

Self-Control in Action: Implicit Dispositions Toward Goals and Away From Temptations

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Five studies examined whether, in self-control dilemmas, individuals develop an implicit disposition to approach goals and avoid temptations, psychologically as well as physically. Using a method developed by A. K. Solarz (1960; see also K. L. Duckworth, J. A. Bargh, M. Garcia, & S. Chaiken, 2002), the authors assessed the time for pulling and pushing a lever in response to goal- and temptation-related stimuli (e.g., studying and partying). The results show that individuals offset the influence of tempting activities by automatically avoiding these stimuli (faster pushing responses) and by approaching stimuli related to an overarching goal (faster pulling responses). These implicit self-control dispositions varied as a function of the magnitude of the self-control conflict, itself defined by how strongly individuals were attracted to temptations and held the longer term goal. These dispositions were further shown to play a role in successful self-control.

Keywords: self-control, self-regulation, approach, avoidance, implicit processes

There is, as the saying goes, often a price for success: In striving to attain our long-term dreams and ambitions, we often must forgo momentary pleasures and amusements. Psychologists have long recognized that these little sacrifices typically are not easy, as the lure of momentary temptations can be pervasive. How do we stay the course and finish a long paper when we could be watching must-see TV? How do we forgo a dinner with friends to stick with our workout schedule? As these examples demonstrate, everyday choice and behavior often involve a struggle between opposite behavioral tendencies. Whereas all goals represent desirable end states that individuals would ordinarily wish to approach, many important, long-term goals require that individuals give up other, relatively lower priority pursuits that might otherwise hinder the attainment of these enduring goals. We label such obstacles *temptations*, and, in line with previous conceptualizations, in the present analysis we assume that people come to avoid temptations and approach overarching goals through the processes of self-control (Dhar & Wertenbroch, 2000; Freitas, Liberman, & Higgins, 2002; Gollwitzer, 1999; Kivetz & Simonson, 2002; Kuhl, 1986; Loewenstein, 1996; Metcalfe & Mischel, 1999; Muraven & Baumeister, 2000; Trope & Fishbach, 2000).

The aim of the current investigation is to explore some of the most fundamental and, perhaps, automatic dispositions toward

approaching goals and avoiding temptations. In particular, we test for basic and implicit behavioral predispositions toward approaching (i.e., pulling forward) and avoiding (i.e., pushing away) motivationally relevant stimuli outside of conscious awareness or deliberate control. We also seek to explore the impact of these automatic behavioral responses on resisting temptations to specify their link to self-control operations.

Temptations and the Self-Control Dilemma

A self-control dilemma represents an internal conflict between different behavioral plans, one of which is of greater long-term importance than the other (Ainslie, 1992; Baumeister, Heatherton, & Tice, 1994; Dhar & Wertenbroch, 2000; Loewenstein, 1996; Rachlin, 1997; Thaler, 1991; Trope & Fishbach, 2000). To accomplish the higher priority goals, individuals need to resist the momentarily salient yet lower priority temptations with which the more important goals are in conflict. Our analysis, then, assumes that temptations are defined within a given situation and with respect to the longer term goals at hand. This context-specific definition of temptations suggests that individuals strive toward multiple, often inconsistent goals (Cantor & Blanton, 1996; Kruglanski et al., 2002) and that any personal goal can potentially constitute an interfering temptation with respect to another, even more important goal. For example, whereas working out may be perceived as interfering with the pursuit of long-term academic objectives, this activity may, in many other contexts, represent a goal that is itself disrupted by other activities, such as the consumption of unhealthy food. Furthermore, two competing personal goals (e.g., working out and studying) may each serve as an interfering temptation for the other, moving back and forth be-

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tween their status as goal and temptation. The perception of a given personal objective as a goal or temptation is therefore context specific, depending on the situation, the individual, and the concurrent activation of other personal goals.

