

THE EFFECTS OF CONSTRUAL LEVELS ON ASYMMETRIC TEMPTATION-GOAL COGNITIVE ASSOCIATIONS

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Self-control benefits from an asymmetric pattern of cognitive associations whereby temptations facilitate the activation of goals, but goals interfere with the activation of temptations (Fishbach, Friedman, & Kruglanski, 2003). The present research examines how these cognitive associations are dependent on people's subjective construals of events. Drawing from past work demonstrating that abstract, goal-relevant (higher level) rather than concrete, goal-incidental (lower level) construals promote self-control (Fujita, Trope et al., 2006), three experiments tested the hypothesis that higher level construals promote asymmetric temptation-goal associations. Results confirmed that asymmetric temptation-goal associations are construal-dependent: higher level construals enhanced the tendency for temptations to facilitate activation of goals (Studies 1 and 2), and for goals to interfere with the activation of temptation (Study 3).

People frequently make decisions and behave in ways that undermine their goals and values. For example, smokers continue to smoke despite knowledge of the negative health consequences. Consumers spend more money than they have. Di-

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eters indulge in high-calorie foods in spite of their weight-loss aspirations. When presented with salient local rewards, people often choose to act in ways that are contrary to their global goals. These self-control failures represent some of the most perplexing and costly issues people face. Accordingly, understanding when and why people fail in their self-control efforts has become the focus of an intense multi-disciplinary research effort (e.g., Ainslie, 1975; Baumeister & Heatherton, 1996; Loewenstein, 1996; Metcalfe & Mischel, 1999; Rachlin, 2000; Thaler & Shefrin, 1981). In this paper, we build on recent findings emerging from the social-cognitive perspective that suggest certain cognitive processes promote vs. undermine self-control efforts (e.g., Fishbach et al., 2003; Papies, Stroebe, & Aarts, 2007, 2008; Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008; Wiers & Stacy, 2006). Specifically, we examine the impact that subjective mental construals of events can have on asymmetric temptation-goal cognitive associations.

SOCIAL-COGNITIVE APPROACH TO SELF-CONTROL

Social-cognitive researchers have attempted to isolate the cognitive signatures that predict self-control success or failure. Understanding or improving people's self-control from this perspective entails promoting functional cognitions and reducing dysfunctional cognitions. Much of this research thus far has adopted an individual differences approach. That is, researchers compare the information processing of those who are successful vs. unsuccessful in self-control to illuminate those processes that reliably distinguish the two groups. Studies have demonstrated, for example, that those unsuccessful at self-control more readily associate temptations with positive vs. negative concepts. That is, using reaction time measures such as the Implicit Association Test (IAT; e.g., Greenwald, McGhee, & Schwartz, 1998; see also Fazio & Olson, 2003), researchers have shown that smokers (e.g., Sherman, Rose, Koch, Presson, & Chassin, 2003), heavy alcohol drinkers (e.g., Houben & Wiers, 2007; 2008), and chronic dieters (e.g., Papies et al., 2007) find it easier to classify or identify temptations when they are paired with positive rather than negative stimuli. This pattern of reaction times suggests that when those unsuccessful at self-control encounter temptations in their environments, they are more likely to think positively, rather than negatively, of those temptations. In turn, these positive associations promote consumption of the temptations, leading to self-control failures (e.g., Hofmann, Rauch, & Gawronski, 2007; Houben & Wiers, 2007). Thus, research suggests that people's cognitive associations can bias information processing in a manner that promotes self-control failures.

Other research, however, has suggested that when people highly value their goals, they develop cognitive processes that counteract temptations. Fishbach and colleagues (2003) have argued that successful self-control requires thinking about one's overriding goals when confronted with a temptation. For example, dieters are more likely to avoid chocolate cake to the extent that cake prompts thoughts of being slim. Those highly motivated by dieting goals are more likely to practice in this association. Over time, this counter-active self-control response should habituate and become automatic, no longer requiring conscious intent. Empirical results have supported their argument. Using sequential priming-based methodology (e.g., Bargh & Chartrand, 2000; Fazio, 1990; Neely, 1977), Fishbach and colleagues (2003, Study 4) demonstrated that the more committed to dieting goals

participants were, the faster they were able to identify goal stimuli (e.g., slim) as words vs. non-words when preceded by temptations (e.g., cake) vs. control stimuli (e.g., sex). Demonstrating the efficacy of these associations for self-control, Fishbach et al. (2003, Studies 3 & 4) also demonstrated that those with the faster reaction times also self-reported greater self-control success in the domain of dieting (see also Papies et al., 2008; Stroebe et al., 2008). Behaviorally, moreover, subtle cues related to temptations in people's environment (e.g., an issue of *Chocolatier* magazine) paradoxically promoted decisions to choose an apple over a candy bar as a snack (Fishbach et al., 2003, Study 5). These findings suggest that with sufficient motivation, people can and will develop cognitive processes that automatically counteract processes that would otherwise undermine self-control.

Fishbach and colleagues (2003) also note that although most cognitive associations between concepts are bi-directional, a reciprocal pattern of associations between temptations and goals would be detrimental to self-control. That is, although the activation of goals by temptations enhances self-control, the activation of temptations by goals should be detrimental as it would re-activate those very thoughts that undermine and disrupt one's goal-striving efforts (see also Gollwitzer, 1990; McCulloch, Aarts, Fujita, & Bargh, 2008; Shah, Friedman, & Kruglanski, 2002). Accordingly, Fishbach and colleagues (2003) propose that to promote self-control, temptation-goal associations should be asymmetrical. People highly motivated to attain their goals develop cognitive associations whereby the activation of temptations facilitates the activation of goals, but the activation of goals interferes with the activation of temptations.¹ Empirical findings support these assertions. Among participants who are highly committed to dieting, temptations (cake) promoted the activation of goals (e.g., slim), but goals interfered with the activation of temptations (Fishbach et al., 2003). Such asymmetries in temptation-goal cognitive associations also appear to promote self-control success: those with greater asymmetries report greater success in goal domains (Fishbach et al., 2003, Studies 3 & 4).

