroscience suggests that changes in evaluative associations and asymmetric temptation-goal associations are examples of “gating” (e.g., Hazy, Frank & O’Reilly, 2007). Similar to our construal level argument, this work suggests that there are regions of the brain that represent abstract constructs such as goals, which exert a top-down influence on more basic neural and cognitive networks by biasing specific associations. We extend this work by suggesting situational variables may moderate the degree of top-down influence (see also Fujita et al., 2014; Zelazo & Cunningham, 2007).

goals of the judgment task. Whereas those engaged in high-level construal may have dismissed priming materials as goal irrelevant, those engaged in low-level construal may have been more open to using them as guides to how to respond in the judgment task. Although empirical support for these speculations is still wanting, our approach may help to resolve apparent inconsistencies in the literature.

CONSTRUAL LEVELS AND THE INFLUENCE OF SITUATIONAL CUES: EMBODIMENT AND FLUENCY

Studies examining the impact of construal level on embodiment also support our theoretical framework. Research suggests that people's sensorimotor experiences can exert a powerful contextual influence on people's evaluations and judgments. Research by Wells and Petty (1980), for example, demonstrates that the physical experience of nodding (vs. shaking) one's head enhances people's agreement with concurrently presented persuasive messages. Similarly, wearing a heavy backpack can make distances that must be traversed appear longer (Proffitt, Stefannuci, Banton, & Epstein, 2003). Conceptually, embodiment is similar to priming in that it represents an incidental and contextual variable that leads people to think, feel, and act in a cue-consistent manner (e.g., Belding, Brinol, & Petty, 2014; Williams, Huang, & Bargh, 2009). Our framework suggests that the structured regulatory dynamic promoted by high-level construal should lead people to dismiss such cues to the extent that they are perceived as secondary and goal irrelevant to the task at hand. The unstructured regulatory dynamic promoted by low-level construal, by contrast, might be expected to enhance sensitivity to such cues. Indeed, research by Maglio and Trope (2012) supports these predictions. Wearing a heavy backpack had less impact on people's estimations of distances when they were engaged in high-level rather than low-level construal. We might note, too, that our approach suggests that to the extent that sensorimotor experiences are perceived as central rather than incidental to the task at hand, high-level over low-level construal should enhance rather than reduce embodiment effects. No work has yet manipulated the goal relevance of embodied cues to test this hypothesis.

Additional support for our theoretical framework can be found in research on fluency. People use fluency—the subjective ease or difficulty of processing stimuli—as a source of information in evaluating stimuli. Research suggests, for example, that fluent information is judged to be more truthful, inspires greater confidence, and generally promotes more positive evaluations (for review, see Alter & Oppenheimer, 2009). Like embodiment, fluency may also be viewed as an incidental and contextual cue that influences thoughts, feelings, and behavior. Our theoretical framework suggests, then, that the structured regulatory dynamic promoted by high-level construal should lead people to be less sensitive to the effects of fluency as compared to the unstructured regulatory dynamic promoted by low-level construal. Indeed, research by Tsai and Thomas (2011) confirms that high-level construal mitigates the effects of fluency on judgment. Whether an advertisement was clear versus blurry had less impact on participants' evaluation of the product when engaged in high-level versus low-level construal. However, our approach also suggests that high-level relative to low-level construal may at times enhance

rather than reduce the effects of fluency, particularly when fluency is perceived as goal relevant to the judgment at hand. In a test of this hypothesis, Tsai and Thomas (2011) manipulated the goal relevance of their participants' fluency experience by having participants base their evaluations either on their subjective feelings (fluency as goal relevant) versus on the information presented by the advertisement (fluency as goal irrelevant). They found that high-level relative to low-level construal increased fluency effects when fluency was goal relevant, but reduced those effects when fluency was goal irrelevant. This work highlights the importance of understanding the distinction between structured versus unstructured regulatory dynamics, and various mechanisms by which incidental and contextual cues can impact judgment, decisions, and behavior.

SUMMARY AND CONCLUSIONS

Prominent non-replications of social psychological priming effects, particularly those related to behavior, highlight the need to understand better the "active ingredients" that produce these effects. Although a great deal of research has been done to understand the ingredients necessary to produce priming effects (i.e., the specific boundary conditions or moderators), we argue that we must also appreciate that there may be different "recipes." In this paper, we have proposed two regulatory dynamics (i.e., recipes) that may foster priming effects via different mechanisms. When engaged in structured regulation, people will be particularly sensitive to the goal relevance of salient stimuli, attending to and responding to goal-relevant stimuli, and ignoring or perhaps even acting in the opposing direction of goal-irrelevant or goal-undermining stimuli. When engaged in unstructured regulation, people may look to cues in their environment as suggestions for what goals to pursue, leading them to be more susceptible to priming effects in general. Although we have suggested construal level as one critical factor that determines which of these two dynamics is more likely, full empirical support for our speculations is still wanting.

Traditional models of priming have at times suggested priming as an example of psychological phenomena in which people are out of control and at the mercy of their environments (e.g., Bargh, 1999). By contrast, our model, like other constructionist models of priming (e.g., Cesario et al., 2006, 2010; Eitam & Higgins, 2010), suggests that priming results from very sophisticated self-regulation processes. Thus, whether people are affected by the priming stimuli presented by stimuli fundamentally depends on understanding the relationship between those materials, the goals the participants have, and the type of regulation dynamic in which those participants are engaged. Understanding priming as reflecting an agentic act of self-regulation, rather than of passive reaction, may provide deeper insight into when and why priming effects occur (or do not occur). We encourage and look forward to future research exploring these possibilities.

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