Approaching Goals, Avoiding Temptations

Once a personal objective comes to be perceived as a temptation with respect to another overarching goal, it should be avoided. However, because temptations are goal states that are inherently attractive, they may naturally invoke quite the opposite response, presenting a self-control dilemma. Thus, to the extent that individuals would like to approach some temptations that interfere with overarching goals (e.g., unsafe sex, substance abuse, or overspending), self-control conflicts will inevitably emerge. In terms of pursuing the overarching goal, then, the successful resolution of such conflicts requires that one avoid the tempting activities that one would ordinarily approach.

Previous research on self-control has shown that, in response to goal conflicts, people use a variety of strategies that increase the likelihood of adhering to a long-term goal and decrease the likelihood of succumbing to temptation (Fishbach & Trope, 2005; Kuhl & Beckmann, 1985; Metcalfe & Mischel, 1999; Thaler, 1991; Wertenbroch, 1998). Most relevant to the current analysis, one way people may secure the attainment of long-term goals is by keeping distance from tempting objects and maintaining close physical proximity to objects that are associated with their long-term objectives (Ainslie, 1992; Schelling, 1984; Thaler & Shefrin, 1981). For example, foreseeing their inability to resist smoking when cigarettes are available, people choose to eliminate the presence of cigarettes from their house (Wertenbroch, 1998), or, foreseeing the problem that a previous romantic partner may impose, people sometimes move to a different city or job.

By maintaining distance from tempting stimuli and proximity to goal-related stimuli, people increase the likelihood of adhering to their long-term goals. It is important to note that, whereas these processes are often high level and deliberative, they may often need to be quick and efficient; thus, it may be of significant self-regulatory benefit for individuals to develop a quite general and implicit disposition toward approaching goals and avoiding temptations. Such a disposition may cancel out the general tendency to approach temptation-related stimuli under different motivational conditions, and it may involve a fundamental orientation toward goal-related stimuli and away from temptation-related stimuli: One may literally or psychologically pull oneself toward goals and push oneself away from temptations.

Implicit Self-Control

Self-control has often been portrayed as a complex and deliberate mental function (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Gollwitzer, 1999; Metcalfe & Mischel, 1999). For instance, the construction of reasons in favor of pursuing high-priority goals may often require conscious retrieval and elaboration (Mischel, 1984; Mischel, Cantor, & Feldman, 1996), and precommitting oneself to goal pursuit by means of eliminating tempting alternatives may often require deliberative planning (Ainslie, 1975; Becker, 1960; Thaler & Shefrin, 1981). It is not surprising, then, that prior theorizing and research have tended to depict the self-

control process as conscious and relatively effortful (Gollwitzer, 1990; Mischel et al., 1996; Muraven & Baumeister, 2000).

More recently, however, research has demonstrated that deliberate and complex self-control operations are often accompanied by more automatic and efficient self-regulatory associations, which act both outside of conscious intention and independently of available mental resources (Fishbach, Friedman, & Kruglanski, 2003; Gollwitzer, Bayer, & McCulloch, 2005; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999; Shah, Friedman, & Kruglanski, 2002). This research suggests, for instance, that individuals may automatically inhibit distractors or temptations (Shah et al., 2002; Shallice, 1972), facilitate the activation of overriding goals (Fishbach et al., 2003), or activate implementation plans for these goals (Gollwitzer et al., 2005). Whereas previous work has mainly focused on specific implicit associations between mental constructs (e.g., goals, means, and temptations), in the present research we examine whether self-control may additionally involve broad and fundamental implicit dispositions toward motivational concepts.

Implicit Dispositions for Approach and Avoidance

We predict that success at self-control may involve general, implicit predispositions toward approaching goal-related cues and avoiding temptation-related cues, psychologically as well as physically, and that these predispositions, in turn, may offset the tendency to approach temptation-related cues that hinder goal attainment. An automatic inclination toward approaching desirable stimuli and avoiding undesirable stimuli was originally demonstrated by Solarz (1960), who found that people were faster to pull a lever toward them to indicate that a stimulus was positive and pull a lever away from them to indicate that a stimulus was negative. These predispositions toward approaching positive stimuli and avoiding negative stimuli have been replicated elsewhere and have been shown to depend on the presentation of the self in space, relative to the evaluated stimuli (Markman & Brendl, 2005). It is important to note that, whereas these low-level responses reflect the affective value of the presented stimuli, they nonetheless tap into something slightly different than affective evaluation—that is, one's behavioral disposition toward the presented stimuli, which is arguably affected by one's affective evaluation of these stimuli.