SUBJECTIVE CONSTRUALS AND ASYMMETRIC TEMPTATION-GOAL ASSOCIATIONS

Despite developing cognitive processes such as asymmetric temptation-goal associations to counter temptation-elicited impulses, even the most highly committed individuals occasionally lapse at self-control. One potential explanation for this occurrence is that situational factors influence whether these temptation-counteracting

1. Fishbach et al. (2003) argue that goals inhibit the activation of temptations. Inhibition generally refers to the reduction of activation of a particular concept. However, all of the empirical evidence that support the inhibition of temptations by goals has been obtained using sequential priming methodology (see also Papies et al., 2008; Stroebe et al., 2008). The ability to infer inhibition of concepts from sequential priming methods has been called into question by a number of scholars (e.g., Anderson & Spellman, 1995; Levy & Anderson, 2002; McCulloch et al., 2008). Specifically, rather than reflect true inhibition of targets, slower reaction times for a particular prime-target pairing may result from weakened prime-target associations (i.e., associations that can more easily be interfered with and disrupted). The target may remain active and accessible, but its connection to the prime may be relatively weakened, thus slowing reaction times. In this paper, we adopt a more conservative interpretation of these findings (as well as our own) by interpreting slower reaction times as reflecting greater interference in prime-target associations rather than true inhibition of targets.

cognitive processes are utilized. Even if people have developed and have available these cognitive processes, if they are not activated or initiated, they cannot assist in goal-striving efforts. Rather than being rigidly activated in response to environmental cues, we suggest that temptation-goal associations are conditionally automatic (e.g., Bargh, 1989, 1994). We posit that to initiate these processes, people may require a particular mindset or frame of mind. Specifically, we propose that people's subjective construals of events are an important determinant in how people process information about self-control conflicts.

One of the central tenets of social psychology is that people do not process and represent their social worlds veridically and objectively; instead, they actively construct and interpret their social environments. Research has demonstrated that these subjective representations or *construals* of situations are critical factors in judgment and decision-making (e.g., Bruner, 1957; Griffin & Ross, 1991; Hastorf & Cantril, 1954; Mischel & Shoda, 1995; Nisbett, Caputo, Legant, & Marcek, 1973). Drawing from this literature, and from construal level theory specifically (CLT; Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2003; Trope, Liberman, & Wakslak, 2007), we suggest that the level of abstraction at which people process self-control conflicts systematically impacts whether adaptive processes, such as asymmetric temptation-goal associations, are activated and utilized in self-control conflicts.

CONSTRUAL LEVELS

Objects and situations involving self-control can be construed in multiple ways. For example, the same chocolate cake can be thought of as a tasty birthday treat or sinful diet-buster. These construals have different evaluative connotations, which in turn should impact self-control choice. Whereas construing cake as a tasty birthday treat has positive connotations and should promote the decision to eat it, construing the same cake as a sinful diet-buster has negative connotations and should promote the decision not to eat it. The notion that people's subjective construals can impact self-control forms the core of the present theoretical approach.

CLT proposes that people can construe the same event at different levels of abstraction (e.g., Liberman et al., 2007; Trope & Liberman, 2003, Trope et al., 2007). Higher level construals are more abstract mental representations that focus on the core, essential features of events. They are highly structured and coherent representations that exclude irrelevant details while extracting gist information. Lower level construals, in contrast, are more concrete representations that highlight the secondary, contextual specifics that make events singular and unique. Although these lower level construals help to differentiate one event from others, they lack the structure of higher level construals and emphasize peripheral and irrelevant details.

An extensive literature has supported the distinction between higher and lower level construals (for reviews, see Liberman et al., 2007; Trope & Liberman, 2003; 2010; Trope et al., 2007). For example, research suggests that increasing temporal distance systematically causes people to shift from lower level construals to higher level construals (Liberman, Sagristano, & Trope, 2002). Research also suggests, however, that people can construe events at different levels even in the absence of any differences in distance. In addition to chronic individual differences (e.g.,

Freitas, Salovey, & Liberman, 2001; Vallacher & Wegner, 1989), construal levels can be primed—inducing people to construe an event abstractly vs. concretely tends to influence how they construe subsequent unrelated events (e.g., Förster, Friedman, & Liberman, 2004; Freitas, Gollwitzer, & Trope, 2004; Fujita, Trope, Liberman, & Levin-Sagi, 2006). Importantly, research has demonstrated that these differences in construal levels systematically impact perception, judgment, decision-making, and behavior, in diverse domains such as prediction, person perception, self-regulation, persuasion, and negotiation (for reviews, see Liberman et al., 2007; Trope & Liberman, 2003, 2010; Trope et al., 2007).

CONSTRUAL LEVELS AND SELF-CONTROL

Self-control conflicts occur when salient local rewards contrast with people's more global goals. People fail at self-control when they choose concrete and locally available rewards at the expense of their more abstract and global goals. A construal level approach to self-control suggests that people prefer these local rewards to their global goals because they have construed situations in low-level terms. Higher level construals, in contrast, structure information processing around one's global goals and values in judgment and decision, and thus enhance self-control (Fujita & Han, 2009; Fujita, Trope et al., 2006).

To illustrate how construal levels impact self-control, consider a dieter choosing between an apple or candy bar as a snack. Lower level construals would lead the dieter to focus on concrete features of the choice event such as differences in taste, which would lead the candy bar to be the superior option. Higher levels of construals, by contrast, would lead the dieter to consider the more abstract implications of each food option. As dieters presumably value health over hedonism (the abstract implications of the two food options, respectively), they should prefer apples to candy bars when construing at higher levels. The discrepancy between the behavioral connotations of the higher and lower level construals cause the self-control conflict, which is then resolved by the construal adopted. Note that these predictions are specific to those for whom the choices reflect a self-control conflict (i.e., dieters). For the nondieter who does not value health over hedonism, higher and lower level construals of the event have the same behavioral connotations. Both the secondary features (i.e., taste) and abstract implications (i.e., the lack of concern about sacrificing health for hedonism) of the choice suggest eating the candy bar. There is no self-control conflict, and changing construal levels for such individuals should not necessitate any preference reversals.

