Antecedents, Consequences and Lay Theories of Counteractive High-Level Construal in Self-Control Contexts

Dissertation

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Abstract

People often abandon their larger long-term goals when presented with smaller, yet more immediate rewards. Research on construal level theory (CLT; Trope & Liberman, 2003) suggests that these types of self-control failures are more likely when individuals are induced to mentally represent events through concrete, lower-level construal processes, compared to more abstract, goal-relevant, high-level construal processes (e.g. Fujita, 2008). However, CLT is based on the notion that when people are left to their own devices, objects and events that are psychologically close tend to be construed in concrete, lower-level terms, whereas those that are psychologically distant are construed in relatively more abstract, high-level terms (Trope & Liberman, 2003; 2010). Such a tendency would promote self-control failure when encountering imminent self-control conflicts.

The present research proposes the existence of mechanisms that allow people to “break” this association between distance and construal, permitting high-level construal of imminent goal threats as a means of counteractive control. Four experiments suggest that people evidence counteractive high-level construal of proximal temptations when they are motivated, anticipate goal threats, and have no other means of control available. A fifth study offers preliminary evidence that counteractive high-level construal promotes self-control behavior. These studies offer initial evidence for counteractive high-level
construal, suggesting two possible, unexplored breakdown points in the self-control process. Some people may fail at self-control either because they lack the knowledge that high-level construal would help or because they lack the ability to engage this process when it would be advantageous. Two additional studies began to explore the first of these possibilities by assessing participants’ lay theories about the role of construal levels in self-control contexts. Implications for construal level theory, self-control, and the measurement of construal levels are discussed.
Dedicated to my family, Alpin, Sharon, Mary, and Scott MacGregor, whose sacrifices and support have made every good thing in my life possible.
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Chapter 1: Introduction

Temptations are everywhere. Every choice to eat a salad for lunch instead of pizza, to go to the gym instead of relaxing on the couch, or to save one’s money instead of buying the newest electronic gadget on the market requires self-control. In the United States alone, over $60 billion is spent annually on diet programs and exercise equipment (Olson, 2011), yet obesity is on the rise, now surpassing smoking as the leading cause of preventable illness (Jia & Lubetkin, 2010). In addition, although 65% of US households own at least one flat screen TV (Sturgeon, 2010), fewer than 40% of Americans report being on track to have adequate retirement savings (Greenhouse, 2012). The variety and magnitude of costs associated with self-control failure clearly establish the identification of ways to enhance self-control as an important and valuable objective. However, given the plethora of opportunities to indulge, it is unsurprising that people are often lured into temptation. It is perhaps more remarkable that they are so successful in avoiding falling prey to such enticements. Although cookies taste good, people do not eat them after every meal, and although parties are fun, college students spend many nights studying instead. An important step in promoting self-control may involve developing a clearer understanding of what factors allow individuals to be successful. That people are able to overcome the pull of immediate temptation to succeed in their self-control efforts suggests that they have mechanisms at their disposal to help promote their goals in spite
of temptations. Drawing from research on construal level theory (Trope & Liberman, 2003) and counteractive control theory (Trope & Fishbach, 2005), it seems possible that one such cognitive mechanism remaining unexplored in the literature is counteractive high-level construal. In the present research, the first five studies attempt to document this mechanism, and to assess the circumstances under which it is more or less likely to be evident. Furthermore, with an eye toward potential application as a diagnostic tool or intervention technique, two additional studies explore the capacity to recognize the benefits of counteractive high-level construal for self-control.

**Self-Control**

In any given situation, people must decide which of their many goals to pursue. People sometimes choose to pursue proximal goals, which can be attained through a single behavior and are more rewarding in the here and now than at a distance. Enjoying cheesecake is one such proximal goal. It can be attained with a single action (i.e. choosing to eat a piece of cheesecake instead of an apple), and although it is immediately rewarding, the benefits are limited to the moment at which the cheesecake is consumed. We tend to live our lives in the present, moving from one “here and now” to the next, so immediate access to rewards makes it easy to understand why people pursue this type of goal. However, many of the goals people strive for offer few or no immediate rewards, instead revealing their larger benefits only through multiple goal-consistent actions across diverse circumstances. Although pursuit of these distal goals is less pleasant in the moment than pursuit of proximal goals, the rewards associated with distal goals tend to be relatively more valuable. This greater value can stem from the magnitude of the
reward attained from eventually achieving the goal. For example, Olympic athletes must be dedicated on a daily basis, often performing tasks that are not enjoyable in the moment with the aim of one day winning a medal. The rewards associated with this moment of victory are of greater magnitude than the immediate rewards of laziness, making the distal goal more valuable. However, in some cases distal goals are more valuable because their rewards extend beyond the situation in which the goal is attained. For instance, losing 20 pounds cannot be achieved by choosing an apple over cheesecake once. One must instead repeatedly make similar choices in varied situations. In any single choice context, cheesecake may offer greater rewards than an apple. However, the health and self-esteem benefits of finally reaching one’s weight-loss goal are likely to extend across a variety of domains and to be experienced long after stepping off the scale, making the distal goal more valuable.

Self-control conflicts occur in situations where distal and proximal goals compete, such that people must decide to pursue one goal at the expense of the other. In such circumstances, pursuit of distal goals often poses a challenge because their rewards are not immediately evident, whereas the rewards associated with conflicting proximal goals are salient and tempting right away. Successful self-control requires choosing options that promote more distal ends despite the allure of more proximal desires. Self-control failure entails the opposite: opting for rewards that can be attained in the here-and-now at the expense of more valuable yet distal goals.

**Construal levels and self-control**
**Psychological distance and self-control.** One feature known to characterize self-control decisions is temporal malleability. In immediate choice contexts, when temptations are present, the lure of impending rewards often prevails over pursuit of distal goals, leading to self-control failure. However, people’s choices are more consistent with their distal goals and values when they are made in advance of the conflict situation. When temptations are more distant, the drive to indulge is reduced, making the choice to exert self-control by following distal goals an easier one. As a result, the dieters’ decision of whether to eat a piece of cheesecake or an apple for a snack may depend on when the choice is made. If choosing the snack for next week, dieters can select the option that complements their weight-loss goals (i.e. the apple) without difficulty. However, this goal-consistency often disappears when next week becomes today and the snack choices are immediately available; the immediate opportunity to indulge in the extravagance of cheesecake may tempt individuals to discard their dieting goals. These time-sensitive preference reversals have been documented repeatedly in the literature and are considered to be a hallmark of self-control conflicts (Ainslie, 1975; Fujita, 2011; Hoch & Loewenstein, 1991; Metcalfe & Mischel, 1999; Mischel, Shoda, & Rodriguez, 1989; Rachlin, 1995; Strotz, 1956; Thaler & Shefrin, 1981).

Research on CLT suggests that these preference patterns may result from the effects of time on how people interpret, or construe, objects and events (Liberman & Trope, 2008; Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2003; 2010). The term "construal" has multiple definitions. Construal can be understood as a process by which people derive meaning from their experiences, or alternatively as the
representational outcome of this process. Construal level theory (CLT) is based on former rather than the latter interpretation, and more specifically on the notion that the construal process can vary in the extent to which it involves abstraction.

Immediate circumstances are replete with specific information that is conducive to forming contextualized mental representations of one’s experiences (low-level construal). Low-level construal is a primarily bottom-up process in which representations are guided by immediate salience. Thus, for proximal events, people can and do engage in low-level construal to highlight the salient, concrete information that makes each situation unique. Considering this information allows people to effectively understand and make decisions about such events. However, people often wish to reflect on and plan for future events, and the rich detail of the present tends to be less available the farther into the future those events are to occur. High-level construal involves primarily top-down, goal-directed representational processes that are more useful for considering distant events. Through selective inclusion of goal-relevant information, high-level construal captures the essential and defining features consistently evident in all manifestations of an event, without any reliance on specific details. So, because they lack contextualized information, cognitive abstraction (high-level construal) is required to understand distant events.

However, even if they were able to do so, people would not want to construe distant events through lower level processes. This is because engaging in concrete construal is less likely to be useful or informative for such events. For instance, research by Liberman and Trope (1998) indicates that people prefer to base decisions about the
future on the desirability information evident through high-level construal (e.g. interest value of a class project) rather than the feasibility information available through lower level processes (e.g. difficulty of the project), but the reverse is true for decisions about the here and now. In addition, details about distant events are fairly changeable, whereas the gist is consistent by definition, so people stand to gain more reliable information by construing distant events abstractly. Therefore, temporal distance becomes associated with high-level construal both because concrete details are lacking for future events, and because the abstraction process provides consistent information more likely to be both useful and desirable for individuals considering objects and events at a distance.

This association between distance and construal level is also evident across spatial distance (e.g. Columbus, Ohio vs. Tokyo, Japan), social distance (e.g. my sister vs. a stranger), and hypotheticality (e.g. real events vs. imagined events), such that the further one moves from the present self on any of these dimensions, the less contextualized information one has available, and the less useful or desirable concrete representational processes are likely to be (e.g. Liberman & Trope, 2008; Trope & Liberman, 2010). CLT thus suggests that this association between the construal process and temporal distance applies to these other forms of psychological distance as well. Furthermore, this link is also theorized to be overgeneralized, such that people use high-level construal to represent psychologically distant events and low-level construal to represent psychologically proximal events, even when the amount and quality of available information is held constant (e.g. Bar-Anan, Liberman, & Trope, 2006; Amit, Algom, & Trope, 2009).
Extensive evidence supports the notion that psychological distance impacts construal. For example, with increasing temporal distance, people are more likely to classify objects into fewer, broader categories (Liberman, Sagristano, & Trope, 2002), to understand their own self-concepts as more structured and cross-situationally consistent (Wakslak, Nussbaum, Trope & Liberman, 2006), and to infer broad dispositional traits from single instances of others’ behavior (Nussbaum, Liberman, & Trope, 2003; Rim, Uleman & Trope, 2009). As spatial distance increases, people tend to describe observed behavior using more abstract language, and to divide ongoing actions into fewer, broader behavioral units (Henderson, Fujita, Trope & Liberman, 2006), and increasing social distance, through enhancing perceptions of power, leads to greater breadth of categorization (Smith & Trope, 2006). These findings demonstrate that increasing psychological distance leads to more abstract processing (i.e. high-level construal).

Additional research suggests that construal level has important implications for decision-making and behavior. For instance, as high-level construal promotes understanding decisions and events in light of their broader implications, people who engage in high-level rather than low-level construal are more likely to recognize the instance at hand as relevant to their global values (e.g., Eyal, Liberman, & Trope, 2008). This leads them to exhibit greater consistency between their values and their behavioral intentions (e.g., Eyal, Sagristano, Trope, Liberman & Chaiken, 2009; Torelli & Kaikati, 2008). However, more pertinent to the present research, high-level construal has also been shown to promote self-control (see Fujita, 2008, for review).
High-level construal promotes self-control. The time-sensitivity that characterizes self-control decisions can be explained, from a CLT perspective, by the effect of temporal distance on construal. Increasing temporal distance from an event promotes high-level construal. When the event is a self-control conflict, a person’s goals determine the defining features, so high-level construal processes highlight the global, goal-relevant implications of one’s choices relative to their local rewards, thereby promoting self-control success. Enhancing the temporal proximity of an event, on the other hand, fosters low-level construal, which highlights the salient, unique and often goal-irrelevant features of a choice context, reducing the relative impact of one’s goals. The tendency toward low-level construal when facing an imminent self-control conflict therefore leads the rich indulgence of temptation to be favored over the smaller immediate rewards of goal consistent action, increasing the likelihood of self-control failure. As a result, CLT suggests that in immediate choice contexts, successful self-control requires overriding the typical distance-abstraction association to adopt the mental perspective afforded by increased temporal distance, i.e., high-level construal.

To illustrate the role of construal levels in self-control, consider once again the dieters’ choice of whether to snack on an apple or a piece of cheesecake. If dieters were to make this decision on the basis of salient concrete features, such as taste (low-level construal), they might select the cheesecake over the apple. Appreciating the broader implications of the choice through engaging in high-level construal, however, would lead dieters to understand this decision as one between weight loss and hedonism. As dieters presumably value weight loss over hedonism, they should prefer the apple over the
cheesecake in this choice context. These predictions are specific to dieters, as varying construal level among non-dieters would likely have no effect on this type of choice. In the absence of a dieting goal, there is no reason for people to choose the apple, so the behavioral implications of high- and low-level construal would not differ, with both favoring choice of the cheesecake. High-level construal structures available information around one's distal goals through an abstraction process that preferentially weights goal-relevant over goal-irrelevant information. In this way, high-level construal allows people to transcend their current experience, and highlights any existing relevance of their broader goals and values to the instance at hand.

In support of this notion, numerous studies have demonstrated that experimentally inducing high-level construal promotes self-control (e.g. Agrawal & Wan, 2009; Fujita & Han, 2009; Fujita, Trope, Liberman, & Levin-Sagi, 2006; Malkoc, Zauberman, & Bettman, 2010; Schmeichel & Vohs, 2009). For example, in one study, Fujita and Han (2009) recruited female undergraduate students, who frequently cite weight loss as an important goal (Mintz & Betz, 1988), and asked them to generate superordinate (high-level) ends achieved by an action (e.g., “protect the environment” for the action “recycle”) or subordinate (low-level) means by which to achieve that action (e.g. “sort trash”). Research has demonstrated that these procedures reliably promote high vs. low-level construal of subsequent unrelated events (e.g. Freitas, Gollwitzer & Trope, 2004; Fujita et al. 2006). As predicted, Fujita and Han found that high-level construal increased preferences to eat an apple over a candy bar, suggesting enhanced self-control.
Further evidence that high-level construal improves self-control comes from Fujita and colleagues (2006), who manipulated construal by giving participants a set of 40 everyday objects (e.g. dog) and asking them think of either superordinate categories (e.g. pet) or subordinate exemplars (e.g. Lassie) for each object, procedures shown to reliably induce high- and low-level construal mindsets respectively (e.g. Fujita et al., 2006). These undergraduate participants were then asked to evaluate various stimuli, some of which were temptations that frequently interfere with students’ studying efforts (e.g., beer, movie, party). High-level construal prompted more negative evaluations of these specific stimuli. Just as important, there was no effect of construal level on responses to stimuli unrelated to studying (e.g., rainbow, metal, cockroach), suggesting that these negative evaluations of temptations were in service of self-control. The effect of construal, moreover, was evident only among those who valued academic achievement, and had no effect among those unconcerned about school. These data thus indicate that high-level construal promotes self-control by enhancing people’s appreciation for the relevance (if any) of their global goals to the situation at hand.