Bargh and colleagues (Chen & Bargh, 1999; Duckworth, Bargh, Garcia, & Chaiken, 2002) demonstrated parallel approach and avoidance responses, in the absence of conscious awareness, to the goal to evaluate the affective targets, and others have demonstrated similar effects using other behavioral responses that correspond to approach and avoidance dispositions (Cacioppo, Priester, & Bernston, 1993; Epley & Gilovich, 2001; Neumann & Strack, 2000). Together, these studies further support the idea that people approach and avoid stimuli automatically—that is, without conscious control over the speed of their responses or conscious awareness of the association between these ideomotor responses and approach-avoidance motivation.

However, these automatic dispositions should not be necessarily rigid or fixed. Researchers have long understood that how one comes to respond to a stimulus may be dependent on the interaction between one's chronic orientation and one's current needs or goals (see Allport, 1955; Bruner, 1957; Jones & Gerard, 1967). A

normally aversive or attractive state (e.g., being hungry or full) may elicit a very different response under certain motivational conditions (e.g., when one is trying to lose weight). Such conditionality may also apply to the self-control dilemma described earlier: To the extent that individuals are currently committed to pursuing a long-term goal, they may demonstrate a disposition to avoid temptations and approach goals—even when both are similarly attractive in the moment.

We explore this possibility in the present research by using a method similar to that used by Solarz (1960) and others (e.g., Chen & Bargh, 1999; Markman & Brendl, 2005). That is, we measured participants' response times to goal- and temptation-related concepts when they were asked to either approach by pulling a lever down or avoid by pulling a lever up. Such a design allows us to examine the hypothesis that effective self-regulation is characterized by a personality disposition toward approaching goals and avoiding temptations and that these implicit dispositions are more pronounced with respect to important goals as well as attractive temptations (i.e., temptations that one would ordinarily approach).

The Determinants and Consequences of Implicit Self-Control

If implicit dispositions are linked to efforts at self-regulation, they should be elicited by a self-control conflict, which arises when one is attracted to a temptation that would hinder the pursuit of a current overarching goal. Note that this conflict (as well as the self-control responses it elicits) requires that one currently hold at least one long-term goal that potentially would be harmed if one indulged in the given temptation. Our analysis predicts that, when they hold such a goal, individuals will demonstrate a relatively greater explicit and implicit tendency not only to approach the goal in question but to avoid attractive but hindering temptations. Alternatively, when they do not hold such a long-term goal, individuals may simply be motivated to indulge in the temptation, as it is, by definition, attractive (at least in the short-term), and thus may only demonstrate an explicit and implicit tendency to approach temptations—a tendency that increases with the temptation's overall attractiveness. Thus, for example, whereas dieters should be predisposed to approach the goal of fitness and avoid food temptations, nondieters may not demonstrate these specific response patterns and may instead show a predisposition to approach food.

Moreover, although self-control conflict requires that one currently hold a relevant long-term goal, it may also be affected by the strength of the temptation: how much one is attracted by the possibility of indulging in it, and, therefore, how much self-control conflict it creates in threatening the continued pursuit of the overarching goal. The self-control response that is elicited by a stronger temptation may, in turn, depend on individual differences in the effectiveness of the self-regulator. That is, when temptations are particularly strong, only effective self-regulators (but not ineffective self-regulators) may show an even greater predilection to approach goals and avoid temptations.

Indeed, this prediction is consistent with previous research on counteractive processes of self-control, which has demonstrated that strong temptations trigger more self-control efforts among individuals who hold a long-term goal (Fishbach & Trope, 2005; Trope & Fishbach, 2000). For instance, effective dieters increase

their dieting attempts when facing attractive food options (e.g., Fishbach et al., 2003). If effective (vs. ineffective) self-regulators exert relatively stronger self-control in the face of strong temptations, relatively tempting distractors may elicit both greater implicit avoidance of the temptation and greater approach toward the relevant long-term goal.