Supporting this construal level approach to self-control are experiments in which people's level of construal was manipulated to produce changes in self-control. Priming construal levels by having participants generate superordinate ends vs. subordinate means of an unrelated action (Freitas et al., 2004), for example, reduced preferences for immediate over delayed outcomes and enhanced physical endurance (Fujita, Trope et al., 2006, Studies 1 & 2). Manipulating the tendency to construe situations in higher vs. lower level terms by having participants first generate superordinate category labels vs. subordinate exemplars, respectively, for a series of commonplace objects in an unrelated task also led to stronger behavioral intentions to engage in self-control actions and less positive evaluations of temptations (Fujita, Trope et al., 2006, Studies 3 & 4). Thus changing people's subjective

construals of events systematically impacts self-control (see also, Moore, Mischel, & Zeiss, 1976; Metcalfe & Baker, 1975).

PRESENT RESEARCH

As illustrated above, higher level versus lower level construals are more likely to frame events in terms of one's more global goals, and to guide decision-making and behavior to be consistent with those goals. To the extent that people value goal attainment in a given domain, higher level construals should thus be more likely to engage those cognitive processes beneficial to goal attainment. Preliminary evidence for this assertion comes from research examining the effect of construal levels on the ease with which people associate temptations with negativity (Fujita & Han, 2009). Female participants, who presumably highly value dieting (e.g., Ferguson, 2007; Mintz & Betz, 1988), were recruited and were induced to higher vs. lower level construals. They then completed the Apples vs. Candy Bars version of the Implicit Association Test (IAT; Karpinski & Hilton, 2001). The Apples vs. Candy Bars IAT measures the strength of association between apples/candy bars and positivity/negativity (e.g., good/bad; Greenwald et al., 1998). Results indicated that female participants induced to higher level construals found it easier to associate candy bars with negativity. Moreover, these construal-moderated evaluative associations mediated self-control choice. Participants' preference for apples at the end of the experiment was associated with greater association of candy bars with negativity. These findings suggest that higher level construals promote cognitive processes that make it easier to evaluate temptations more negatively, and that these more negative evaluative associations promote self-control behavior.

The present studies build on these findings by focusing not on evaluative associations, but rather on asymmetric temptation-goal associations. As indicated earlier, research has shown that self-control benefits from an asymmetric pattern of associations in which the activation of temptations facilitates the activation of goals, whereas the activation goals interfere with the activation of temptations (Fishbach et al., 2003). As higher level construals are more likely than lower level construals to frame and structure decision-making around one's abstract and global goals, they should also be more likely to promote asymmetric temptation-goal associations—to the extent that people value the goal domain in which these asymmetric associations are assessed.

We tested this hypothesis in three studies, using dieting as a focal goal of interest. Whereas Studies 1 and 2 examine how temptations facilitate the activation of goals as function of construal level, Study 3 examines how goals interfere with the activation of temptations as a function of construal level. Consistent with previous research (Fishbach et al., 2003; Papies et al., 2008), we predicted that increasing valuation of and commitment to dieting would be associated with greater facilitation of the activation of goals by temptations (Studies 1 and 2) and greater interference of the activation of temptations by goals (Study 3). Importantly, we predicted that these asymmetric temptation-goal associations as a function of goal value would be evident specifically among those construing events at higher level rather than lower level construals.

STUDY 1

OVERVIEW

Participants were first induced to construe events in higher vs. lower level terms with a procedure validated in previous research (Fujita, Trope et al., 2006). The degree to which temptations facilitated the activation of goals was then assessed using a lexical decision-based sequential priming procedure modeled after Fishbach et al. (2003). Using dieting as the focal self-control conflict, we measured the activation of dieting-related words by temptation vs. nontemptation words. Participants also reported to what extent they valued dieting, as previous research indicates that only those who value the focal goal show evidence of temptations activating goals (e.g., Fishbach et al., 2003; Papies et al., 2008). We predicted that temptations would facilitate the activation of goals with increasing valuation of dieting goals, but only when people construed events at higher level construals.

METHOD

Participants

Participants were 126 Ohio State University undergraduate students (79 women), who completed the study in exchange for course credit. Participants were randomly assigned to condition and were tested in groups of 1 to 4.

Materials and Procedure

Construal-Level Manipulation. Participants first completed an induction of construal level. They were presented with 40 objects, such as *actor*, *king*, *college*, and *movie*. Those in the high-level condition were asked to generate superordinate category labels for each, whereas those in the low-level condition were asked to generate subordinate exemplars. For example, given the item *college*, those in the high-level condition were asked, "College is an example of what?" (e.g., educational institution), whereas those in the low-level condition were asked, "An example of college is what?" (e.g., Ohio State University). This procedure has been shown to induce a tendency to construe subsequent unrelated events at higher vs. lower level construals reliably (Fujita, Trope et al., 2006).

Lexical Decision Task. After the construal-level manipulation, participants completed a computerized lexical decision-based sequential priming task modeled after Fishbach et al. (2003) that was designed to measure the activation of goals by temptations. Participants were presented with a series of letter strings and were asked to determine as quickly as possible whether each was a word or non-word. Each trial consisted of a centrally presented 1000 ms fixation point (+), a 300 ms prime word followed by a 50ms blank screen (stimulus onset asynchrony = 350 ms), and then a target letter string (which remained until participants responded). Judgments that occur following a stimulus onset asynchrony of 350 ms or less are interpreted as reflecting the strength of automatic association between primes and

targets (e.g., Bargh & Chartrand, 2000; Fazio, 1990; Neely, 1977). Participants indicated whether the target letter string was a word or non-word using the *right-ctrl* and *left-ctrl* keys, respectively. Each response was followed by a 1-sec delay. A total of 80 trials were presented, half of which represented word trials (40 trials). Of these latter trials, 20 trials presented target words that were dieting-related foods (e.g., broccoli, carrot, tofu). In 10 of these critical trials, dieting-related words were preceded by temptations that undermine dieting goals (e.g., fries, beer, nachos). The other 10 trials represented comparison trials in which dieting-related words were preceded by neutral primes (e.g., horse, door, square). The computer program randomly selected the specific prime-target pairings. The remaining 20 word trials consisted of neutral targets primed by neutral words.