The experimental manipulation of high- versus low-level construal has thus been shown to systematically impact self-control in a variety of domains. However, when such experimental manipulations are absent, CLT suggests that proximal temptations should prompt low-level construal. In the real world, the association between temporal distance and construal level may thus render people susceptible to self-control failure at moments when such a vulnerability would be most detrimental for self-control, when temptations are physically present.
Counteractive control

As previous research and theorizing on CLT seems to suggest, people do fail at self-control more frequently than they might consider ideal. However, they are also regularly able to overcome temptation in pursuit of their goals. Thus, it seems plausible that psychological mechanisms exist which allow people to overcome the tendency for proximal temptation to trigger low-level construal. This hypothesis is based in part on counteractive control theory, which suggests that people possess various cognitive and behavioral mechanisms allowing them to overcome self-control conflicts that threaten to undermine their valued goals (Fishbach & Trope, 2005; 2008; Trope & Fishbach, 2000; 2005). For example, people precommit to self-control by intentionally placing penalties on their own potential self-control failures, thereby increasing the costs of giving in to temptation and motivating greater self-control effort, and individuals have also been shown to make valued rewards contingent on self-control success, thereby amplifying the benefits of avoiding temptation (e.g., Ainslie, 1975; Rachlin & Green, 1972; Thaler & Shefrin, 1981; Trope & Fishbach, 2000; Wertenbroch, 1998).

Use of these strategies is evident in numerous real-world examples across a variety of domains. For instance, people purchase alarm clocks that donate money to hated charities each time the snooze button is pressed, and they enroll in fitness programs like “gym-pact” in which fees are paid based on the number of times people miss their scheduled workouts, and those who do manage to attend are rewarded with the profits. They also join programs like weight watchers in which public weigh-ins threaten embarrassment and enforce accountability for insufficient progress toward diet goals,
while also promising accolades for those who are successful. Furthermore, people deposit money into “Christmas Club” accounts, forgoing the interest available in other savings accounts, and agreeing to pay high early withdrawal fees to ensure that they cannot spend their money irresponsibly (Thaler & Shefrin, 1981). People thus engage in counteractive control to protect their goals from being undermined by future temptation.

Use of counteractive control strategies is largely determined by people’s level of motivation to pursue their distal goals; as this motivation increases, people become more likely to engage in behavior like self-imposed punishment to protect those goals from temptation (Trope & Fishbach, 2000). Similarly, the perceived magnitude of goal threat posed by a particular temptation is also relevant, as people feel compelled to counteractively defend their goals only when a situation has the perceived potential to compromise them. For instance, Trope & Fishbach (2000) found that people who valued health were more willing to make receiving a bonus contingent on completing a cardiovascular test when they believed the test would be physically unpleasant, compared to those who were told the test would cause minimal discomfort. People tended to use counteractive control only when they felt their proximal desire to avoid physical discomfort might prevent them from attaining the distal goal of receiving valuable health information. Finally, counteractive control processes are also influenced by the presence or absence of alternative means of goal protection. If external forces are in place to prevent indulgence in temptation, people have little reason to initiate internal forms of counteractive control, but people feel a stronger need to protect their goals to the extent that insufficient outside forms of control are evident. For example, after being reminded
of various distractions from studying, students who were asked to consider why other people expected them to work hard in school were less likely to bolster the value of studying than were those who were asked to consider their own reasons for working hard (Fishbach & Trope, 2005).

In addition to the various behavioral forms of counteractive control described above, more recent research has suggested the existence of less deliberative, cognitively-based counteractive control mechanisms. Fishbach and colleagues, for example, have suggested that people develop asymmetric temptation-goal cognitive associations, such that the activation of temptation concepts activates goal concepts, whereas the activation of goal concepts does not reciprocally activate temptation concepts (Fishbach, Friedman, & Kruglanski, 2003; see also Papies, Stroebe & Aarts, 2008). This asymmetric associative pattern promotes the cognitive accessibility of goals over temptations, which in turn promotes self-control. For example, as a function of these asymmetric temptation-goal associations, exposure to temptation cues (an issue of Chocolatier magazine) can be as effective as goal cues (an issue of Shape magazine) in promoting goal-consistent behavior (choosing an apple over a chocolate bar as a snack; Fishbach et al., 2003). Similarly, Fishbach and colleagues have also found evidence of asymmetric shifts in subjective evaluation of goals and temptations, such that temptation cues enhance perceived goal value, whereas goal cues reduce the subjective value of temptations (Fishbach, Zhang, & Trope, 2010; see also Fishbach & Shah, 2006). Research thus suggests that people develop cognitive mechanisms that help to offset the negative impact of temptations on goal pursuit.
Counteractive high-level construal

Although some processes are in place to promote goal pursuit, existing CLT research suggests a goal-undermining flaw in the way people react to imminent temptations. Since the draw of temptations is strongest when they are immediately available, it is under these circumstances that the goal promoting features of the high-level construal process would be most advantageous for self-control. However, as reflected in the link between psychological distance and abstraction that forms the foundation of CLT, proximal temptations typically prompt low-level construal. It seems difficult to integrate this tendency with the fact that people are so often successful in overcoming imminent temptation. However, melding CLT with counteractive control theory may help to resolve this apparent inconsistency. Although imminent temptation may generally provoke low-level construal, people may be capable of developing cognitive structures that instead prompt high-level construal processes under such circumstances. This would allow high-level construal to operate like a cognitively-based means of counteractive control, working to offset the destructive effects of proximal temptation on goal pursuit. This type of cognitive mechanism would help to explain the relative pervasiveness of self-control success despite the ubiquity of temptation, but the present studies are the first to explore this possibility of counteractive high-level construal.

Construal Measurement

Measuring content versus process. In order to study counteractive high-level construal, it is necessary to develop effective measures to assess construal level.
However, the high and low-level processes themselves are difficult to capture directly. Cognitive processes are often assessed by examining their outputs. Indeed, it has been common practice in the construal level theory literature to use behavioral descriptions varying in abstraction, often based on the behavioral identification form (BIF; Vallacher & Wegner, 1987, 1989), to measure construal (see Burgoon, Henderson, & Markman, in press, for review). For instance, to assess construal of *taking part in a cookie taste test*, participants might be asked to report whether *eating cookies* (concrete identification) or *participating in marketing research* (abstract identification) seemed like a better description of the task.

However, the specific contents comprising the final representational outcomes of both high and low-level construal processes are subjective and unique to each individual, making them difficult to precisely identify in advance. For example, whereas one dieter engaging in high-level construal may represent *taking part in a cookie taste test* as *participating in marketing research*, another dieter construing at a high level might see the same taste test as *being tempted*. Therefore, if presented with the construal measure described earlier (i.e. the choice between describing the taste test as *eating cookies* or *participating in marketing research*), it is easy to see why the first dieter would prefer the abstract option, as it matches his or her representation exactly. It may, however, seem more difficult to predict how the second dieter would decide between the two options, as neither one matches his or her representation completely.

To understand why the second dieter would also be expected to select the more abstract description, it is important to note that, although high-level representations of an
event can differ in their details (e.g. representing a cookie taste test as being tempted or as participating in marketing research), they are consistent in that they are based on the process of abstracting from a specific instance. Therefore, although one cannot be sure exactly what the final high-level representation of a self-control conflict will look like for a particular individual, theoretically, there should be features that distinguish it from a corresponding low-level representation, and these distinguishing features may be captured by the same type of measure. For instance, higher-level construal should generally lead to more abstract representations, so an abstract (versus concrete) description of an event should seem like a better fit to those engaging in high as compared to low level construal, even if the specific abstract description provided does not match his or her representation exactly. Based on this assumption, in a preliminary attempt to capture spontaneous construal processes, measures reflecting the distinct outcomes of those processes will be used,

**Potential drawbacks of content-free measures.** Another common means of assessing construal level involves using measures of global versus local processing style (see Burgoon et al., in press), mindsets that have been empirically linked to high and low-level construal respectively (e.g. Liberman & Förster, 2009; Förster & Dannenberg, 2010). The tools used to assess these processing styles are relatively content free, capturing general mindsets with little or no direct connection to the specific goal an individual is pursuing. For instance, the Navon letter task is often used (Navon, 1977). In this task, participants are presented with a series of figures that contain a large letter made up of several copies of the same smaller letter (e.g. an H made up of Fs). They then
report, as quickly as possible, which of two letters the figure contains, only one of which is actually present. Whether the correct letter option matches the global target (larger letter) or the local target (smaller letters) is varied across trials. Faster reaction times to global versus local targets reveals a global processing style, whereas the reverse indicates a local processing style.

These types of measures have been shown to effectively assess construal level in the past (e.g. Liberman & Förster, 2009; Marguc, Förster & Van Kleef, 2011; Förster & Dannenberg, 2010), and one could argue that their lack of content provides a cleaner assessment of the construal process. However, there is reason to doubt their effectiveness for assessing counteractive high-level construal. For example, because they are content free, these measures are guaranteed not to match the precise contents of an individual’s high or low-level representation. Therefore, assessing construal level through global versus local processing styles is necessarily subject to the same criticism that can be levied against content-based measures of construal. In addition, if people spontaneously engage in high-level construal processes to counteract anticipated goal threats, then the process may function exclusively to offset the specific self-control conflict an individual is facing. Effective measures may thus need to be conflict-relevant in order to capture such a conflict-specific response. For example, if dieters are construing a taste test through higher levels to overcome the temptation to eat too many cookies, this process may not influence their responses to a motivationally irrelevant Navon letter task. Therefore, counteractive high-level construal may not show up with more general mindset measures, on which there is no “reason” to construe at higher-levels. Because
the current studies are intended to explore the existence of these counteractive processes, they will not include content-free measures, which may be insensitive to such motivations.

**The role of what is being construed.** It is also useful to consider that, although a self-control conflict may be necessary to initiate the process of counteractive high-level construal, the construal process can be effectively applied to any aspect of the conflict situation. That is, regardless of whether individuals abstract on the temptation, the goal-relevant action, or the conflict situation in general, what is important is that they are abstracting to offset the effects of an impending goal threat. Therefore, counteractive high-level construal could theoretically be evidenced through abstracting on any component of the goal-threatening event.

**Spontaneous Construal and Goal Pursuit**

Previous research broadly supports the notion that spontaneous initiation of high-level construal can be goal-directed. (e.g. Marguc, Förster & Van Kleef, 2011; Ayduk & Kross, 2010). Marguc and colleagues (2011) demonstrated that when obstacles thwart goal progress, people spontaneously adopt high-level construal, a process likely to aid the search for other avenues to goal attainment. For instance, in one study, Marguc and colleagues found that people whose preferred path was blocked in a maze task showed faster reaction times to global versus local targets on the Navon letter task (Navon, 1977) than those whose pathway remained clear.

Similarly, Ayduk and Kross (2010) found that people spontaneously display a process similar to high-level construal when making sense of negative past experiences.
This involves psychologically distancing themselves from these unpleasant events, a process that promotes adaptive coping and reduces rumination. For example, people who adopted a self-distanced perspective (i.e. a fly on the wall observing events) when considering an interpersonal rejection were more likely to report finding closure and feeling less upset by the experience than those who employed a self-immersed perspective (i.e. an actor directly experiencing events). This notion of self-distancing seems largely consistent with psychological distance, however the extent to which the concepts captured by this measure actually reflect construal level are as yet untested. Nonetheless, these two distinct lines of research offer suggestive evidence that people may be capable of engaging in high-level construal when advantageous for self-regulation.

Although these examples suggest that spontaneously engaging in high-level construal processes can aid in goal pursuit, it is important to recognize that the self-regulatory issues addressed in this past work are conceptually distinct from self-control. As described previously, self-control involves a dual-motive conflict in which people must choose which motive to pursue (e.g., Ainslie, 1975; Fujita, 2011, Rachlin, 1995; Thaler & Shefrin, 1981). When facing a self-control conflict, people feel drawn to seek both proximal rewards (e.g. cheesecake), with short-lived immediate benefits, and mutually exclusive distal rewards (e.g. weight loss) with larger benefits evident outside of the present circumstances. The search for alternative means, by contrast, represents a single-motive context: people know what they want but must determine how to attain that end. Likewise, when considering negative past events, the motive to feel better about the
situation is unlikely to be pitted against any opposing drive to feel worse, making the context addressed by Kross and colleagues another example where a single motive is at play. Dieters may sometimes have to choose between eating carrots or blueberries as a snack, but this decision does not rely on self-control as both options represent means to the same end (weight loss). Spontaneous high-level construal may promote positive resolutions to these single-motive self-regulatory challenges as well, but the current studies are intended to explore their role in resolving self-control conflicts. Although it would seem functional if people could use high-level construal counteractively when they anticipate encountering self-control conflicts, it is unclear whether they actually do this, and the present studies will address this question.