In terms of the *consequences of self-control*, the ultimate objective of predispositions toward avoiding temptations and approaching goals is that one is more likely to succeed at pursuing some goals. As we have indicated, we predict that whereas effective self-regulators are more likely to approach goals and avoid temptations, poor self-regulators will chronically fail to do so. Our measure should therefore allow us to clearly distinguish between effective and ineffective self-regulators and thus should assess individual variations in implicit response patterns that correspond to successful goal attainment. Given the general importance of self-control across many life aspects (e.g., Muraven & Baumeister, 2000; Shoda, Mischel, & Peake, 1990), a measure of individuals' implicit self-control tendencies may prove quite important. Such a measure, for instance, could possibly predict individuals' success at dieting through their tendency to approach diet-related concepts (e.g., fitness) and avoid concepts related to food temptations (e.g., sweets). Furthermore, if implicit dispositions directly influence individuals' choice of actions, to the extent that we can manipulate the strength of these predispositions, we will further influence individuals' subsequent choice to pursue a long-term goal. Taken together, the proposed procedure should allow us to measure and influence implicit self-control.

The Present Research

We tested these predictions in five experimental studies. In each study we presented participants with a category judgment task, in which they were asked to respond to goal- and temptation-related target words by either pulling a standard joystick toward them or pushing the joystick away from them. The joystick was placed in front of each participant and provided a natural setting for assessing the time for pulling (approaching) and pushing (avoiding) the relevant stimuli outside of participants' explicit awareness. This joystick task is, furthermore, closely related to procedures that have previously been used to obtain approach and avoidance responses (e.g., Chen & Bargh, 1999). The goal domains investigated in these studies included idiosyncratic self-generated goals, weight loss and fitness, and academic goals.

In the first study, we test for a general disposition toward approaching goals and avoiding temptations for participants' own goals and temptations. In Study 2, we examine whether these implicit dispositions depend on whether participants are currently holding an overarching goal. In Study 3, we examine whether these dispositions depend on the strength of interfering temptations and whether they are related, in turn, to effective self-regulation. Finally, in Studies 4–5 we examine whether experimentally induced approach and avoidance behavioral responses implicitly affect the pursuit of goals and efforts to overcome temptations.

Study 1: Approaching Goals and Avoiding Temptations

In our first study we assess for a general predisposition toward approaching goals and avoiding temptations. Participants com-

pleted a lexical decision task with their own goals and temptations embedded in it. They were asked to respond to these words by either pulling or pushing a joystick. Using this procedure, we sought to demonstrate that individuals are predisposed to pull goals and push temptations.

Method

Participants

Forty-eight University of Chicago undergraduates (29 women and 19 men) participated in the experiment in return for \$4.

Procedure

This study used a Target (goal vs. control vs. temptation) \times Response (pushing vs. pulling) mixed-subjects design. Participants completed the procedure on desktop computers using a standard Logitech (Fremont, CA) Wingman joystick, which was positioned at the center of the desk between the participant and the computer monitor.

Self-generation of goals and temptations. The computer program first instructed participants to list a goal, defined as a behavior or activity that they pursue and that “is positive in the long-term, but negative in the short-term,” and a temptation, defined as a behavior or activity that they pursue and that “is positive in the short-term, but negative in the long-term.” As a control, participants were asked to list a behavior or activity that other people pursue and that was neither a goal nor a temptation for them. Participants were asked to list only one-word items. This procedure was adapted from research by Giner-Sorolla (2001) and resulted in an important goal (e.g., study, exercising), an attractive temptation (e.g., movie, alcohol), and a control activity (e.g., dancing, internship) for each participant.

Joystick lexical decision task. Next, participants completed a lexical decision task on the computer. They were presented with a series of letter strings and were asked to decide as quickly as possible whether each letter string was a word. Half of the participants were asked to pull the joystick toward them if the letter string was a word and push the joystick away from them if the letter string was not a word. The rest of the participants were asked to pull the joystick toward them if the letter string was not a word and push the joystick away from them if the letter string was a word. At the beginning of each trial, a fixation point (a plus sign) appeared at the center of the screen for 200 ms. Participants were asked to focus their attention on this sign. The fixation point was then replaced by a target letter string, presented until the participants responded. Each response was followed by a 500-ms pause, followed by the next trial.