The goal and temptation stimuli were selected and pre-tested using the same subject population. Sixty-nine Ohio State University undergraduates (43 women) participated in the pre-testing of stimuli for partial course credit. Run in groups of 10-15, participants were asked how much they associated a given word with undermining vs. promoting dieting goals. Specifically, participants were given a word (e.g., bacon) and asked how much they associated the word with undermining the goal to diet (1 = not at all, 6 = extremely) and how much they associated the word with promoting the goal to diet (1 = not at all, 6 = extremely) using a 6-point Likert scale. For each word, a difference score was calculated by subtracting the average "promoting" score from the average undermining score. The twenty food words with the most positive and negative difference scores were chosen as the dieting-related and temptation words, respectively (see Appendix). Statistical analyses confirmed that the average undermining score of the temptation words ($M = 2.43$, $SD = 1.44$) was indeed greater than that of the goal-related words ($M = -2.87$, $SD = 1.44$), $t(26) = 10.45$, $p < .001$.

Measurement of Goal Value. Following the lexical decision task, participants were asked to respond to four self-report items to measure dieting value, modeled after previous research (e.g., Fishbach et al., 2003; Papies et al., 2008). The four items were: "To what extent do you avoid high-fat, high-calorie foods," "How concerned are you about eating healthy foods," "To what extent do you make an effort to eat low-fat, low-calorie foods," and "How guilty would you feel if you consistently ate high-fat, high-calorie foods?" Participants responded using a 7-point Likert scale (1 = *not at all*, 7 = *extremely*). The four items were averaged to obtain an index of goal value ($\alpha = .84$; $M = 4.29$, $SD = 1.40$). Participants then provided demographic information (e.g., gender, age, year in school). Upon completion, a funneled debriefing was administered (e.g., Bargh & Chartrand, 2000). No participants reported being suspicious of the relationship between the construal-level manipulation and lexical decision task. Afterward, they were carefully debriefed and dismissed.

RESULTS AND DISCUSSION

Standard procedures were followed to prepare reaction time data for analysis (e.g., Bargh & Chartrand, 2000; Fazio, 1990). Given the difficulty of interpreting response times associated with errors, only those associated with correct responses were used in analyses. The average error rate for participants was 9.0%. To control for

TABLE 1. Estimated Mean Reaction Times (in ms) for Studies 1–3

	Goal Value			
	Low		High	
	Control	Experimental	Control	Experimental
Study 1				
Low-Level	665.44	635.24	655.10	645.69
High-Level	699.79	683.30	671.63	608.92
Study 2				
Low-Level	606.39	611.45	562.73	593.15
High-Level	603.58	612.78	585.01	569.74
Study 3				
Low-Level	586.06	578.42	561.84	548.83
High-Level	605.34	584.21	547.25	565.60

Note. High and low goal values reflect one *SD* above and below the mean. In Studies 1 and 2, experimental trials represent goal stimuli primed by temptation stimuli, whereas control trials represent goal stimuli primed by neutral stimuli. In Study 3, experimental trials represent temptation stimuli primed by goal stimuli, whereas control trials represent temptation stimuli primed by neutral stimuli.

excessive positive skew, response latencies were trimmed within ± 2.5 *SD* of each participants' cell means. Facilitation scores were then calculated by subtracting the average response latencies in the critical trials (goal words primed by temptations) from the average response latencies in the comparison trials (goal words primed by neutral words). More positive facilitation scores indicate greater activation of goals by temptations. We report estimated mean reaction times in Table 1.

Facilitation scores were regressed onto construal level (effects-coded: low-level = -1 and high-level = 1) and goal value (mean-centered).² Although there was no significant effect of construal level or goal value, the interaction between the two was statistically significant as predicted, $\beta = .19$, $t(122) = 2.09$, $p = .04$ (see Figure 1). As expected, increasing goal value was associated with enhanced activation of goals by temptations among those induced to high-level construals, $\beta = .28$, $t(61) = 2.29$, $p = .03$, but not low-level construals, $\beta = -.08$, $t(61) = .64$, $p = .52$. Thus, only those construing events in higher level terms replicated findings of previous research (Fishbach et al., 2003; Papies et al., 2008). Focusing specifically on those who valued dieting (i.e., those 1 *SD* above the goal value mean), only those construing events in higher level terms showed enhanced activation of goals by temptations, $\beta = .26$, $t(122) = 2.09$, $p = .04$. In contrast, there was no evidence of construal-moderated activation of goals by temptations among those who did not value dieting (i.e., those 1 *SD* below the goal value mean), $\beta = -.12$, $t(122) = 0.92$, $p = .36$. This pattern of data provides initial evidence that construal levels impact the degree to which the activation of temptations facilitates the activation of goals. Those who

2. Consistent with previous research (Fujita, Trope et al., 2006), the effect of construal level on self-reported goal value was not statistically significant (F 's < 1) in any of the present studies with the exception of Study 2. In that one study, higher level construals led to lower self-reported value for dieting, $\beta = -.16$, $t(161) = 2.05$, $p = .04$. Note, however, that simultaneous regression statistically controls for any covariance between predictor variables.

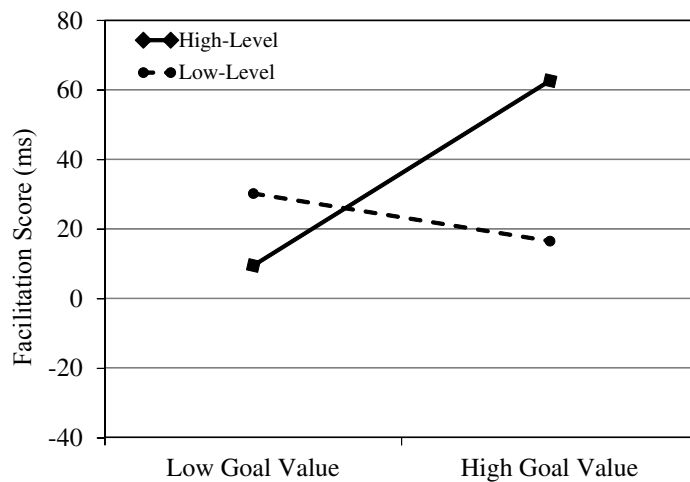


FIGURE 1. Facilitation scores as predicted by construal level and goal value, graphed ± 1 SD of the mean (Study 1). Higher facilitation scores reflect greater activation of goals when primed by temptation vs. neutral stimuli. Higher level construals promoted activation of goals by temptations, but only when goal value was high.

highly valued dieting demonstrated enhanced activation of goals by temptations only when they were construing events at higher level construals.