**Recognizing the Role of Construal Level in Self-control**

This type of spontaneous high-level construal may play a critical role in understanding how people are able to successfully exert self-control in real world conflict situations. However, regardless of whether or not empirical support for counteractive high-level construal emerges, there is clear evidence that high-level construal is advantageous for self-control (e.g. Fujita et al., 2006; Fujita & Han, 2009). As a result, people may possess lay theories about the role of construal levels in self-control contexts. Therefore, in addition to assessing if people actually use high-level construal counteractively, a secondary aim of this research will involve exploring whether people believe/understand that high-level construal is beneficial for self-control.

If self-control success is more likely when one construes a conflict situation in high-level terms, then it is possible that through repeated, even accidental, pairings
people learn to associate high-level construal with self-control success, and/or low-level construal with self-control failure. This type of association may be one means by which people can come to recognize that engaging in high level construal of self-control conflicts aids in their successful resolution, with individuals who have experienced more self-control success being more likely to develop such knowledge. In addition, understanding the benefits of high-level construal processes for self-control may promote the spontaneous construal of impending self-control conflicts in this manner. That is, just as successful revival of a heart attack victim first requires knowledge of CPR, it is possible that successful self-control in real world contexts first requires knowledge that high-level construal promotes self-control. Some indication that awareness of self-control strategies may increase their likelihood of use comes from work by Mischel and colleagues. In one set of studies, children were shown to exhibit better self-control with increasing age (Mischel & Metzner, 1962), and in a separate set of studies increasing age was also associated with greater ability to identify effective self-control strategies. Finally, an additional program of research demonstrated that teaching children to use effective distraction strategies enhanced delay of gratification (Moore, Mischel & Zeiss, 1976). Taken together, these findings suggest that greater ability to recognize the benefits of a self-control strategy may improve the capacity to use it, while also raising the possibility that strategies promoting successful self-control can be explicitly taught.

To be clear, understanding the advantages of high-level construal for self-control is not necessarily a prerequisite for the development of counteractive high-level construal. It is possible that people could develop this association and demonstrate
counteractive high-level construal in advance of self-control conflicts without ever explicitly realizing what they are doing or why they are doing it. For instance, as demonstrated in research on the somatic marker hypothesis (Bechara, Damasio, Tranel & Damasio, 1997), people are sometimes able to engage in advantageous behavioral responses without explicit knowledge of the strategy they are using. In addition, there is even evidence that conscious monitoring can sometimes disrupt the successful operation of unconscious processes (e.g. Beilock & Carr, 2001), suggesting that to the extent that counteractive high-level construal is a highly proceduralized skill, metacognitive awareness of the process may even undermine it.

Nonetheless, if people do develop an awareness or intuition that high-level construal of a conflict situation is more likely to yield a positive resolution than low-level construal, this could potentially enhance self-control success. If successful people are more aware of these benefits of abstraction than those who tend to be unsuccessful at self-control, this could suggest the lack of such metacognitive awareness as a deficiency to be profitably targeted for intervention. Furthermore, if recognizing the implications of high-level construal for self-control is associated with self-control success, education may serve as a viable therapy for those who chronically fail at self-control, whereas if knowledge plays no role in counteractive high-level construal, intervention may prove more difficult. Thus, with an eye toward future diagnostic and intervention strategies, the present research will also explore the possibility that people are able to recognize the benefits of high-level construal for their self-control efforts.

**Present Research**
Five initial studies will attempt to demonstrate that despite the general inclination to represent proximal events using low-level construal, people can and do engage in high-level construal when they anticipate an imminent self-control conflict. To the extent that it represents a cognitively-based means of counteractive control, high-level construal should be evident when people are sufficiently motivated to pursue the threatened goal (Study 1), when they are aware that a valued goal will be threatened (Study 2), when other, external forms of control are unavailable (Study 3), and when proximal rewards are tempting (Study 4). When activated, this counteractive high-level construal should also promote successful self-control behavior (Study 5).

Two additional studies will then assess the extent to which people are capable of recognizing that high-level construal is beneficial for self-control. If people do possess this knowledge at some level, they should understand that the usefulness of high-level construal applies specifically to self-control conflicts (Study 6), and this recognition should be more pronounced to the extent that individuals tend to be successful in their self-control efforts (Study 7).
Chapter 2: Antecedents and Consequences of Counteractive High-level Construal

Study 1

If high-level construal serves as a means of counteractive control, then this process should be initiated to the extent that individuals are motivated to exert self-control. Although proximal temptations typically are inherently motivating, without sufficient motivation to pursue the opposing distal goal there would be no self-control conflict and therefore nothing to instigate high-level construal. Thus, Study 1 included a manipulation of the extent to which participants who anticipated taking part in a tempting cookie taste test were motivated to pursue the distal goal of weight loss. This was accomplished by altering participants’ perceived discrepancy from their ideal weight. Individuals led to perceive a large discrepancy from their ideal weight would be more motivated to lose weight, and would thus be more likely to experience the cookie taste test as a self-control conflict than those led to perceive a small discrepancy. After participants completed this goal motivation manipulation, they were asked to report their construal of the upcoming cookie taste test. Participants induced to feel a stronger drive to lose weight were expected to be more likely to construe the taste test via high-level construal processes as a means of counteractive control.

Method
Participants. Eighty-seven students (62 females) in an introductory psychology course at The Ohio State University took part in this study in return for course credit.

Materials and procedure. Participants, in groups of up to 12, were seated at individual computer workstations and were told they would be completing a short questionnaire assessing their preferences and opinions. They were also led to believe they would be taking part in a cookie taste test later in the session. Participants were informed that the cookies they would be testing were designed to maximize taste, but were also extremely unhealthy, with 370 calories and 15 grams of fat each. A bowl of chocolate chip cookies was visible on the desk of each workstation, and participants were told that they would later be able to eat as many of these cookies as they chose.

Participants were then asked to report the number of pounds that they would need to lose to reach their ideal weight. This question was always answered on a 7-point scale, but the response options varied depending on condition. Half of the participants were randomly assigned to a condition in which response options ranged from 0 pounds to 5 or more pounds (narrow scale), whereas the other half were assigned to a condition in which response options ranged from 0 pounds to 91 or more pounds (wide scale). The narrower range of response options was designed to promote selection of higher scale points, thereby enhancing the perceived discrepancy from one’s ideal weight relative to the wider range (e.g., Fishbach & Dhar, 2005). Therefore, those who completed the narrow scale should be more motivated to lose weight and thus more likely to perceive the cookie taste test as a self-control conflict.
After completing this manipulation, participants’ construal of the upcoming taste test was assessed using a measure of action identification, based on the Behavioral Identification Form (Vallacher & Wegner, 1989). They were presented with three paired abstract and concrete descriptions of the upcoming cookie taste test. For each pair, individuals were instructed to mark the option that best corresponded to the way that they were thinking about the impending taste test. Response options were comprised of: “eating cookies” vs. “trying new products,” “chewing a cookie” vs. “trying out a new snack,” and “tasting cookies” vs. “participating in marketing research.” Each of these pairs was presented on a 5-point scale ranging from the concrete (low-level) option to the abstract (high-level) option. Although this measure may not capture the exact contents of the representation that participants will form, high-level construal processes should yield more abstract representations than low-level construal processes, and the measure is intended to tap this difference in abstractness as well. In theory, participants will perceive the option that more closely matches the abstractness of their representation as more appropriate. Upon completion of this construal measure, participants were informed they could eat the cookies in front of them, and were then debriefed and dismissed.

**Results**

Analysis of the action identification items indicated adequate reliability (Cronbach’s α = .72), and they were averaged to create an index of construal level, with higher numbers indicating higher-level construal (M = 2.46, SD = 1.05). That the perceived goal progress manipulation was indeed successful is supported in part by the values participants endorsed on the wide vs. narrow scales: those who responded using
the narrow scale selected higher ideal weight discrepancy values \( (M = 5.29) \) than those who responded on the wider scale \( (M = 1.26) \), \( t (85) = 10.87, p < .001, r = .76 \).

Accordingly, an independent-samples t-test was performed analyzing construal level as a function of perceived weight discrepancy. Participants assigned to the narrow scale condition showed stronger preferences for abstract descriptions \( (M = 2.67) \) than did those in the wide scale condition \( (M = 2.23) \), \( t (85) = 2.00, p = .05, r = .21 \) (see Table 1).

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Low (SD)</th>
<th>High (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating cookies vs. Trying new products</td>
<td>1.72 (0.93)</td>
<td>2.25 (1.20)</td>
</tr>
<tr>
<td>Chewing a cookie vs. Trying out a new snack</td>
<td>2.49 (1.39)</td>
<td>2.86 (1.37)</td>
</tr>
<tr>
<td>Tasting cookies vs. Participating in marketing research</td>
<td>2.49 (1.52)</td>
<td>2.91 (1.51)</td>
</tr>
<tr>
<td>Composite of All Items</td>
<td>2.23 (0.87)</td>
<td>2.67 (1.16)</td>
</tr>
</tbody>
</table>

Table 1. Preference for abstract descriptions by item as a function of manipulated motivation (standard deviations appear in parentheses beside means).

Discussion
Study 1 demonstrated that people who were induced to have a stronger weight-loss drive tended to construe an upcoming cookie taste test in higher-level terms than those induced to have a weaker inclination towards weight loss. These findings provide initial evidence that anticipating self-control conflicts can and does instigate high-level construal, thereby supporting the proposition that high-level construal may serve as a means of counteractive control.

However, this is just a preliminary demonstration of the effect, and one might question whether the action identification items used to measure construal were pure indicators of this construct. For instance, the word “cookie” was present in each concrete description, so it is possible that motivated participants tended to select the abstract option not because of the hypothesized link between anticipated self-control conflicts and high-level construal, but simply to avoid the option that included the temptation word “cookie.” To address this potential concern, Study 2 was designed to replicate Study 1 in a different domain (namely that of academics). A novel conflict manipulation was also introduced to demonstrate the generality of the effect.

**Study 2**

In Study 1, the potential self-control conflict (i.e. the cookie taste test) was made salient to everyone, and the extent to which participants were motivated to exert self-control was manipulated. However, it is likely that attentional salience also plays a role in determining whether or not people engage in counteractive high-level construal. If an individual is motivated to exert self-control, but is unaware that an event or situation poses a conflict, there would be nothing to trigger high-level construal. Furthermore,
rather than manipulating goal motivation, measuring the extent to which participants are personally motivated to pursue a distal goal may provide a more natural and meaningful assessment of this construct.

Therefore, in Study 2, participants’ level of awareness of an upcoming conflict was manipulated, and their distal goal motivation (i.e. motivation to perform well academically) was measured. To this end, conflict salience was manipulated by either reminding participants of their upcoming exams and of the various temptations that threaten to undermine their preparation for these exams (high conflict salience) or not (low conflict salience). Construal was then assessed using action identification items similar to those used in Study 1, but adapted to the act of studying. It is hypothesized that, to the extent that people care about performing well academically, those for whom exams and studying-relevant temptations are made salient will be more likely to construe studying in higher-level terms. For individuals unmotivated by the distal goal of performing well academically, by contrast, the conflict salience manipulation should have no effect; as they are unlikely to experience studying as a self-control conflict, there is no impetus for counteractive high-level construal.

Method

Participants. Eighty-eight students (52 females) in an introductory psychology course at The Ohio State University took part in this study in return for course credit.

Materials and procedure. Participants completed this study at individual computer workstations, in groups of up to 12 at a time. Half of the participants (high conflict salience condition) were asked to identify any exams that they had upcoming in
the next two weeks. The study was conducted in the week prior to an introductory psychology mid-term exam to ensure all individuals had at least one item to list in response to this question. After listing their exams, these participants were then asked to list any activities, people and events that might tempt them away, or distract them, from studying for these exams. As a control, the remaining participants (low conflict salience condition) did not perform these listing tasks and simply continued to the next task.

To assess subjective construal of studying, all participants completed action identification items, similar to those used in Study 1, modeled after the Behavioral Identification Form (Vallacher & Wegner, 1989). They were presented with four paired abstract and concrete descriptions of studying. For each pair, participants were told to select the response that better captured the way that they were currently thinking about studying. Response options included: “reading chapters in my textbook” vs. “mastering course material,” “flipping through pages of my lecture notes” vs. “educating myself,” “following lines of print” vs. “gaining knowledge,” and “looking at slides from class” vs. “acquiring further understanding.” Each of these pairs was presented on a 5-point scale anchored at the concrete and abstract options, again with the prediction that participants will be drawn to the option that better fits with the abstractness of their representations, even if the options do not exactly match the contents of their mental representations.

After the assessment of subjective construal, participants completed a series of 5 questions measuring the degree to which they were motivated by academic achievement goals. These questions included: *To what extent is performing well academically an important goal for you?*, *How concerned are you about getting good grades?*, *To what
extent do you make an effort to attend class and prepare for exams?, To what extent do you avoid distractions from your schoolwork?, and how guilty would you feel if you did not prepare as much as possible for an exam or assignment?. Participants used 7-point scales with response options ranging from not at all to extremely to complete this questionnaire, after which they were debriefed and dismissed.

Results

Analysis of the five items measuring academic goal motivation indicated adequate reliability (Cronbach’s α = .72) and they were averaged to create a composite index, with higher numbers reflecting greater concern with performing well academically (M = 5.63, SD = .75). Similarly, the four action identification items (Cronbach’s α = .56) were averaged to create an index of construal level, with higher numbers indicating higher levels of construal (M = 4.27, SD = 1.07). There were no significant differences between those in the high (M = 5.59) versus low (M = 5.70) conflict salience conditions in their academic goal motivation, t (86) = .67, p = .51, r = .07, suggesting that it was acceptable to use academic motivation as a predictor variable. Action identification was regressed onto conflict salience, academic goal motivation, and the statistical interaction of these two variables, with conflict salience contrast-coded (-1 = low, 1 = high) and academic goal motivation mean-centered. As predicted, this analysis revealed a significant interaction between conflict salience and academic goal motivation (b = .32, SE = .15), p = .04 (see Figure 1).
Simple slopes analysis of this interaction indicated a pattern consistent with predictions. Among individuals motivated to perform well academically, those in the high conflict salience condition showed a tendency to construe studying through higher-level processes than those in the low conflict salience condition, \( b = .25, \text{SE} = .16 \), \( p = .13 \). More precisely, individuals high in academic goal motivation chose more abstract descriptions of studying when they were reminded of the potential conflict between their academic goals and relevant obstacles, compared to when they were not. In contrast,
among individuals relatively low in academic goal motivation, those reminded of potential conflicts showed a tendency to construe studying at lower levels than those who were not reminded of their academic conflicts ($b = -.23, SE = .16), p = .16$.