After 6 practice trials, which included an equal number of words and nonwords, participants commenced the main part of the lexical decision task. In this part, each goal-related keyword, temptation-related keyword, and control keyword appeared four times, resulting in 12 experimental trials. These trials were embedded within other trials that included familiar neutral target words and nonwords. The nonwords were sampled from a list of 100 pronounceable letter strings (e.g., *langen*, *riment*). Overall, 120 experimental trials were presented, with an equal number of words and nonwords. On completion of the task, participants were debriefed and dismissed. None of the participants were able to identify the purpose of the joystick lexical decision task.

Results and Discussion

Manipulation Check

A general disposition toward avoiding (vs. approaching) temptations more than goals could possibly be attributed to a greater inherent negative valence of tempting stimuli (e.g., Duckworth et

al., 2002) rather than to the goals’ motivational qualities. To rule out this alternative, we had four independent judges evaluate all goal and temptation stimuli ($\alpha = .71$); they rated the extent to which each stimulus represented a pleasant activity (on 7-point scales). These ratings revealed that, for observers, goal-related stimuli ($M = 3.85$) were actually more negative than tempting stimuli ($M = 5.06$), $t(56) = 5.29$, $p < .01$. Thus, it was unlikely that a tendency to approach goals and avoid temptations would reflect differences in their inherent attractiveness.

Self-Control Dispositions

Because the latency of incorrect responses would be difficult to interpret, we used only correct responses in all the subsequent analyses (see Bargh, Chaiken, Govender, & Pratto, 1992; Fazio, 1990). To lessen the influence of outliers, we first transformed all individual response times using a natural log transformation and then excluded those that were more than three standard deviations from the cell mean (Bargh & Chartrand, 2000; Fazio, 1990).¹

An initial repeated measures multivariate analysis of variance (MANOVA) on participants’ responses (goal vs. control vs. temptation) that controlled for any gender effects² yielded a main effect for experimental condition (pulling vs. pushing), $F(1, 43) = 6.24$, $p = .01$, indicating that participants were faster overall to respond by pulling than by pushing. It also revealed the predicted interaction of experimental condition and type of response, $F(2, 88) = 7.48$, $p < .01$, indicating that the effect of response type significantly varied by experimental condition.

To further specify the nature of this interaction, in subsequent analyses we examined participants’ responses in the pushing and pulling conditions separately. First, we used within-subject analyses to compare the speed with which participants pulled goal-related words with their speed at pulling temptation-related words and control words. These separate analyses revealed that participants were faster to pull goal-related words ($M = 615.01$ ms) than temptation-related words ($M = 636.66$ ms), $F(1, 25) = 6.73$, $p < .05$, or control words ($M = 630.26$ ms), $F(1, 25) = 4.00$, $p = .05$. Second, within-subject analyses also compared the speed with which participants pushed temptation-related words with their speed at pushing goal-related words and control words. These separate analyses revealed that participants were faster to push temptation-related words ($M = 648.11$ ms) than goal-related words ($M = 718.84$ ms), $F(1, 19) = 11.33$, $p < .01$, or control words ($M = 684.87$ ms), $F(1, 19) = 4.49$, $p < .05$. This pattern of results is illustrated in Figure 1. These results provide initial support for the notion that overarching goals elicit an implicit approach response, whereas tempting stimuli elicit an automatic

¹ The percentage of errors for the categorization tasks’ trials was 5.7% in Study 1, 5.5% in Study 2, 5.2% in Study 3, and 3.4% in Study 4.

² To address the possibility of gender differences in the goals investigated in these studies (especially with respect to dieting and food consumption goals, which were focal goals in Study 2 and commonly self-generated in Study 1), we controlled for the effects of gender in all our analyses. The only exception was for the analyses pertaining to Study 5, which included only female participants. Although there were generally more female dieters, gender did not interact with other variables in our studies, and the results remain essentially unchanged if gender is not included in the analyses.