Although our interpretation of Study 1 is that higher level construals facilitated the activation of goals by temptations, given the materials that we used in the lexical decision task, a plausible alternative interpretation is that higher level construals merely increased the salience of the superordinate category food. That is, when those who valued dieting were induced to think more abstractly, foods (e.g., fries) increased the accessibility of other foods (e.g., broccoli). To address this alternative interpretation, rather than using goal-relevant objects as proxies for dieting goals (e.g., broccoli, carrot, tofu), Studies 2 and 3 used stimuli that more directly represent dieting goals themselves (e.g., diet, slim, slender). Although past research has used goal objects as goal stimuli (Fishbach et al., 2003, Studies 2 & 3), presenting participants with stimuli that more closely represent the goals themselves would allow for stronger conclusions about construal levels moderating the facilitation of goal activation by temptations.

STUDY 2

OVERVIEW

To manipulate construal levels, Study 2 employed a procedure developed by Freitas and colleagues (2004), in which participants generate superordinate ends vs. subordinate means of unrelated actions to induce a tendency to construe subsequent events at higher vs. lower level construals, respectively. Participants then completed a sequential priming task modeled after Study 1, which presented target stimuli that more closely represented the goal itself (e.g., *diet*, *slim*, *slender*) rath-

er than using diet-related food objects. As in Study 1, participants also reported to what extent they valued dieting. We predicted that among those who valued dieting, only those induced to higher level construals would show enhanced activation of diet goals by temptations.

METHOD

Participants

Participants were 162 Ohio State University undergraduate students (77 women), who completed the study in exchange for course credit. Participants were randomly assigned to condition and tested in groups of 1 to 4.

Materials and Procedure

Construal-Level Manipulation. Participants first completed an induction of construal level modeled after Freitas et al. (2004). They were asked to consider two focal actions (i.e., improve and maintain grades and dress well). For each action, participants generated superordinate ends achieved by the action vs. subordinate means by which the action is implemented. For example, those in the high-level condition were asked why they improve and maintain good grades. Having provided a response (e.g., Do well in school), participants were then prompted to ask why they engaged in their response (i.e., "Why do well in school?"). Participants were asked to provide four responses in this way, with each why question prompting an increasingly abstract response. They were then asked to repeat the exercise for a second action, dress well. Those in the low-level condition, in contrast, were asked how they improve and maintain good grades. Having provided a response (e.g., "Study"), participants were then prompted to ask how they engaged in their response (i.e., How do you study?). Participants were asked to provide four responses in this way, with each how question prompting an increasingly concrete response. They then completed the same exercise with a second action, dress well. Research indicates that these procedures reliably induce higher vs. lower level construals of subsequent unrelated events (Freitas et al., 2004; Fujita, Trope et al., 2006).

Lexical Decision Task. As in Study 1, participants then completed a computerized lexical decision-based sequential priming task to measure the degree to which the activation of temptations facilitated the activation of goals (Fishbach et al., 2003). Participants completed a total of 56 trials, half of which represented word trials (28 trials). Of these latter trials, 14 trials represented goal trials: 7 were critical trials (goal targets were primed with temptations) and 7 were comparison trials, (goal targets were primed by neutral stimuli). The specific prime-target pairings in the critical trials were: cake-diet, chips-slim, sugar-thin, cream-fit, dessert-skinny, cookies-slender, beer-lean. The specific prime-target pairings in the comparison trials were: knee-diet, down-slim, sky-thin, tie-fit, revised-skinny, troubled-slender, roll-lean. The temptation and neutral primes did not differ significantly in either length or frequency (Kucera & Francis, 1967): $t(12) = 1.13, p = .28$, and $t(12) = .65, p = .53$, respectively. The remaining 14 word trials were neutral trials and consisted of identifying neutral target words as words or non-words after being

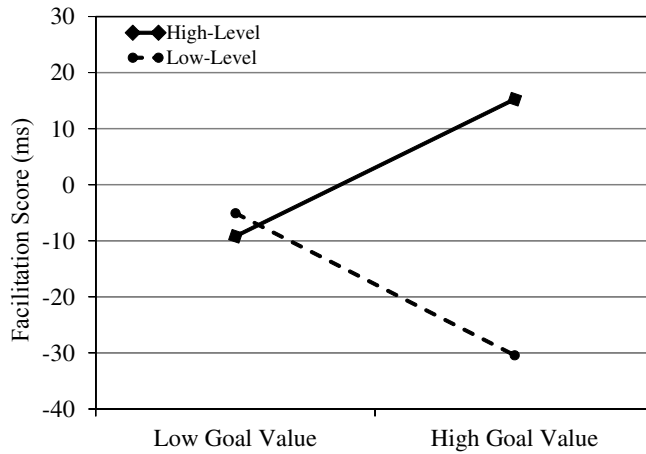


FIGURE 2. Facilitation scores as predicted by construal level and goal value, graphed ± 1 SD of the mean (Study 2). Higher facilitation scores reflect greater activation of goals when primed by temptation vs. neutral stimuli. Higher level construals promoted activation of goals by temptations, but only when goal value was high.

exposed to neutral word primes. The task was identical to the one used in Study 1 in all other respects.

Measurement of Goal Value. Upon completion of the lexical decision task, participants were asked to report how much they valued each of the goal stimuli words as goals. That is, participants indicated to what extent dieting, being slim, being thin, being fit, being skinny, being slender and being lean were important goals. Participants responded using a 7-point Likert scale (1 = not at all, 7 = extremely). The seven items were averaged to obtain an index of goal value ($\alpha = .88$, $M = 4.52$, $SD = 1.12$). Participants then provided demographic information (e.g., gender, age, year in school). Upon completion, a funneled debriefing was administered. No participants reported being suspicious of the relationship between the construal-level manipulation and lexical decision task. Afterward, they were carefully debriefed and dismissed.

RESULTS AND DISCUSSION

Response time data was prepared for analysis using procedures described in Study 1. The average error rate was 6.0%. We report estimated mean reaction times in Table 1.