Furthermore, among individuals in the high conflict salience condition, construal levels of studying were calibrated on academic goal motivation ($b = .57, SE = .21), p = .01$. More precisely, as predicted, individuals reminded of the potential conflict between their academic goals and relevant obstacles chose more abstract descriptions of studying as their academic goal motivation increased. In contrast, academic goal motivation had no effect on subjective construal of studying for individuals who were not reminded of potential conflicts ($b = -.07, SE = .23), p = .77$.

**Discussion**

Replicating the results from Study 1 in a different domain, and with a different conflict manipulation, high-level construal of studying was more likely to be initiated in participants for whom studying constituted a self-control conflict (i.e. those high in academic goal motivation). Study 2, however, further demonstrated that this effect was specific to those for whom potential goal conflicts were made salient. Although all participants had an exam coming up within the next week, the same event (studying for that exam) prompted high-level construal only when attention was drawn to the self-control conflict. This pattern of results suggests some awareness of an upcoming self-control conflict is necessary for that conflict to trigger counteractive high-level construal.

One potential criticism of Study 2 is that participants’ motivation to perform well academically was measured after assessing their level of construal. Goal motivation was
measured after to avoid possible self-selection into the study (as being reminded of their academic goals prior to participation may have made participants more or less likely to appear for their scheduled session). It is possible, however, that participants’ construal levels impacted their reported goal motivation rather than their motivation impacting their construal levels. However, this concern may carry less weight given that consistent results were obtained when goal motivation was manipulated in Study 1. Note too that other studies indicate that manipulating construal levels appears to have no impact on the perceived value or importance of people’s goals (Fujita et al., 2006; Fujita & Roberts, 2010; Fujita & Sasota, 2011).

Replicating Study 1 in a different goal domain suggests that the observed effect is generalizable beyond food to other types of self-control conflicts. Demonstrating counteractive high-level construal in an alternate domain also helps to address a potential concern that the findings from Study 1 were driven by some confound unaccounted for in the specific items used to assess construal. The action identification items in this study appear less susceptible to the type of phrasing confound described for Study 1, and the likelihood of finding such a confound across two different domains seems low. However, to address concerns regarding the construct validity of these construal measures more directly, Study 3 will attempt to replicate the first two studies with a construal measure that does not rely on action identification. In addition, to further substantiate the role of construal level as a means for counteractive control, a different type of conflict manipulation will be used.

**Study 3**
Recent research indicates that people are capable of representing events both pictorially and linguistically, and that these two representation formats differ in level of abstraction (e.g., Amit, Algom, & Trope, 2009; Amit, Algom, Trope, & Liberman, 2009). Pictures bear physical resemblance to their referents and represent specific, concrete objects. Words, on the other hand, do not physically resemble their referents, but rather denote a class of objects. For example, whereas a picture of a car reveals the individual, unique character of the referent vehicle, the word “car” refers to a broader category. Words are thus more abstract representations than pictures. Therefore, because forming verbal representations requires higher levels of abstraction than pictorial, participants engaging in high-level construal should find it easier to think about events in words than those engaging in low-level construal. Thus, due to this match in the type of processing involved, people construing events at higher levels should be more likely to form linguistic representations of those events.

Although previous research has established that high-level construal is associated with a stronger tendency to form verbal over pictorial representations (Rim, Amit, Trope & Halbeisen, 2012), a pilot study was first conducted to replicate this finding. Study 3 then took advantage of this distinction between pictorial and linguistic representations to assess participants’ construal levels.

One could, however, find fault with this measure of construal, on the grounds that pictures have been argued to be more emotional than words (Holmes, Mathews, Mackintosh & Dalgleish, 2008). A similar concern might also be raised regarding the action identification items used in Studies 1 and 2. When anticipating a self-control
conflict, the confound of emotionality with construal level would suggest that selection of more abstract response options (Studies 1 & 2) or use of word over picture representations may simply reflect an effort to avoid a more emotionally-laden response to temptation, rather than reflecting high-level construal. Theoretically, however, counteractive high-level construal is not reducible to an effort to “cool” one’s emotional reaction to salient temptations. Initial attempts to address this concern were undertaken in the pilot study, and a secondary aim of Study 3 was to provide some empirical evidence that the observed construal level effects are independent of emotion.

The conflict manipulation used in Study 3 varied the presence of self-vs. other-control. Past research has indicated that other-control substitutes for self-control (Fishbach & Trope, 2005). Self-control conflicts become irrelevant when others are in place to enact control, as people feel little pressure to protect their goals from situational threats. If high-level construal serves as a form of counteractive control, it should be less evident among people in the other-control (vs. self-control) condition, as there is no relevant self-control conflict to initiate the process.

**Pilot Study**

In this study, 48 participants were induced to represent "studying for an exam" via high-level vs. low-level construal using a well-established construal level manipulation (Freitas et al., 2004). As noted earlier, this procedure reliably induces high-level vs. low-level construal by having participants generate either the superordinate (high-level) ends achieved by a particular action or the subordinate (low-level) means with which to achieve that behavior. Accordingly, whereas those in the high-level condition of this
pilot study generated the ends achieved by studying for an exam, those in the low-level condition generated means by which one studies for an exam. Then, after taking a moment to think about studying for an exam, they reported the extent to which those thoughts took the form of pictures versus words. Specifically, they were asked: *As you were thinking about studying for an exam, to what extent did your thoughts take the form of pictures or words?,* with response options ranging from 1 (completely pictures) to 7 (completely words). Results revealed, as predicted, that participants prompted to represent studying via high-level construal ($M = 3.92, SD = 1.58$) were more likely to report thinking about studying in terms of words (vs. pictures) than those induced to construe studying at lower levels ($M = 2.95, SD = 1.50$), $t(44) = 2.11, p = .04$. Thus, high- and low-level construal do appear to be systematically associated with linguistic vs. pictorial representations, respectively.

To address the possibility that linguistic versus pictorial representations reflect differences in the emotionality rather than the level of participants’ construal, in the same pilot study, participants reported how emotional it was for them to think about studying for an exam, and also completed the Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988). Neither perceived emotionality nor the positive or negative subscales of the PANAS, nor any individual items of the PANAS showed any significant differences as a function of construal (all $t$’s < 1.7), suggesting that perceived emotionality cannot account for the effect of construal level on the tendency to think in terms of words vs. pictures. These pilot data suggested that high-level construal enhances the tendency to form word vs. picture representations, and provided further
evidence that these effects are independent of emotion. Therefore, these findings supported the use of pictorial vs. linguistic representation to measure construal level processes in Study 3.

**Method**

**Participants.** One hundred and eight students (58 females) in an introductory psychology course at The Ohio State University took part in this study in return for course credit.

**Materials and Procedure.** Students completed the study in a small classroom in groups of up to 10. Upon their arrival, participants were seated at individual desks. As in Study 1, participants were led to believe that they would be taking part in a marketing research cookie taste test, with a description identical to that used in Study 1. To support this cover story, a bowl of chocolate chip cookies was prominently displayed on a table visible to all participants. Half of the participants were randomly assigned to the self-control condition, in which they were told that the number of cookies that they ate would be entirely up to them. The other half of the participants were assigned to the other-control condition, in which they were told that the experimenter would limit the number of cookies that they could eat to a small number.

Participants were next asked to think about the impending cookie taste test for a few minutes, after which they reported to what extent they had thought about this taste test in terms of pictures vs. words. Specifically, using response scales that ranged from 1 (not at all) to 9 (very much), participants answered the following questions: “How much did you find yourself thinking in mental images (i.e., in mental pictures and sensory
impressions)?” and “How much did you find yourself thinking in words or sentences (i.e., in verbal thoughts)?”

Although the pilot data suggested that word vs. picture representations are not confounded with emotionality, in an attempt to address this potential confound in the current study, participants next assessed how emotional they found the cookie taste test to be (not at all emotional to extremely emotional) and reported their current mood (very negative to very positive), using similar 9-point scales. Finally, participants were debriefed, offered a cookie, and dismissed.

Results

Participants’ ratings of their thoughts about the impending cookie taste test were subjected to a 2 (control type: self- vs. other-control) x 2 (thought type: picture vs. word) mixed-design ANOVA with the former as a between-subjects factor and the latter as a within-subjects factor. Although there was no significant effect of condition, there was a significant effect of thought type, $F(1, 106) = 150.30, p < .001, r = .77$. In general, participants reported thinking more in terms of pictures ($M = 6.68, SD = 1.61$) than words ($M = 3.47, SD = 2.10$). This was qualified, however, by the predicted interaction between condition and thought type, $F(1, 106) = 3.86, p = .05, r = .19$ (see Figure 2). Those in the self-control condition, relative to those in the other-control condition, reported thinking less in terms of pictures ($M_s = 6.43$ vs. $6.89$, $SD_s = 1.86$ vs. 1.32, respectively) and more in terms of words ($M_s = 3.76$ vs. 3.21, $SD_s = 2.16$ vs. 2.02, respectively).
Figure 2. Degree to which participants reported picture vs. word representations as a function of experimentally manipulated goal motivation.

To demonstrate the independence of these effects from emotionality, independent-samples t-tests first compared participants’ ratings of how emotional the impending event was and how positive their current mood was as a function of self- vs. other-control condition. As expected, there were no significant differences for either emotionality, $t(106) = 1.11, p = .27, r = .11$, or for mood, $t(106) = .64, p = .52, r = .06$. Moreover, the
primary pattern of results remained the same after statistically adjusting for emotionality and mood independently as covariates.

Discussion

Study 3 replicated the previous findings using a different conflict manipulation and a different measure of construal level. As predicted, people anticipating a personally relevant self-control conflict were more likely to construe that event abstractly than were those facing a parallel situation in which their behavior was controlled by others, and thus did not present a relevant self-control conflict. Despite the typical tendency to construe proximal events concretely, these findings provide additional evidence for a counteractive mechanism that promotes high-level construal of proximal self-control conflicts.

In this study, participants generally reported construing the taste test in terms of pictures, an unsurprising finding given that a bowl of cookies was presented at the outset of the laboratory session. This initial visual presentation may have led participants to generate a visual rather than linguistic mental representation of the cookies prior to any experimental manipulation. More important for the present purpose, this tendency was significantly reduced when participants anticipated a self-control conflict compared to when they could rely on others for control. These results help to counter any potential confounds arising from the action identification items used in the first two studies because they were obtained using a different type of construal level measure.

Study 3 also addresses a possible interpretation of the findings to this point as reflecting differences in the emotionality rather than level of participants’ construal
processes. Despite finding the anticipated construal level differences, there were no differences in the emotionality participants associated with the imminent taste test. These results thus provide some empirical support for the conceptual independence of construal level and emotionality.

However, all of the studies to this point have relied on the potentially questionable premise that people are able to accurately report on their level of construal. Although there is reason to believe that these measures do usefully reflect the processes of interest, such claims would be bolstered if the same results were obtained with a behavioral/performance-based measure of construal. Study 4, therefore, employed a more indirect measure of construal.

In addition, counteractive control is expected only to the extent that a temptation threatens to undermine a valued goal, and only desirable temptations can provide such a goal threat. Therefore counteractive high-level construal should be evident only to the extent that the situation poses a self-control conflict. In Study 4, this is operationalized by presenting participants with a taste test scenario, and measuring both the extent to which they view the temptation as desirable and the extent to which they value the threatened goal.

Finally, Study 4 provided an initial attempt to assess the role of counteractive high-level construal in promoting self-control behavior.

**Study 4**

Behavioral segmentation has been used in previous research to indicate participants’ level of construal (e.g. Wakslak, Trope, Liberman & Alony, 2006;
Henderson et al., 2006). In completing this task, individuals watch a video of someone performing a series of behaviors, and indicate each time they believe a meaningful action has occurred (Newtson, 1973). In segmenting such videos, the detail-oriented focus of the low-level construal process should lead people to view more actions as meaningful than the goal-directed abstraction process associated with high-level construal. Therefore, those construing a video at higher-levels should divide it into fewer, broader behavioral segments. Although previous research has established that high-level construal is associated with behavioral segmentation into fewer broader units (Wakslak et al., 2006; Henderson et al., 2006), a pilot study was first conducted to demonstrate this association with the specific video used in the present research. Study 4 then used this type of measure as a more indirect, performance-based means of assessing participants’ construal levels.

In this study, the degree to which participants experienced a self-control conflict was measured by assessing the extent to which they valued both the temptation and the conflicting goal. If high-level construal is engaged counteractively to protect valued goals, it should be more likely as goal value increases, but only to the extent that people view the temptation as desirable. If the temptation is not valued, then no self-control conflict exists.

Furthermore, in an effort to extend the previous findings, this study also allowed participants to actually encounter the anticipated self-control conflict and included an assessment of self-control behavior.