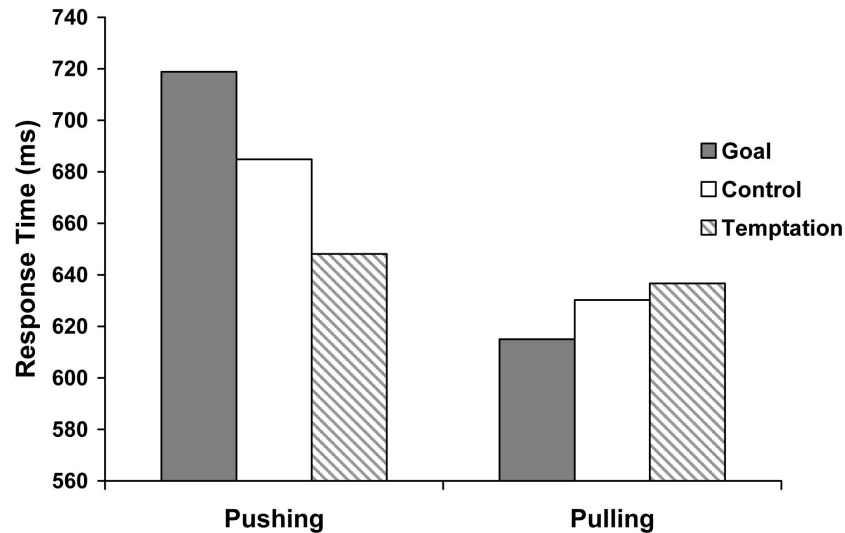


Figure 1. Response times for pushing versus pulling self-generated goal, control, and temptation targets (Study 1).

tendency toward avoidance. To the extent that individuals wished to attain some long-term objectives, they were faster to provide an approach response (i.e., pulling) to relevant cues and an avoidance response (i.e., pushing) on encountering temptations.

However, Study 1 was not designed to test for individual differences in implicit dispositions toward goals and temptations. Because participants generated their own goals and temptations, these goals were relatively important to everyone, and the listed temptations were mostly attractive. To test whether implicit dispositions depend on people's experience of self-control conflict and, in particular, on whether people currently held a relevant overarching goal, in Study 2 we used experimenter-provided goals and temptations. In particular, with regard to the goal of weight loss, we expected to find a general tendency to pull weight-watching stimuli but push fatty food stimuli only among dieters (vs. nondieters).

In addition, whereas in Study 1 the generation of goal- and temptation-related stimuli primed the self-control conflict, which presumably triggered participants' predispositions toward these goals and temptations, in Study 2 we used a different procedure to prime a particular self-regulatory conflict regarding participants' diet. To ensure that participants viewed the present, experimentally provided set of stimuli in terms of conflicting motives, we replaced the lexical decision task, which required participants to sort goals and temptations into one category (of words), with a discrimination task that explicitly required participants to sort goals and temptations into two separate categories (goals vs. temptations).

Study 2: The Goal Dependency of Self-Control Dispositions

Dieters often experience an internal conflict between their natural tendency to enjoy fatty foods and their overarching goal to stay in shape. Whereas they would ordinarily approach food-related stimuli, over the course of exercising self-control, dieters come to associate these stimuli with avoidance responses and

associate fitness-related stimuli with approach responses. Using our joystick paradigm, we therefore expected to find that dieters would respond faster with pushing to food-related stimuli (e.g., *chocolate*) and with pulling to stimuli related to fitness (e.g., *thin*). In addition, because food stimuli are appealing to dieters, we expected these individuals to automatically pull food stimuli that they also pushed. Unlike dieters, nondieters do not experience goal conflict, and therefore they should be more likely to respond fast with pulling (approaching) to food-related stimuli (vs. fitness stimuli), which most people enjoy.

Method

Participants

Eighty-eight University of Chicago undergraduates (42 women and 46 men) participated in the experiment in return for a payment of \$7.