Facilitation scores were regressed on construal level (effects coded: low-level = -1, high-level = 1) and goal value (mean-centered). Although there was no significant effect of construal level or goal value, the interaction between the two was statistically significant as predicted, $\beta = .16$, $t(158) = 2.07$, $p = .04$ (see Figure 2). As expected, although only marginally significant, those induced to higher level, $\beta = .18$, $t(84) = 1.67$, $p = .10$, not lower level construals, $\beta = -.15$, $t(74) = 1.31$, $p = .19$,

evidenced enhanced activation of goals by temptations with increasing goal value. Thus, as in Study 1, only those in Study 2 construing events in higher level terms replicated findings reported in previous research (Fishbach et al., 2003; Papies et al., 2008). Specifically focusing on those who valued dieting (i.e., those 1 *SD* above the goal value mean), higher level construals enhanced the activation of goals by temptations, $\beta = .30$, $t(158) = 2.71$, $p = .008$. In contrast, among those who did not value dieting (i.e., those 1 *SD* below the goal value mean), there were no significant differences in the activation of goals by temptations as a function of construal levels, $\beta = -.03$, $t(158) = .24$, $p = .81$.

The results from Study 2 provide additional evidence that construal levels moderate the tendency for temptations to facilitate the activation of goals. As in Study 1, Study 2 showed that higher level construals, using a different construal level manipulation and different set of goal stimuli, enhanced the activation of goals by temptations only among those who highly valued dieting. These two studies suggest that the facilitation of goals by temptations requires higher level construals of events. Note too that Study 2 helps address a potential re-interpretation of the findings from Study 1. As described earlier, one potential re-interpretation of Study 1 is that higher level construals increased the tendency for people to categorize both temptations and goal stimuli as foods (e.g., fries vs. broccoli), thus reducing reaction times. As food temptations are anti-thetical to dieting, the ability to re-interpret Study 2 findings by referring to superordinate categorization is less tenable.

Still, our argument that higher level construals enhance cognitive processes that lead to self-control would be bolstered by evidence that temptation-goal associations are asymmetric. Re-interpreting the results of Studies 1 and 2 as reflecting semantic category-based associations suggests a bi-directional relationship, whereby temptations activate goals and goals activate temptations. We instead, however, predict that at higher level construals, temptations should activate goals, whereas goals should not reciprocally activate temptations. Thus, whereas Studies 1 and 2 examined temptations facilitating the activation of goals, Study 3 explored goals interfering with the activation of temptations as a function of construal level. We predicted that among those who highly valued their goals, only those induced to higher level construals would demonstrate greater interference in the activation of temptations by goals.

STUDY 3

OVERVIEW

Study 3 was identical to Study 2 with the exception that rather than assessing the activation of goals by temptations, Study 3 assessed the activation of temptations by goals. We predicted that increasing goal value would be associated with greater interference in the activation of temptations by goals, but only among those induced to higher level construals.

METHOD

Participants

Study 3 consisted of 161 (84 women) Ohio State University undergraduate students who completed the study in exchange for course credit. Participants were randomly assigned to condition and were tested in groups of 1 to 4.

Materials and Procedure

Construal-Level Manipulation. As in Study 2, participants in Study 3 generated superordinate ends vs. subordinate means for the actions of improve and maintain good grades and dress well (Freitas et al., 2004; Fujita, Trope et al., 2006).

Lexical Decision Task. Upon completing the construal level manipulation, participants in Study 3 completed a lexical decision-based sequential priming task modified from Study 2. In contrast to Study 2, however, Study 3 presented goals vs. neutral words as primes prior to temptation targets. The specific goal-temptation trial pairings were: diet-cake, slim-chips, thin-sugar, fit-cream, skinny-dessert, slender-cookies, lean-beer. The specific neutral-temptation trial pairings trials were: knee-cake, down-chips, sky-sugar, tie-cream, revised-dessert, troubled-cookies, roll-beer. The goal and neutral primes did not significantly differ in length or frequency (Kucera & Francis, 1967): $t(12) = .97, p = .35$, and $t(12) = .32, p = .75$, respectively. Stimuli and task characteristics were identical to Study 2 in all other respects.

Measurement of Goal Value. To measure dieting value, participants in Study 3 were then asked to report how important each of the seven goal items presented in the lexical decision task were to them ($\alpha = .90, M = 4.66, SD = 1.19$). All items were answered using a 7-point Likert scale (1 = not at all, 7 = extremely) and were averaged to obtain an index of goal value. Upon completion, a funneled debriefing was administered (e.g., Bargh & Chartrand, 2000). No participants reported being suspicious of the relationship between the construal-level manipulation and lexical decision task. Afterward, they were carefully debriefed and dismissed.

RESULTS AND DISCUSSION

Response time data was prepared for analysis using procedures identical to those described in Study 1. The average error rate was 6.3%. Interference scores were calculated by subtracting the average response latencies in the comparison trials (temptation words primed by neutral words) from the average response latencies in the critical trials (temptation words primed by goals). More positive interference scores indicate greater interference in the activation of temptation by goals. We report estimated mean reaction times in Table 1.

Interference scores were regressed on construal level (effects coded: low-level = -1, high-level = 1) and goal value (mean-centered). There were no significant effects of construal level or goal value; however, the results, $\beta = .16, t(157) = 2.04, p = .04$, did reveal the predicted interaction of these variables (see Figure 3). As expected, increasing goal value was associated with greater interference in the activation of temptations by goals only among those at higher level construals β

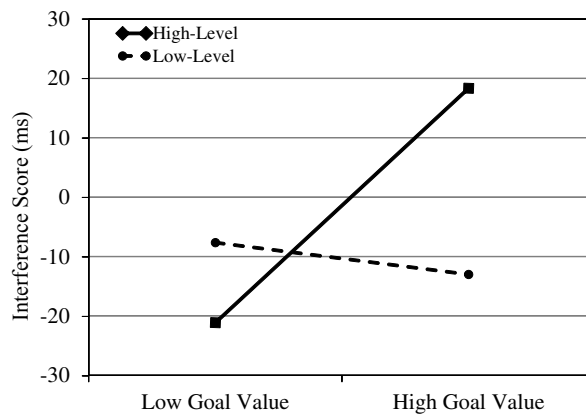


FIGURE 3. Interference scores as predicted by construal level and goal value, graphed ± 1 SD of the mean (Study 3). Higher interference scores reflect greater interference of temptations when primed by goal vs. neutral stimuli. Higher level construals increased interference of temptations by goals, but only when goal value was high.