**Pilot Study**
In this study, 53 participants were led to anticipate taking part in an M&M taste test before being induced to adopt high-level vs. low-level construal using a well-established construal level manipulation (Fujita et al., 2006). As noted earlier, this procedure reliably induces high-level vs. low-level construal by having participants generate either superordinate (high-level) category labels for a given set of objects or subordinate (low-level) exemplars for those same objects. After the construal manipulation, participants completed a behavioral segmentation task. In this task, participants watched a 4-minute video of someone taking part in a taste test similar to the one they were about to complete. The video consisted of a female undergraduate student eating M&Ms and completing a questionnaire, and participants were asked to keep a tally of each time the individual in the video performed a meaningful action. The results revealed that participants prompted to adopt high-level construal ($M = 8.61, SD = 5.66$) showed a non-significant tendency to divide the video into fewer, broader meaningful actions, than those induced to construe at lower levels ($M = 10.96, SD = 7.32$), $t(53) = 1.34, p = .19$. Although the trends are not significant, these data are consistent with previous findings in suggesting that high-level construal promotes behavioral segmentation into fewer, broader units than low-level construal. As a result, this behavioral segmentation measure was used in Study 4 to assess participants’ levels of construal.

**Method**

**Participants.** Ninety-one students (41 females) in an introductory psychology course at The Ohio State University took part in this study in return for course credit.
Materials and procedure. Students completed the study in a laboratory setting in groups of up to 4 at a time. Upon their arrival, participants were seated at individual workstations with both a paper packet and a computer. They were led to believe that they would be taking part in a test of their ability to distinguish M&M colors based on taste. To support this cover story, three bowls of M&Ms, sorted by color, were present at each workstation. Before beginning the taste test, participants were asked to take a moment to think about what the upcoming taste test would be like. Then, to assess their level of construal, they completed a behavioral segmentation task. In this task, participants watched the same 4-minute video of a female undergraduate student eating M&Ms and completing a questionnaire that was used in the pilot study. As was the case in the pilot study, participants were asked to keep a tally of each time the individual in the video performed a meaningful action.

After the behavioral segmentation task, participants were allowed to begin tasting the M&Ms, ostensibly to practice distinguishing the three M&M colors in front of them based on taste. They then reported their evaluation of M&Ms, “How would you evaluate the taste of M&Ms generally?”, with response options ranging from 1 (extremely negative) to 7 (extremely positive). Next, to assess participants’ weight-loss motivation they were asked the following question: “To reach your ideal weight, which of the following would you need to do?” with response options including lose weight, gain weight, and neither (I am at my ideal weight). Participants then completed a series of demographic questions (including age, and gender) before being debriefed and dismissed.
from the study. Finally, after the participants left, the remaining M&Ms at each workstation were weighed to assess how much each individual had eaten.

**Results**

Participants’ motivation to lose weight was indexed by comparing those who reported needing to lose weight with those relatively unconcerned with weight loss (including participants already at their ideal weight and those who wanted to gain weight). In addition, because responses to the behavioral segmentation measure were positively skewed, this variable was log-transformed before being analyzed. Participants’ responses to the behavioral segmentation measure were then regressed onto weight-loss motivation, evaluation of M&Ms, and the statistical interaction of these two variables. In this and all subsequent analyses, weight-loss motivation was contrast coded (-1 = low, 1 = high) and M&M evaluation was mean-centered. This analysis revealed a marginal main effect of M&M evaluation, such that individuals who evaluated M&Ms more positively tended to divide the video into fewer segments ($b = -.20, SE = .10), p = .06$. An additional main effect of participants’ weight-loss motivation indicated that people who were more motivated to lose weight tended divide the video into fewer segments ($b = -.82, SE = .38), p = .03$. However, as predicted, these effects were qualified by a significant interaction between weight-loss motivation and M&M evaluation ($b = .15, SE = .06), p = .02$ (see Figure 3).

Simple slopes analysis of this interaction indicated that, among individuals who evaluated the taste of M&Ms more positively, those motivated to lose weight divided the video into fewer, broader segments than those who were not ($b = .21, SE = .09), p = .03$. 

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In contrast, weight-loss motivation had no effect on behavioral segmentation for individuals who evaluated the taste of M&Ms relatively negatively ($b = -.10, SE = .09), p = .27. As predicted, these results suggest that counteractive high-level construal was evident only among individuals who experienced the taste test as a goal threat (i.e. those who valued the goal and viewed the temptation as desirable).

In addition, the same individuals who experienced the taste test as a goal threat were expected to display better self-control by eating fewer M&Ms, and their construal of the taste test was predicted to mediate this effect. To test these possibilities, participants’ M&M consumption was first regressed onto weight-loss motivation, evaluation of M&Ms, and the statistical interaction of these two variables, to assess the direct effect of experienced goal threat (i.e. the interaction between weight-loss motivation and M&M evaluation) on self-control. Surprisingly, this analysis revealed no significant effect of the interaction between M&M evaluation and weight-loss motivation on M&M consumption ($b = -1.10, SE = 1.69), p = .55. Finally, bias-corrected boot-strapping procedures ($N = 10000$) were conducted as recommended by Preacher and Hayes (2008; see also: Shrout & Bolger, 2002), examining the indirect effect of the interaction between M&M evaluation and weight-loss motivation on M&M consumption through behavioral segmentation. This analysis revealed the predicted effect of the interaction between M&M evaluation and weight-loss motivation predicting behavioral segmentation ($b = .16, SE = .07), p = .02, with the same pattern described earlier. A marginal main effect of M&M evaluation on M&M consumption ($b = -1.58, SE = .86, p = .07) was also uncovered, indicating that participants who evaluated M&Ms more positively tended to
eat more of them. However, inconsistent with predictions, participants’ responses to the behavioral segmentation measure did not significantly predict their M&M consumption after controlling for the interaction between M&M evaluation and weight-loss motivation ($b = 1.58$, $SE = 2.83$), $p = .58$. Furthermore, the 95% confidence interval for the indirect path through behavioral segmentation did include zero (-.49 to 2.09), indicating a non-significant indirect effect of the interaction between M&M evaluation and weight-loss motivation on M&M consumption through high-level construal. These findings suggest, unexpectedly, that participants’ spontaneous construal of the conflict situation had no significant impact on their self-control behavior.
Discussion

The results of Study 4 provide initial evidence suggesting that among individuals tempted by M&Ms, those motivated to lose weight processed information related to an impending taste test through higher-level construal than those who were not motivated to lose weight. Specifically, only individuals who enjoy M&Ms should theoretically be tempted into low-level construal by the M&M taste test, and only those who also value weight loss would be expected to engage in counteractive high-level construal. No
theoretical predictions can be made for individuals who do not enjoy M&Ms, as they will not experience the taste test as a self-control conflict.

However, these results are still quite preliminary. Unlike the previous studies, these findings are entirely correlational, leaving open the possibility that participants’ construal may have influenced their evaluations of M&Ms and/or their reported weight-loss goals, or that a confounding variable could account for these effects. Without an experimental design in which goal threat is manipulated, the causal nature these effects cannot be definitively established. Furthermore, in this study, participants’ construal levels were not significantly related to the amount of M&Ms eaten. This finding is surprising, as counteractive high-level construal is expected enhance self-control. However, there are several problems associated with assessing self-control behavior in a laboratory session that may help to account for this finding. For instance, participants may have felt uncomfortable eating either because so many others were present, or because they felt as though they were being evaluated. It is also possible that the task demands to eat (with the goal of distinguishing M&M colors based on taste) left little room for individual level variability. In future studies, greater care will need to be taken to minimize the external restrictions on eating behavior that participants might experience.

However, with these caveats in mind, the present finding is consistent with the idea that high-level construal can be engaged counteractively in anticipation of self-control conflicts. Furthermore, in providing evidence for spontaneous high-level construal on a distinct, more indirect, behavioral measure, these results help to undermine
the argument that findings from the previous three studies were driven by demand effects or by other confounds with the specific self-report items used.

The four studies described thus far demonstrate that people do have mechanisms that allow them to engage in high-level construal of imminent self-control conflicts, but does this really matter? Although a great deal of evidence has established that experimentally inducing high-level construal promotes self-control success, to date, there is no evidence that more spontaneous counteractive high-level construal of impending self-control conflicts has similar benefits. As noted above, Study 4 included an initial attempt to assess the effects of spontaneous construal levels on self-control behavior, but did not find any evidence that engaging in counteractive high-level construal conferred a self-control advantage. Limitations in the design and/or implementation of Study 4 may help to account for this unexpected finding, so Study 5 attempted to measure self-control behavior in a different domain, and using a more naturalistic assessment technique.

**Study 5**

This study used a similar methodology to that of Study 2. Once again, participants were recruited prior to an exam and reported their academic goal motivation. This time, however, potential self-control conflicts were made salient to all participants before they reported their construals of studying. Finally, performance on the final exam was used to assess the relationship between spontaneous high-level construal at the prospect of a self-control conflict and self-control success. It was hypothesized that thinking about studying for an upcoming exam should be more likely to trigger high-level construal among individuals motivated to perform well academically, replicating the
previous four studies. However, moving beyond the previous studies, this counteractive high-level construal should also promote overcoming temptations to studying, as assessed by enhanced test performance.

**Method**

**Participants.** Forty-nine students (35 female) in 3 sections of an introductory social psychology course took part in this study in return for $5.

**Materials and procedure.** Participants completed the study over the Internet up to 5 days prior to their final exam in an introductory social psychology class. Participants first listed their upcoming exams and any factors that might interfere with their studying for these exams, in the same manner as in Study 2. This ensured that all participants thought about their social psychology exam, and that any self-control conflict associated with studying for this exam was made salient for everyone.

Next, participants were asked to take a moment to think about studying for their social psychology exam. Then, as in Study 3, participants’ construal of studying was measured by having them report the extent to which these thoughts took the form of pictures or words, this time on a bipolar 7-point scale (1 = pictures, 7 = words). Next, to assess how affective or emotional participants’ thoughts about studying were, they were also asked how emotional it was for them to think about studying for their exam (*not at all* "emotional to extremely emotional") and how worried they were about this exam (*not at all* "worried to extremely worried") using 7-point scales.

After reporting their construal of studying, participants completed two academic motivation questions ("To what extent is performing well academically an important goal")
for you,” and “How concerned are you about getting good grades?”), using 7-point scales with end points ranging from not at all to extremely. Participants then completed demographic questions (e.g. age, gender), and reported the extent to which they had “goofed off” during the study, using a 7-point scale ranging from not at all to a lot. Finally, participants were paid and dismissed. To assess self-control success, with participants’ permission, grades on both the course midterms and the final exam were obtained from the instructors.

**Results**

The two items assessing academic goal motivation were averaged to create an aggregate index (Cronbach’s α = .91), with higher numbers reflecting greater concern with performing well academically. In addition, to assess the extent to which participants successfully exerted self-control in studying for their final exam, a grade-improvement index was calculated by subtracting each participant’s mean percentage score on the two class midterms from his or her percentage score on the final exam, with higher values indicating greater improvement from the midterms to the final exam. A larger grade improvement suggests greater self-control success in studying for the final exam.

Although participants were recruited from three separate sections of a social psychology course, there was no effect of section on whether thoughts took the form of words vs. pictures, $F (2, 39) = .51, p = .61, r = .11$, nor on grade improvement, $F (2, 39) = 1.66, p = .20, r = .20$, and statistically controlling for section did not alter the pattern of results. Therefore, to preserve degrees of freedom, the section variable was not included in the final models. Furthermore, although gender had no effect on grade improvement,
As such, all subsequent analyses statistically adjusted for the effect of gender. In addition, 9 participants who reported having “goofed off” during the study were removed from all analyses. Although removing these individuals strengthened the observed effects, the pattern of results was unchanged when the same analyses were conducted on the complete sample.

The high-level construal evidenced by people anticipating a self-control conflict was expected to predict improvement in performance between the midterms and the final exam. To test this, bias-corrected boot-strapping procedures (N = 10000) were conducted as recommended by Preacher and Hayes (2008; see also: Shrout & Bolger, 2002), examining the indirect effect of academic goal motivation on grade improvement through the use of word over picture representations (controlling for gender). Gender was effects-coded (female = -1, male = 1), whereas goal motivation and use of word over picture representations were mean-centered (see Figure 4).

After statistically adjusting for the effect of gender, higher levels of motivation predicted greater use of word over picture representations when thinking about studying, replicating Study 3, b = .56, SE = .28, t (39) = 1.98, p = .05. As predicted, high-level construal, in turn, predicted greater grade improvement, b = .02, SE = .01, t (38) = 2.39, p = .02, after controlling for the effect of academic goal motivation on grade improvement, b = -.04, SE = .01, t (38) = -3.15, p = .003. Furthermore, the 95% confidence interval for the indirect path through word over picture representation, as predicted, did not include zero (.0009 to .03), indicating a significant indirect effect of goal motivation on grade improvement.
improvement through high-level construal. This suggests that people’s spontaneous
counteractive high-level construal of self-control conflicts does indeed promote
successful self-control behavior. Heightened motivation appears to increase the
likelihood of high-level construal, which in turn appears to promote performance
(presumably through more effective self-control when studying). Overall, greater
academic goal motivation generally led to reduced grade improvement, $b = -0.03$, $SE = \ldots$, $t(39) = -2.41$, $p = .02$. This finding, however, does not undermine the validity of
interpreting the indirect effect. Instead, it suggests that there may have also been other
effects of motivation on processes that impair performance that were not assessed in the
present study (Hayes, 2009; MacKinnon, Krull, & Lockwood, 2000). This issue is
further addressed in the Discussion that follows.

**Examining the role of emotionality.** To demonstrate the independence of these
effects from emotionality, the two items assessing participants’ emotional reactions to
thoughts about studying were averaged to create an aggregate index (Cronbach’s $\alpha = .75$)
with higher numbers reflecting stronger emotional reactions. This index was then
correlated with the goal motivation index ($r = -0.03$, $p = .88$), and the construal measure ($r = .05$, $p = .74$). As anticipated, neither of these correlations reached statistical
significance, and controlling for emotionality in the primary analyses yielded the same
pattern of results.
Discussion

These results expand on findings from the previous four studies by providing preliminary evidence that spontaneous high-level construal of impending self-control conflicts can promote successful self-control behavior. Not only does the prospect of facing a self-control conflict prompt high-level construal, but this counteractive construal process appears to be functional as it aids people in successfully overcoming that self-control conflict. Furthermore, Study 5 provided additional evidence for the independence between high-level construal and emotionality.

Figure 4. Positive indirect effect of academic goal motivation on grade improvement through construal level.

\[
\text{Construal level} \quad B = 0.56 \ (SE = 0.28) \ *
\]

\[
\text{Academic goal motivation} \quad B = 0.02 \ (SE = 0.007) \ *
\]

\[
\text{Grade improvement} \quad B = -0.03 \ (SE = 0.01) \ *
\]

\[
[B = -0.04 \ (SE = 0.01) **]
\]

\* = \( p \leq 0.05 \)

\** = \( p \leq 0.01 \)

95% CI for indirect effect = 0.0008 - 0.03
One unexpected finding was that, in general, increasing goal motivation led to smaller grade improvements from midterms to final exam. This should not, however, be interpreted as undercutting the conclusions that counteractive high-level construal promotes self-control. As noted above, increasing goal motivation promoted the use of word over picture representations of studying, which in turn predicted greater grade improvement. There may, however, be multiple effects of goal motivation on grade improvement that were unmeasured in the current study. For example, those who were highly motivated may have already been performing at their highest possible level, leaving little room for additional improvement from midterm to final exam. Enhanced goal motivation may also promote “choking” while completing the final exam itself; i.e., over-motivation that leads to underperformance. Statistically, if these possible negative pathways for academic goal motivation to affect students’ grades are larger in effect size than the effect of counteractive high-level construal, a negative impact of academic goal motivation on grade improvement is not only plausible, but highly likely (Hayes, 2009; MacKinnon et al., 2000). Thus, that there was a negative relationship between academic goal motivation and grade improvement does not undermine the conclusion that high-level construal of anticipated self-control conflicts promotes successful self-control behavior.

Taken together, these five initial studies support the hypothesis that people are able to spontaneously use high-level construal in service of self-control. Study 5, in particular, suggests that not everyone spontaneously engages in high-level construal at the prospect of temptation, and that the absence of counteractive high-level construal may
lead to poorer self-control. These results point to a potential target for intervention, suggesting that measuring counteractive high-level construal may be one way to identify people likely to fail at self-control. In addition, to the extent that failure to engage counteractive high-level construal undermines self-control, teaching people to use this strategy may improve their self-control efforts. In Study 5, even among individuals motivated to perform well academically, only those who displayed spontaneous high-level construal of the conflict situation were able to overcome temptation to align their performance with this valued goal. The next studies will attempt to provide initial steps toward such intervention strategies.

There are at least two possible explanations for the observed individual differences in spontaneous high-level construal. It may be that people are not aware (either implicitly or explicitly) that high-level construal promotes self-control. Alternatively, people may recognize that high-level construal would benefit their self-control efforts, but lack the ability to engage the appropriate construal processes in critical moments (i.e., at the prospect of temptation). This suggests two unexplored sources of deficient self-control (i.e., lack of knowledge or lack of ability with respect to counteractive high-level construal). Studies 6 and 7 are designed as initial attempts to assess the first of these possibilities, namely that people may differ in their knowledge that high-level construal promotes self-control.

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Chapter 3: Lay Theories of Counteractive High-level Construal

Study 6

Study 6 was designed to provide preliminary evidence for the hypothesis that people understand at some level, either implicitly or explicitly, that high-level construal promotes global goals in the face of opposing local temptations. Participants were asked to imagine being presented with cookies, a situation that provides a strong local demand to eat (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Polivy, Herman, & McFarlane, 1994). Half were asked to imagine having an eating restraint goal in this situation, whereas the other half were asked to imagine having an eating enjoyment goal. As a measure of construal, participants then were presented with abstract and concrete descriptions of the taste test and asked to report which of the two descriptions would best serve their respective goals. As eating cookies represents a threat to eating restraint goals, participants who imagined having a restraint goal were expected to prefer more abstract descriptions of the cookie-eating event than those who imagined having an enjoyment goal.

Method

Participants. One hundred and nineteen introductory psychology students (48 females) at The Ohio State University took part in this study in return for course credit.
**Materials and procedure.** Students completed the study in a small classroom in groups of up to 10. Upon their arrival, participants were seated at individual desks. Participants were first asked to imagine taking part in a marketing research cookie taste test in which they would eat at least one cookie, but the total number eaten would be up to them. They were told to imagine that although the cookies being tested were designed to maximize taste, they were also extremely unhealthy, with 370 calories and 15 grams of fat each. Participants were then randomly assigned to one of two hypothetical goal conditions. Half of the participants were told to imagine being worried about eating too many cookies during the taste test (restraint goal), whereas the other half were told to imagine being concerned about maximizing enjoyment during the taste test (enjoyment goal).

Participants then completed a measure of action identification similar to that used in Study 1, based on the Behavioral Identification Form (Vallacher & Wegner, 1989). They were presented with three paired abstract and concrete descriptions of the taste test they had just imagined. For each pair, participants were told to select the way of thinking about the taste test that would best serve their assigned goal (restraint vs. enjoyment). Response options were comprised of: “eating cookies” vs. “trying new products,” “chewing a cookie” vs. “trying out a new snack,” and “tasting cookies” vs. “participating in marketing research.” Each of these pairs was presented on a 5-point scale ranging from the concrete option to the abstract option. After completing this questionnaire, participants were debriefed and dismissed.

**Results**
Analysis of the three action identification items indicated adequate reliability (Cronbach’s \( \alpha = .72 \)). These items were averaged to create an index of construal level, with higher numbers indicating higher levels of construal (\( M = 2.71, SD = 1.05 \)). An independent samples \( t \)-test revealed that participants assigned to the restraint goal condition identified abstract descriptions as more preferable (\( M = 3.06 \)) than did those in the enjoyment goal condition (\( M = 2.36 \)), \( t (117) = 3.86, p < .001, r = .34 \).

Discussion

Results from Study 6 indicate that people associate high-level construal with the promotion of global goals in the face of contrasting local desires. When participants imagined a situation posing a food-related self-control conflict, they understood that high-level construal would be more beneficial than low-level for promoting dieting restraint. These results suggest that people are aware at some level, either implicitly or explicitly, that cognitive abstraction can serve to overcome conflicting temptations to promote their more distal goals. This provides preliminary evidence for the possibility that people can recognize the benefits of high-level construal for self-control. However, if this knowledge is actually advantageous for self-control, then it should distinguish those who are successful from those who are not. Therefore, Study 7 was designed to assess whether successful dieters were more likely than unsuccessful dieters to recognize that high-level construal would promote self-control.

Study 7

To assess whether knowing the self-control benefits of high-level construal differentiates those who are successful at self-control from those who are not,
participants’ levels of dieting success were assessed prior to a laboratory session. In this subsequent laboratory session, similar to Study 6, participants imagined taking part in a taste test with either a restraint or an enjoyment goal, and were asked whether abstract or concrete descriptions of the taste test would better serve their assigned goals. It was hypothesized that successful dieters would be more likely than those who are unsuccessful to realize that high-level construal would serve a restraint goal.

**Method**

**Participants.** Sixty-two introductory psychology students (23 males) took part in this study, in return for partial course credit.

**Materials and procedure.** At least 24 hours before coming into the lab, all participants completed an online survey assessing their level of dieting success. These questions were presented on 7-point Likert scales anchored at *not at all* (1) and *extremely* (7), and included the following items: *How successful are you at watching your weight?*; *How successful are you at losing extra weight? How difficult do you find it to stay in shape?* (reverse scored); *How successful have you been at maintaining your preferred weight?*

In the subsequent laboratory session, all participants were asked to imagine taking part in a brownie taste test in which they could eat as many brownies as they liked. They were told to imagine that although the brownies being tested were delicious, they were also extremely unhealthy, with 450 calories and 27 grams of fat each. In the next portion of the taste test scenario, participants were randomly assigned to one of two hypothetical goal conditions, similar to those used in Study 6. Half of the participants were told to
imagine being worried about eating too many brownies during the taste test (restraint goal), whereas the other half were told to imagine being concerned about maximizing enjoyment during the taste test (enjoyment goal).

After they had imagined the scenario, participants reported, using a 7-point Likert scale, whether they believed thinking about the upcoming taste test in pictures or words would better serve their assigned goal. Next, participants reported the degree to which they enjoyed eating brownies using a 7-point scale ranging from not at all (1) to extremely (7). After answering these questions, participants were debriefed and dismissed.

**Results**

Scale reliability analyses of the four pre-measured dieting success items indicated adequate reliability (Cronbach’s α = .63). As a result, these items were averaged to create a scale score, with higher numbers representing higher levels of success ($M = 4.45$, $SD = 1.14$). Eight participants who reported distaste for brownies (i.e. responses of 2 or lower on a 7-point scale) were removed from all analyses, as minimizing brownie consumption would not pose a self-control conflict for them.4

A linear regression analysis was performed using participants’ dieting success, their hypothetical goal condition, and the interaction between these variables to predict the degree to which participants believed thinking in words vs. pictures would better serve their assigned goal (see Figure 5). This analysis revealed a main effect of hypothetical goal condition, indicating that participants given a hypothetical restraint goal were more likely than those in the enjoyment goal condition to report that high-level
construal would serve their goal, \(b = 1.16, SE = .25, p < .01\). In addition, a main effect of dieting success was observed, such that more successful dieters were more likely to suggest that high-level construal would serve their assigned goal \(b = .53, SE = .24, p = .03\). However, as predicted, these main effects were qualified by a significant interaction between dieting success and hypothetical goal condition, \(b = .64, SE = .24, p = .01\).

Simple slopes analyses of this interaction indicated that successful dieters assigned to the restraint goal condition were more likely than unsuccessful dieters to recognize that high-level construal of the taste test would better serve their goal \(b = 1.17, SE = .50, p = .03\). Among individuals assigned to the enjoyment goal condition, successful and unsuccessful dieters did not differ in their selection of word over picture representations with everyone more likely to select pictures \(b = -.10, SE = .21, p = .62\). No construal level effects were expected in this condition, as the brownie taste test would not conflict with an enjoyment goal.
Figure 5. Interaction between pre-measured dieting success and hypothetical goal manipulation (enjoyment vs. restraint) predicting participants’ preference for word over picture representations.

**Discussion**

In Study 7, successful dieters were more likely than unsuccessful dieters to understand that high-level construal would promote a restraint goal during a brownie taste test. However, participants’ level dieting success had no effect on construal responses among those assigned to the enjoyment goal condition. Therefore, when participants were led to anticipate a situation that would pose a self-control conflict (i.e. taking part in a brownie taste test with a restraint goal), successful dieters were more
likely than unsuccessful dieters to understand that high-level construal would promote
self-control, and these differences were limited to situations relevant to self-control.
These results suggest that successful dieters may possess knowledge that unsuccessful
dieters lack regarding the usefulness of high-level construal in resolving self-control
dilemmas. Assessing this knowledge may therefore provide a novel means of
distinguishing successful from unsuccessful dieters. These lay theories about the effects
of high-level construal on self-control may thus reveal a specific deficiency that can be
targeted for intervention.
Chapter 4: General Discussion

A construal level approach suggests that people fail at self-control because proximal temptations trigger low-level construal. CLT leaves unspecified how people are ever able to overcome proximal temptations in favor of their more distal goals. In hopes of clarifying this issue, the present research drew on counteractive control theory (Trope & Fishbach, 2005). Specifically, the current studies proposed the existence of mechanisms capable of overriding the tendency for immediate temptations to promote low-level construal by counteractively prompting high-level construal instead, thereby facilitating self-control. Five studies provided preliminary evidence of high-level construal as a cognitively-based means of counteractive control. People engaged in counteractive high-level construal to the extent that they were motivated (Studies 1, 2, 4 and 5), perceived a threat to their goals (Studies 2 & 4), and had no alternative forms of control available (Study 3). Engaging in counteractive high-level construal, moreover, was functional in that it enhanced self-control behavior (Study 5). These five studies provide initial support for the idea that people can, at the prospect of temptation, counteractively engage in high-level construal, bolstering their self-control efforts. Two additional studies began to explore the role that understanding the benefits of high-level construal may have in promoting self-control success. These studies revealed not only that people are able to recognize the utility of high-level construal for self-control
(Studies 6 & 7), but that this capacity is more pronounced among those who are successful at self-control (Study 7). Collectively, these findings suggest that discrepancies in the knowledge that engaging in high-level construal promotes self-control may help to explain why some people are able to successfully overcome the lure to low-level construal posed by proximal temptations.

**Open questions and next steps**

The current studies provide some initial support for the existence of counteractive high-level construal and for the idea that people possess lay theories about the usefulness of high-level construal in self-control contexts. However, there are still a few open questions that suggest ways these findings can be bolstered and extended to allow for more definitive claims.

**Measuring construal level indirectly.** One limitation of the current studies is their heavy reliance on self-report measures of construal level. These measures require the debatable assumption that people have the ability to accurately report on the relevant contents of their minds and past experiences. They also leave open the possibility that either demand effects or confounds (e.g. emotionality) in the specific items used could account for any observed results. In many cases, attempts were made to address these concerns in the current studies, but such issues can never be ruled out entirely without changing the way construal level processes are assessed. Thus, although these measures of construal have been validated and successfully used in past work in the construal level theory literature (e.g., Liberman & Trope, 2008; Trope & Liberman, 2003; 2010), the utility and eventual contribution of the present findings may depend on the development
of measures that bypass the need for introspective access, and instead assess construal level processes more indirectly.