$=.28$, $t(90) = 2.79$, $p = .006$ and not lower level construals $\beta = -.04$, $t(67) = .31$, $p = .76$. Focusing specifically among those who highly valued dieting (i.e., those 1 SD above the goal value mean), higher level construals led to greater interference in the activation of temptations by goals, $\beta = .22$, $t(157) = 2.02$, $p = .05$. In contrast, for those who did not value dieting (i.e., those 1 SD below the goal value mean), construal levels did not significantly affect activation of temptations by goals, $\beta = -.10$, $t(157) = .87$, $p = .39$.

The results from Study 3 showed that only those construing events at higher level construals demonstrated a heightened interference in the activation of temptations by goals. Focusing in particular among those who valued their goals, higher level construals, relative to lower level construals, demonstrated interference when goals primed temptations. These data suggest that only at higher level construals do people engage those cognitive processes that promote self-control; interference in the activation of temptations by goals was evident only among dieters in the higher level construal condition.

GENERAL DISCUSSION

Previous research has suggested that those concerned with the attainment of valued goals develop functional asymmetric cognitive associations between goals and temptations (e.g., Fishbach et al., 2003). The studies reported in this paper were designed to test the hypothesis that higher level construals would promote the utilization of these functional asymmetric cognitive associations. We predicted that higher level construals would facilitate the activation of goals by temptations and interfere with the activation of temptations by goals as a function of goal value. The results of three studies supported these predictions. In Studies 1 and 2, replicating previous research (Fishbach et al., 2003; Papies et al., 2008), increasing goal value was associated with enhanced activation of goals by temptations; how-

ever, this pattern was evident only among those construing events at higher level construals. This construal-moderated activation of goals by temptations was apparent across two different manipulations of construal levels, and irrespective of whether the goals were represented by goal-relevant objects (Study 1) or the goals themselves (Study 2). Study 3 assessed temptation-goal associations in the reverse direction. Replicating previous research (Fishbach et al., 2003), increasing goal value was associated with heightened interference in the activation of temptations by goals. This interference, however, was evident only among those construing events at higher level construals.

These data suggest an answer to why sometimes even the most highly motivated self-regulators fail in their self-control efforts. Although people may develop and have available to them various cognitive processes that promote self-control, without an appropriate construal of the situation, such processes may not be activated for use. Thus, asymmetric temptation-goal associations may not reflect a rigid, fixed response to environmental cues. Instead, they may represent what Bargh (1989, 1994) labeled conditional automaticity. The three studies we report support this notion by demonstrating that for people to capitalize on asymmetric temptation-goal associations, they need to see the proverbial forest beyond the trees; that is, they need to maintain higher level construals of the situation.

The results of these studies build on a growing literature supporting a construal level approach to studying self-control. Changes in people's subjective construals of events produced marked differences in people's cognitive processing of self-control conflicts. Not only do construal levels moderate the evaluative associations people have of goals and temptations (Fujita & Han, 2009), they also moderate asymmetric temptation-goal associations. Together with other research (Fujita, Trope et al., 2006; Fujita & Han, 2009; Fujita & Roberts, 2010), these studies suggest that people's subjective construals of events play a critical role in the resolution of self-control conflicts. Rather than responding to the objective features of an event in a fixed stimulus-response manner as some treatments of self-control suggest, these studies indicate that people's reactions are determined by their subjective understanding of the event.

Beyond providing additional support for the notion that construal levels are important in self-control, these results may also help to illuminate further the cognitive mechanisms by which construal levels promote self-control decisions and actions. As noted earlier, research has demonstrated that asymmetric temptation-goal associations enhance the likelihood of self-control success (Fishbach et al., 2003; see also Papies et al., 2008; Stroebe et al., 2008). The present findings suggest that higher level construals may promote self-control through the activation of these asymmetric temptation-goal associations.

ON "TRUE" BASELINES

Some readers may be concerned with the lack of a "no construal" baseline control group with which to draw conclusions about the direction and magnitude of the effects of construal levels on asymmetric temptation-goal associations. That is, do higher level construals promote these asymmetric associations, or do lower level construals disrupt them? It is important to keep in mind that the distinction between higher- vs. lower-level construals is a comparative one. That is, the abstract-

ness of any construal lies on a continuum. All conclusions that we draw from our data are thus necessarily relative.

From a conceptual standpoint, it is not clear what a truly appropriate baseline condition would be. Some might suggest that having participants complete the measurement of cognitive associations in the absence of any construal level manipulation might represent an appropriate control condition with which to draw conclusions about the direction and magnitude of the present effects. Note, however, that this assertion rests on an assumption that the construal level manipulations which we employed induce people to construe events more or less abstractly than they generally do. This assumption is problematic. It is possible that the high- vs. low-level construals that our manipulations induce may actually be both more abstract or both more concrete than any baseline construal level. Moreover, the average baseline construal level of study participants may fluctuate on the basis of population characteristics and subtle differences in experimental conditions (for example, see Meyers-Levy & Zhu, 2007, who demonstrated the effects of ceiling height on construal levels). As such, one researcher's effect of concretization may be another researcher's effect of abstraction. These facts render the conceptual basis of any no construal baseline suspect, leading one to be in no better position to draw any stronger conclusions about the direction or magnitude of the present effects. As such, we stress that all of the effects of construal levels on asymmetric temptation-goal associations are relative; we do not and cannot draw any strong conclusions about the true direction of these effects.

Interpreting the present effects also requires noting several differences between the original Fishbach et al. (2003) paradigm and the one that we employed. Fishbach et al. (2003) presented prime stimuli subliminally, followed by a 750 ms inter-stimulus response interval (ISI; time delay between prime and target stimuli). We presented prime stimuli supraliminally with a 350 ms ISI. Research by Papies et al. (2008) has suggested that reducing the ISI weakens asymmetric temptation-goal associations. For example, in one study, they found evidence of asymmetric associations using an ISI of 540 ms, but not 360 ms. That those induced to higher level construals in the present studies evidenced asymmetric temptation-goal associations under conditions in which they may not be expected warrants attention. We interpret this as suggesting that higher level construals were particularly effective in activating those cognitive processes that promote one's global goals, even under suboptimal conditions. Noting differences other than ISI (i.e., subliminal vs. supraliminal prime presentation) and our caveats about true baselines described above, however, we recognize that further research about the basic temptation-goals association effect is clearly needed before making stronger claims about the direction and magnitude of the presently documented moderation.