Study 4 offered an important first step toward this goal, as behavioral segmentation provides a more indirect construal measure that seems less susceptible to these types of confounds or demand effects. However, due to the correlational design, the results were still open to multiple interpretations. Therefore, it would be helpful to run additional experiments in which the presence of a self-control conflict is manipulated before behavioral segmentation is assessed. For instance, using a similar taste test paradigm to that in Study 4, one way to manipulate the presence or absence of a conflict might involve having half of the participants complete the construal measure after the taste test (no conflict condition) while the other half complete the construal measure before the taste test (conflict condition). After they have already completed the taste test, participants have no self-control conflict to offset, so there is no reason to engage in counteractive high-level construal. Therefore, those who complete the construal measure first would be expected to display higher-level construal processes than those who complete the taste test first. Such a finding would provide experimental evidence for counteractive high-level construal on an indirect measure.

**Assessing self-control behavior.** The present set of studies also provides mixed support for the utility of counteractive high-level construal in promoting self-control behavior. However, if these construal processes are to eventually prove useful for diagnosis and intervention strategies related to self-control success, clear behavioral evidence is necessary. Although unexpected, the M&M consumption results from Study
4 may be useful in helping to illustrate some of the difficulties with measuring self-control behavior in a laboratory setting. For instance, in a dieting study, people know they are being observed, often by both the experimenter and their fellow participants, creating a strong situational demand to eat very little. In addition, Study 4 did not include measures to control for participants’ level of hunger, or the healthiness of their recent food choices, both factors that may influence their eating behavior. Any future dieting studies will need to take these various factors into account in order to design a paradigm that allows participants to feel comfortable eating whatever they want while providing maximal privacy and anonymity.

Conversely, in the academic domain, Study 5 provided preliminary behavioral evidence that counteractive high-level construal may promote successful self-control. However, this study did not include a “no-conflict” control condition. This raises the possibility that people who value performing well academically may construe studying through higher-level processes even when no conflict is imminent, a finding that would undermine the claim that the spontaneous construal process is counteractive. As a result, an experiment in which manipulating the presence or absence of a self-control conflict influences self-control behavior through counteractive high-level construal would strengthen this package of studies. Such a study might rely on a conflict manipulation similar to that used in Study 1, in which participants anticipating a taste test would be made to feel as if they have either very little weight to lose (low weight-loss motivation) or a lot of weight to lose (high weight-loss motivation). They would then report their construal of an upcoming taste test before actually completing it. Those induced to have
higher weight-loss motivation would be expected to construe the taste test through higher-level processes and, in turn, to eat less than those induced to have a lower motivation to lose weight.

**Linking lay theories to counteractive processes.** Finally, although Studies 6 and 7 provide some indication that people do recognize the benefits of high-level construal for self-control, there is no empirical evidence that the people who seem to understand that high-level construal is advantageous are also more likely to engage in counteractive high-level construal when actually faced with a conflict. One way to test this possibility might involve pre-measuring lay theories about construal levels and self-control in advance of a laboratory session in which the use of counteractive high-level construal is assessed. To avoid the potential for demand effects if participants can recall aspects of the lay theory assessment, including a delay and using different construal measures in the two parts of the study would be important. Indeed, if content-free measures (like those used to assess global versus local processing) prove effective in capturing counteractive high-level construal, including them in the second part of the study could help to address this problem.

Further support for the utility of lay theories could also be derived from evidence that these lay theories themselves actually predict self-control behavior, possibly mediated by counteractive high-level construal. Therefore, in addition to assessing spontaneous construal processes, self-control behavior could also be recorded in the laboratory session. In this type of study, participants with lay theories that high-level construal is beneficial for self-control would be expected to show a greater likelihood of
actually engaging in high-level construal when faced with a conflict than those without such lay theories. Then, through this counteractive process, these same individuals would also be expected to demonstrate better self-control.

Assuming that any or all of these additional studies turn out as predicted, the current program of research has the potential to offer several unique and important insights across a variety of domains.

**Implications**

**High-level construal and self-control.** The present findings build on a growing literature highlighting the role of construal levels in self-control (e.g., Agrawal & Wan, 2009; Fujita & Han, 2009; Fujita et al., 2006; Magen & Gross, 2007; Mischel & Baker, 1975; Moore, Mischel, & Zeiss, 1976; Schmeichel & Vohs, 2009). Whereas past research has tended to focus on the consequences for self-control of experimentally manipulating construal level (for recent reviews, see Fujita, 2008; Fujita, Trope, & Liberman, 2010), the present studies examined people’s more spontaneous construal processes. These results serve both to provide preliminary evidence for individual differences in the tendency use high-level construal to represent impending temptation, and to demonstrate that this tendency predicts self-control success. Therefore, these counteractive construal shifts may be an important source of individual-level variance in explaining self-control success vs. failure.

The present studies may therefore have important implications for intervention and clinical practice. One such implication is the possibility of assessing counteractive high-level construal as a diagnostic tool with which to identify those vulnerable to future
self-control failures. Those who fail to evidence high-level construal at the prospect of temptations may be those least equipped to overcome them. Not only would such diagnostic assessment tools be useful in identifying individuals most susceptible to self-control failure, but they could also be used to guide subsequent targeted intervention by highlighting a specific deficiency to address.

In addition to suggesting spontaneous high-level construal as an indirect behavioral indicator of self-control success, the current studies also provide some initial evidence that individuals who have experienced past self-control success are better able to understand the advantages of high-level construal for self-control. These findings thus reveal not only that people are able to spontaneously overcome the tendency to construe proximal temptations concretely, but that people may be cognizant at some level that high-level construal promotes self-control, and that this awareness is associated with self-control success. Measuring individual differences in the ability to recognize the utility of high-level construal for self-control may thus indicate one potential source of deficient self-control.

Furthermore, although beyond the scope of the present findings, it is possible that the two phenomena documented in these studies may work together to enhance self-control success. That is, perhaps the capacity to understand the benefits of high-level construal for self-control may ultimately lead people to be better equipped to effectively deal with self-control conflicts by adopting high-level construal counteractively. This possibility would be profitably examined in future research, as this type of evidence would suggest that these knowledge disparities can lead to individual differences in self-
control success, rather than simply being a product of them. This distinction is especially relevant to the possibility of educating people on the role of high-level construal in self-control as an intervention strategy, as this would only be useful to the extent that such knowledge plays a causal role in self-control success. However, as briefly outlined earlier, while individual differences in the spontaneous use of high-level construal may be linked to this type of knowledge discrepancy, they may instead be associated with a discrepancy in the capacity to actually use this knowledge when faced with an impending self-control conflict (i.e. ability differences), or even from some combination of these two factors. These latter possibilities remain unexplored, and a complete understanding of individual differences in counteractive high-level construal will require additional research into the role each of these factors play in self-control success.

**Construal level and conflict recognition.** The present research addresses a specific situation in which people anticipate an impending self-control conflict. In these studies, the conflict was made obvious, in that participants were always informed that they would encounter a self-control conflict. These findings therefore offer useful insights for any real world circumstances when a self-control conflict is blatant or highly salient. For example, when a student is deciding whether or not go out with friends on the night before an important exam, or when a drug addict is deciding whether or not to go into rehab, the conflicting motives are clear. However there is an additional class of more ambiguous conflict situations in which successful self-control first depends on effective recognition of the conflict. The task of conflict identification is likely to be especially difficult in situations when temptations are available but the opposing goal is
less apparent. For example, many perceive eating a bag of buttery popcorn as simply a part of the movie-going experience. The health consequences of this decision may thus never come to mind, meaning that dieters may be unlikely to see this choice as a self-control conflict. In addition, conflict recognition is less likely anytime the harmful consequences of a single indulgent act are trivial (e.g. eating one miniature chocolate bar, or smoking one cigarette; Myrseth & Fishbach, 2009).

Therefore, beyond lack of knowledge or lack of ability to use counteractive high-level construal, an additional underexplored self-control breakdown point may lie at the phase of recognizing that a situation poses a self-control conflict in the first place. Myrseth and Fishbach (2009) theorize that high-level construal may be useful in these more ambiguous conflict situations as well. Specifically, they argue that conflict recognition is aided by understanding one choice as an instance of a broader class of similar choices – a feature characterizing high-level construal. The proposed usefulness of high-level construal for identifying self-control conflicts may generate interesting and important research questions, but the problem of conflict recognition is not the focus of the present set of studies. Instead, these studies explore the lay understanding and spontaneous use of counteractive high-level construal in situations when people are already aware of the conflict.

**Construal level and self-regulation.** Although completely consistent with previous work linking high-level construal to self-control success, the present findings may appear to contradict research that highlights the benefits of more concrete, low-level construal in self-regulation (e.g., Pham & Taylor, 1999; Schmeichel, Vohs & Duke,
Research by Vallacher, Wegner, and Somoza (1989), for example, has indicated that performance of difficult tasks is enhanced by low-level rather than high-level construal. When prompted to give a speech to an audience that was difficult vs. easy to persuade, low-level, not high-level, construal led to more persuasive arguments. Similarly, findings by Pham & Taylor (1999) suggest that students performed better on a midterm exam when they mentally simulated the instrumental means (e.g., good study habits) rather than desired end-states (e.g., getting a good grade) associated with preparing for the test. Collectively, these findings suggest that low-level construal can enhance self-regulation.

This apparent discrepancy may be resolved by drawing sharper distinctions between self-regulation and self-control. Self-regulation refers to the general category of processes by which people adopt, manage, and pursue various goals and standards for their thoughts, feelings, and behavior (e.g., Carver & Scheier, 1982; 1990; Fujita, 2011; Gollwitzer, 1990; Mann, de Ridder, & Fujita, in press). Self-regulation involves numerous challenges, which include deciding which goals to pursue, planning and implementing the actual pursuit of those goals, and deciding whether to continue or abandon goals following success or failure feedback (e.g., Gollwitzer, 1990; Mann, et al., in press). Self-control represents only one of these many self-regulatory challenges: promoting one’s more distal goals when enticed by more immediate and proximal temptations (Fujita, 2011). This dual-motive structure that uniquely characterizes self-control conflicts suggests that, although high-level construal promotes self-control, it may not promote the resolution of other self-regulatory challenges.
Consider, for example, a golfer attempting to make a tricky putt to win a tournament. Successful performance requires careful regulation of one’s balance and hand-eye coordination in service of one’s athletic goals (e.g., Baumeister, 1984; Beilock & Carr, 2004). Yet, it may be inappropriate to characterize this example as a self-control conflict, as golfers are generally not tempted to miss their putts. In the absence of a self-control conflict, high-level construal might actually impair effective performance, relative to low-level. Indeed, considering the abstract implications of successfully sinking the putt may lead to “choking” and underperformance (e.g., Baumeister, 1984; Beilock & Carr, 2004). Thus, determining the level of construal likely to enhance self-regulation requires a nuanced consideration of the self-regulatory challenges people are attempting to overcome.

The most striking discrepancy between the present findings and the published literature may be the difference between Study 5 and work by Pham & Taylor (1999). These researchers suggest that simulating the process of studying rather than the enjoyment of receiving a good grade enhances exam performance. To many, this may suggest that low-level, rather than high-level, construal should enhance exam performance, in apparent contradiction to the results of Study 5 in the current package. There are two important differences to note, however. First, the simulation of processes vs. outcomes is independent from low-level vs. high-level construal. One can represent both the process and the outcome of studying concretely or abstractly. As an example, one can construe good study habits (process-oriented simulation) either in terms of pictures or words; similarly, one can construe getting a good grade (outcome-oriented
simulation) either in terms of pictures or words. Whereas Pham & Taylor (1999) focus on the effects of thinking about different content (process vs. outcome), the current findings focus on the effects of different representational processes (low-level vs. high-level construal) of the same content. Second, as noted earlier, people may underperform on academic exams for multiple reasons, not all of which represent self-control failure. Although some students may fail to study properly because they are tempted by non-academic distractions (self-control failure), others may fail because of misprediction (e.g., under-estimating the amount of time required to study adequately; neglecting to consider how a noisy coffee shop may make studying more difficult). High-level vs. low-level construal may help to resolve the former performance obstacle but not the latter, whereas process- vs. outcome-oriented simulation may be effective in resolving the latter but not the former (for a similar argument about prediction error, see Taylor et al., 1998). Thus, Study 5 of the current work and Pham & Taylor (1999) may focus on two very different self-regulatory problems: self-control failure vs. misprediction.  

**Overcoming the association between psychological distance and abstraction.**

The present work also represents an important advance for CLT. As noted earlier, CLT proposes that abstraction is a functional response to the challenge of mentally traversing psychological distance. To conceptualize distant events about which they lack specific and idiosyncratic detail, people engage abstraction processes which allow them to extract the essential, core, and goal-relevant features likely to be invariant. Much of CLT research is predicated on the notion that a cognitive association develops between psychological distance and construal, such that distant events are construed in higher-
level terms and proximal events are construed in lower-level terms (Amit et al., 2009; Bar-Anan et al., 2006). By integrating CLT with counteractive control theory, the present research provides a conceptual framework with which one can posit mechanisms that allow people to “break” or counter this association, systematically engaging in high-level construal of events even when they are proximal. The present results support this proposition. Those motivated to watch their weight, for example, represented an impending cookie taste test – one that was proximal in time, space, social distance, and hypotheticality – via high-level construal (Study 1). Thus, in addition to psychological distance, people seem to have other mechanisms that regulate and determine at what level they construe events (see also Marguc et al., 2011).