DEVELOPMENT OF ASYMMETRIC TEMPTATION-GOAL ASSOCIATIONS

Following others (Fishbach et al., 2003; Papies et al., 2008), we have assumed that asymmetric temptation-goal associations develop over time given sufficient motivation to engage in repeated and consistent practice. In performing these studies, we have assumed that participants who valued dieting were proficient enough in their dieting-related self-control to have developed these associations to some degree. Accordingly, we have interpreted our findings as suggesting that higher

level construals promote those asymmetric associations that people have already developed to attain their valued dieting goals.

Future research, however, might directly address this assumption by systematically examining the impact of construal levels on asymmetric temptation-goal associations among those individuals with a history of dieting self-control success vs. failure (for similar treatments, see Fishbach et al., 2003; Papies et al., 2008). We might anticipate that higher level construals promote asymmetric temptation-goal associations only among those dieters with a history of past self-control success (i.e., those who have more likely to have developed over time these functional associations). An alternate intriguing possibility, however, is that asymmetric temptation-goal associations may not require the history of repeated and consistent practice that researchers have generally assumed. Perhaps given sufficient motivation, simply adopting a higher level construal promotes these asymmetric associations, irrespective of one's past history of practice. Rather than reflect a history of repeated practice then, perhaps the asymmetric temptation-goal associations evidenced in past work by those with a history of self-control success reflects an ability of those particular participants to construe self-control conflicts spontaneously at higher level construals. There is some emerging evidence from our lab that people will spontaneously construe events more abstractly when they anticipate encountering temptations that will undermine their valued goals (Fujita & MacGregor, 2010). To what extent this spontaneous re-construal process is automatic and differentiates between those who are successful vs. unsuccessful in their self-control, however, is still unknown and warrants further research.

GENERALIZABILITY OF THE FINDINGS

All three studies that we report in this paper focused on dieting as the focal self-control conflict. The choice of this particular self-control conflict was mostly a matter of convenience sampling: weight control represents one of the most important self-regulatory concerns of undergraduate university students (Ferguson, 2007; Mintz & Betz, 1988). It also appears to represent one of the most common, vexing self-control conflicts reported by Americans (Popular New Year's Resolutions, 2009). Dieting, moreover, represents the domain in which a great deal of recent research on the cognitive processes of self-control have been tested (e.g., Ferguson, 2007; Fishbach et al., 2003; Fishbach & Shah, 2006; Papies et al., 2007, 2008; Stroebe et al., 2008). Although we believe the present findings generalize to other domains, we are cognizant that a more conservative interpretation would limit conclusions to the dieting context. We note, though, that asymmetric temptation-goal cognitive associations have been documented in a number of domains outside of dieting (Fishbach et al., 2003), and that there appears to be little compelling theoretical rationale to expect our findings not to generalize.

Beyond dieting, it is also important to consider the generalizability of our construal level manipulations. Although the present studies utilized two specific manipulations of construal levels, it is important to note that a number of other factors that might influence people's construal levels, and hence their utilization of self-control promoting cognitive mechanisms. CLT proposes that a major deter-

minant of construal levels is the psychological distance of objects and events (e.g., Liberman et al., 2007; Trope et al., 2007). Removing an event in any way from one's direct experience promotes higher level construals. CLT thus suggests that people are more likely to show asymmetric temptation-goal associations when self-control conflicts are more distant along any dimension, including time, space, social distance, or hypotheticality. For example, people should also be less likely to be distracted by temptation-related thoughts when considering goals to be achieved in the distant vs. near future.

A host of other factors beyond psychological distance may also promote more abstract construals. For example, positive vs. negative moods (Gasper & Clore, 2002), states of self-affirmation (Schmeichel & Vohs, 2009; Wakslak & Trope, 2009), third-person vs. first-person visual perspective (e.g., Libby, Shaeffer, & Eibach, 2009; see also Kross, Ayduk, & Mischel, 2005), and even high vs. low ceilings (Meyers-Levy & Zhu, 2007) all appear to engender more abstract construals. In addition, construal levels can be primed and carried-over to subsequent irrelevant events, a phenomenon upon which the studies reported in this paper capitalized (Förster et al., 2004; Freitas et al., 2004; Fujita, Trope et al., 2006). Any and all of these should be viewed as potential determinants in whether people evidence asymmetric temptation-goal associations.

Research has also shown individual differences in the construal of events (e.g., Freitas et al., 2001; Levy et al., 2002; Vallacher & Wegner, 1989). Those who chronically represent events in higher level terms should be expected to display greater asymmetries in temptation-goal associations. As suggested earlier, perhaps those individuals who report having a history of self-control success and demonstrate the largest asymmetric temptation-goal associations in previous studies (Fishbach et al., 2003; see also Papies et al., 2008; Stroebe et al., 2008) are those who chronically construe events at higher level construals.

CONCLUSION

An important goal of self-control research is to understand the cognitive processes that promote vs. impair self-control efforts. The studies reported in this paper suggest that people's subjective construals of events play a critical role in determining when functional cognitive processes such as asymmetric temptation-goal associations are likely to be utilized to promote self-control. Broadly speaking, these findings suggest that to generate better interventions and policies, researchers will have to better understand the critical role people's subjective construals of events have on the cognitive processes that underlie self-control decision-making.

APPENDIX. CRITICAL STIMULI USED IN STUDY 1

Goal Stimuli: spinach, apple, broccoli, lettuce, yogurt, granola, wheat, peas, fruit, vegetable, radish, fiber, carrot, salad, celery, oranges, tofu, bran, tomato, grapes

Temptation Stimuli: beer, cookies, fries, sugar, nachos, dessert, cake, bacon, chips, pizza, hamburger, fast food, candy, cheeseburger, sweets, soda, bar, cream, pancakes, buffet, butter, syrup, chocolate

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