The present findings, however, neither contradict nor undermine the tenets of CLT. CLT suggests that the underlying function of abstraction (i.e., high-level construal) is epistemic. When attempting to understand and effectively plan for distant events, people engage in abstraction to anticipate what goal-relevant features are likely to be evident and to orient their present judgments, decisions, and behavior accordingly. High-level construal may serve a similar epistemic function in the current studies. Concrete and proximal temptations may “crowd out” one’s more abstract and distal goals in a given context. Counteractive high-level construal may help people better selectively attend to and weight in judgment and decision those features in the present that are central to their goals. Stated differently, high-level construal helps to provide and sustain the long-term perspective that psychological distance affords, ensuring that thoughts, feelings, and behavior in the present are consistent with valued ends.
Construal level and the affect-dampening effects of abstraction. A great deal of research suggests that more abstract, high-level construals can temper “hot” or “visceral” reactions to salient stimuli (e.g., Ayduk & Kross, 2008; Kross & Ayduk, 2008; Kross, Ayduk, & Mischel, 2005; Loewenstein, 1996; Metcalfe & Mischel, 1999; Mischel, Shoda, & Rodriguez, 1989). Although abstraction may dampen strong affective reactions under certain conditions, it is important to note that abstraction and emotion are conceptually independent (see also Fujita, 2008; Fujita et al., 2006b; 2010). For example, re-construing an insult more abstractly as an affront to one’s honor may increase rather than decrease one’s emotional arousal (e.g., Cohen, Nisbett, Bowdle, & Schwarz, 1996). Emotional responses themselves might also be distinguished in terms of abstraction. For example, love and lust may both be understood as emotions, yet they differ in abstraction (Förster, Özelsel, & Epstude, 2010; see also Eyal & Fishbach, 2010). Thus, although it may at times serve an affect-dampening function, abstraction may serve other functions that either have no effect on affective experiences or at other times may even enhance them.

Empirically, results from the present work highlight the independence of construal levels and emotion. Although it may be possible to interpret the results of Study 1 as reflecting a cognitive cooling response to salient food temptations, academic achievement would appear to represent a domain less “visceral” than food, yet counteractive high-level construal was still evident in that context (Studies 2 & 5). Studies 3 and 5 also demonstrated that high-level construal can be triggered by goal-threatening future events without corresponding changes in the perceived emotionality of
those events. Although the present findings are not readily attributable to the “cooling” function of abstraction, this in no way undermines the value of affect reduction for the successful resolution of self-control conflicts. Indeed, in situations where temptation is driven by one’s emotional or visceral responses, the epistemic (knowing what I want) and affect dampening functions of high-level construal may work hand-in-hand to promote self-control success (i.e., knowing what I want helps to dampen my positive emotional reactions to temptations and vice versa). Therefore, although the current results do not appear to be reducible to affect-reduction, it is important to recognize that high-level construal may enhance self-control in the messiness of the real world though multiple mechanisms.

**Counteractive control.** The present studies also build on a growing literature documenting the various cognitive and behavioral mechanisms and strategies that people engage to counteract the deleterious effects of proximal temptations on effective goal pursuit (Trope & Fishbach, 2005). Given that high-level construal appears from the present results to represent one of many forms of counteractive control, important questions arise about how people choose among the various counteractive mechanisms and strategies available to them. As proposed by Fujita (2011), an individual’s aptitude (or perceived aptitude) for each of the various counteractive strategies may play a role in how often they are used. For instance, someone who is consistently able to forecast potential conflict situations and avoid encountering them may have no reason to develop or use other forms of counteractive control such as counteractive high-level construal. In addition, beyond determining whether any form of counteractive control is initiated, how
much a person values the imperiled goal may also influence whether people are content with relying on a single counteractive mechanism such as counteractive high-level construal, or whether they supplement this one strategy with others. For example, the more one values a threatened goal, the more likely one might be to engage in multiple counteractive control mechanisms in parallel, thus ensuring a “backup” should any single mechanism fail. Future research addressing these questions of when people select and use particular counteractive strategies over others will provide a more complete picture of the counteractive control process.

Another question that arises is whether the various forms of counteractive control are functionally equivalent, in that any one strategy can be substituted for another, or whether some forms are more fundamental in that their activation or use is necessary before others can be initiated. For example, it is possible that high-level construal or other cognitive strategies like asymmetric temptation-goal associations (e.g., Fishbach et al., 2003), are necessary for people to appreciate the need for other behavioral forms of counteractive control, such as self-imposed punishment (e.g., Thaler & Shefrin, 1981; Trope & Fishbach, 2000). Initial support for this latter assertion comes from work by Fujita and Roberts (2010), who demonstrated high-level rather than low-level construal promoted on the use of counteractive strategies like self-imposed punishment to protect valued goals. This suggests the possibility that counteractive high-level construal may represent an essential first step in the engagement of other behavioral forms of counteractive control. Future research should further explore the relationship between the cognitive and behavioral forms of counteractive control, and might usefully assess to
what extent the behavioral forms are contingent on the cognitive.

Similar questions can be raised about interactions between the various cognitive forms of counteractive control. For instance, rather than functioning separately, perhaps some of these documented mechanisms reflect different aspects of the same (broader) cognitive response. It is possible, for example, that the asymmetric temptation-goal associations (in particular, the activation of goals by temptations; Fishbach et al., 2003) prompt the high-level construal observed in the present studies. Conversely, high-level construal may promote asymmetric temptation-goal associations. Although no research yet directly addresses either of these possibilities, some preliminary evidence for the latter comes from work by Fujita and Sasota (2011), which revealed that asymmetric temptation-goal associations were more likely among those representing events via high-level rather than low-level construal. It is conceivable, then, that high-level construal may be a necessary first step for other cognitive forms of counteractive control to be activated. Additional research, however, is required to test this possibility and, more broadly, to explore how the various cognitively based counteractive processes may function in concert to promote self-control.

**Future Directions**

**Developing a diverse battery of construal measures.** As noted earlier, the value and utility of the present line of research critically depends on developing valid and reliable measures of construal. Most of the present studies tap into construal processes imperfectly, through self-reported measures of the outcomes of those processes. To critics, this creates uncertainty regarding whether or not construal level is actually being
assessed, and may detract from any claims that can be made about counteractive high-level construal. Ideally, indirect measures would be used that also more precisely assess the high and low-level construal processes themselves. Although the behavioral segmentation measure discussed above may provide a good starting point, it has yet to be fully validated. Nonetheless, even if such a measure proves to be both reliable and valid, developing other compelling means of construal assessment would be useful in providing convergent evidence for the process. Furthermore, in some multi-part studies, employing different construal measures may be necessary, and there are also some conflict situations in which a meaningful behavioral segmentation task may be difficult to implement. For example, if one uses a cheating scenario as a self-control conflict, having participants tally meaningful units in a video that clearly depicts cheating would introduce demand characteristics and would almost certainly influence subsequent cheating behavior. Taken together, these considerations reveal the value of developing a battery of alternative construal measures designed to overcome some of the drawbacks of the measures used in the present studies.

With this goal in mind, several unexplored options for measuring construal level seem worth pursuing. For instance, it may be possible to build on the measure of picture versus word representations used in the current studies to create a more indirect measure. Perhaps individuals engaging in high-level (vs. low-level) construal would be quicker to identify word as opposed to picture representations of goal-relevant objects, since these representations are more likely to fit with their spontaneous representations.

In addition, given that high-level construal is associated with increasing
psychological distance, perhaps a measure could be created to capitalize on this relationship. For instance, individuals led to anticipate a cookie taste test could then be asked to judge the physical distance to the taste test location, or the amount of time before the taste test will begin. Although such a measure would not directly ask participants to report their construal of the taste test, higher-level construal processes would be expected to lead to greater distance and time judgments.

The processing differences associated with high versus low-level construal may suggest additional assessment tools. Whereas high-level construal is defined by configural processing, which involves the extraction of broad, category-level invariances, low-level construal necessarily involves more featural processing with greater attention to specific idiosyncratic surface-level detail (e.g. Wyer, Perfect & Pahl, 2010; Hunt & Carroll, 2008). This discrepancy should result in different strengths when it comes to matching items on superficial features. For instance, if individuals anticipating a chocolate chip cookie taste test were then shown an image of the cookie they will be tasting, those processing at a lower level should be quicker and better able to find the exact cookie they saw among a group of distractor cookies. Thus, the ability to find the exact match to a temptation people expect to face could be used as an indicator of an individual’s level of construal.

One further means of more directly tapping into the construal process might involve reformulation of construal level mindset manipulations. Considering the Why/How task (Freitas, et al., 2004), for example, if people are led to anticipate a cookie taste test, one way to assess their construal of this event might involve presenting them
with a choice between completing either a “why” task (in which people list increasingly superordinate ends for participating in a cookie taste test) or a “how” task (in which people list increasingly subordinate means for the same behavior). Theoretically, high-level construal should facilitate completion of the “why” task, whereas low-level construal should facilitate the “how” task due to the relative fit between these processing styles and the tasks’ demands. As a result, higher levels of construal should predict greater preference for completing the “why” task over the “how” task. Although each of these suggested measures has a theoretical basis, none of them have been used previously, making them untested possibilities in need of validation.

As noted earlier, one type of construal measure that has been used in other lines of research, but not in the present studies, involves assessing global versus local processing styles. These processing styles are known to be associated with construal level (e.g. Liberman & Förster, 2009; Förster & Dannenberg, 2010), so assessing them may be a useful way to capture the construal process. For example, the Kimchi-Palmer task (Kimchi & Palmer, 1982) is often used to assess global versus local processing styles. In this task, individuals are shown a series of images in which a set of small shapes forms a larger shape (e.g. three circles forming a triangle), and are asked to choose which of two options is a better match. On each trial, one of the options presented matches the global features (i.e. the shape of the composite large figure) but not the local, and the other matches on local features (i.e. the shape of the constituent small figures) but not global. People who match based on the smaller constituent shapes are said to be displaying local processing, which is associated with low-level construal, whereas those who match based
on the larger composite shape are said to be processing more globally, which is
associated with high-level construal.

Individuals led to anticipate a self-control conflict might be expected to display
more of a global focus on the Kimchi-Palmer task, simply because counteractive high-
level construal might induce a more global processing style. This type of measure may
be advantageous in that it is content-free, meaning that it only reflects the construal
process and in no way relies on the researcher’s ability to predict the end point of that
process. However, there are also potential drawbacks to this type of measure. As noted
previously, if the spontaneous construal process is engaged counteractively to undermine
the specific goal threat posed by a self-control conflict, then the process may only be
evident on measures that are conflict-relevant. However, the effectiveness of these types
of measures for capturing counteractive high-level construal is an empirical question, so
exploring these and other ways to move closer to the challenging ideal of assessing the
construal process will be an important goal for future research.

Origins and mechanisms of counteractive high-level construal. Future
research should also explore the origins and mechanisms by which people learn to engage
in high-level construal of impending self-control conflicts. One possibility is that with
repeated trial-and-error, people learn (either implicitly or explicitly) that high-level
construal promotes self-control success and low-level construal promotes self-control
failure. Over time, people may form a cognitive association between construal levels and
self-control such that recognizing a self-control conflict is sufficient for initiating the
construal of events in higher-level terms. A motivational mechanism is also possible.
Having recognized, at some level, the role of construal levels in self-control, people may engage in high-level construal to enhance the likelihood of self-control success. These two mechanisms may be difficult to distinguish empirically. The former assumes to some extent that people are motivated to have effective self-control, whereas the latter assumes that people have learned a cognitive association between effective self-control and high-level construal. In all likelihood, like many other psychological phenomena, cognitive and motivational processes interact and are inextricably linked. Understanding why some are able to leverage these processes and develop functional cognitive responses to self-control conflicts, and others are not, is an important future area of research investigation.

**Conclusion**

The present studies provide empirical evidence for mechanisms that allow people to counter the tendency for proximal temptations to prompt low-level construal, and that these counteractive mechanisms, in turn, appear to enhance self-control. These data offer initial steps in exploring these ideas, and raise several additional questions for future research. As the present findings suggest, gaining a better understanding of the antecedents and consequences of spontaneous high-level vs. low-level construal of events may help to illuminate why some succeed and others fail in their self-control efforts. Given the important role that self-control plays in both significant and mundane life events, and the high costs associated with self-control failure, the potential benefits of this knowledge are considerable.
Footnotes

1. Note that performing a planned contrast with weights that match our predictions is identical mathematically to the statistical test of the interaction term in this factorial ANOVA (Rosenthal & Rosnow, 1991). The interaction term reported thus represents the most statistically powerful and direct test of our predictions, obviating the need for follow-up analyses.

2. This gender effect was particularly surprising given that a similar analysis in Study 3 revealed that gender had no significant effect on the use of words ($M_{men} = 3.56, M_{women} = 3.40), t(106) = .42, p = .69,$ or the use of picture representations ($M_{men} = 6.76, M_{women} = 6.60), t(106) = .50, p = .62.$ No gender effects have been reported in past research assessing picture vs. word representations (Amit et al., 2009).

3. This analysis assessing the indirect effect of motivation on grade improvement, through construal also revealed a significant effect of gender on grade improvement. Specifically, after controlling for the effects of motivation and construal on grade improvement there was also a tendency for men to be less likely to show grade improvement than women, $b = -.03, SE = .01, t(38) = -2.46, p = .02.$

4. The predicted interaction remains significant when these individuals are included, and the pattern of results, although weaker, is also unchanged.
Research on implementation intentions may also appear to contradict these assertions and findings. Implementation intentions are specific plans that cognitively associate a particular context with a particular behavior in an “if-then” semantic structure (e.g. Gollwitzer, 1999). These plans have been repeatedly shown to promote goal attainment (e.g., Gollwitzer, 1999; Gollwitzer, Fujita, & Oettingen, 2004; Gollwitzer & Sheeran, 2006). Planning, however, requires understanding how various specific actions serve the same end. One cannot plan unless one appreciates what goals that plan is intended to achieve and whether such plans may interfere with other goals. Planning may thus be contingent on initially construing events more abstractly (for further discussion, see Fujita, 2008; Fujita & Roberts, 2010; Fujita et al., 2006).
References