Procedure

In this study we used a Weight Watching (dieters vs. nondieters) \times Target (food vs. fitness) \times Response (pushing vs. pulling) mixed-subject design. Participants completed the procedure on desktop computers. The first part of the experiment included a series of questions regarding participants' lifestyle. The crucial item among these questions referred to participants' tendency to diet. Participants were simply asked to indicate whether they sometimes dieted (a yes/no question). To effectively conceal the purpose of the study and minimize demand effects on pursuing dieting goals, we used a single-item question to assess dieting orientation. In our pilot work, this single item effectively predicted scores on the Restraint Eating Scale (Polivy, Herman, & Warsh, 1978; $r = .44, p < .01$), and thus it was a reliable measure of dieting orientation. Participants who provided positive answers (52% of the sample) were classified as dieters—that is, as individuals who held the goal to lose weight.

The next part of the study included a joystick category judgment task, which was somewhat different from the lexical decision task presented in Study 1. Participants were presented with a series of target words, some of which were related to the category of fattening food, and some of which

were related to the category of fitness. Participants were asked to decide as quickly as possible whether each word was part of the category of fitness or food. Half of the participants were asked to pull the joystick toward them if the word was part of the category of food and push the joystick away from them if the word was part of the category of fitness. The rest of the participants completed the reverse configuration (pulling fitness targets and pushing food targets).

At the beginning of each trial, a fixation point appeared at the center of the screen for 300 ms and was then replaced by a target word, presented until the participants responded. Each trial was followed by a 700-ms pause before the next trial. After 6 practice trials (with equal numbers of food and fitness targets), participants commenced the main part of the task, which included 40 trials. Half of these trials presented targets related to fitness (e.g., *slim*, *shape*, *gym*, and *muscles*), whereas the rest of the trials presented targets related to fattening food (e.g., *chocolate*, *cake*, *sweets*, and *butter*). Each target word appeared twice. After completing this part of the task, participants were fully debriefed and dismissed. None of them were able to identify the purpose of the joystick category judgment task.

Results and Discussion

Manipulation Check

Twenty-seven University of Chicago undergraduates (18 women and 9 men) rated the perceived pleasantness of the fitness- and food-related targets (on 7-point scales). In support of the manipulation, fitness targets ($\alpha = .88$) and food-related targets ($\alpha = .87$) were similarly positive ($M_s = 5.07$ and 4.80), $t(25) = 0.57$, *ns*, and therefore differences in response times to these stimuli should not be attributed to their different affective value.

Self-Control Dispositions

All individual response times were first submitted to a natural log transformation, and only correct responses that did not exceed three standard deviations from the condition mean were used in subsequent analyses. There were more female than male dieters, and, when we controlled for any gender effects, a Weight Watch-

ing (dieters vs. nondieters) \times Target (food vs. fitness) \times Response (pushing vs. pulling) repeated measures MANOVA yielded the predicted three-way interaction, $F(1, 84) = 6.02$, $p < .05$. As illustrated in Figure 2, this interaction indicates a different pattern of results for dieters and nondieters. Dieters (i.e., those who held the goal to lose weight) were faster to push food-related targets ($M = 699.80$ ms) than fitness targets ($M = 782.50$ ms), $t(44) = 3.31$, $p < .01$. In addition, they were fast to pull fitness targets ($M = 725.89$ ms), which were not significantly different from food targets ($M = 719.96$ ms; $t < 1$), although responses for pulling fitness targets were faster than responses for pushing fitness targets, $t(44) = 2.21$, $p < .05$. A different pattern emerged for nondieters, who were similarly slow to push food-related targets ($M = 735.68$ ms) and fitness-related targets ($M = 763.79$ ms; $t < 1$) but were faster to pull food-related targets ($M = 686.70$ ms) than fitness targets ($M = 753.33$ ms), $t(40) = 2.60$, $p < .05$.

This pattern of results demonstrates that the implicit tendency to approach goals and avoid temptations requires that individuals hold a relevant long-term goal (in this case, the goal to diet). Whereas almost everyone enjoys high-calorie food, dieters wish to avoid it to stay in shape. Thus, dieters tended to automatically avoid food stimuli (fast pushing responses) and approach stimuli related to the fitness goal (fast pulling responses). It is interesting that dieters also approached the food stimuli that they avoided, a response pattern that indicates an original tendency to approach temptations, which is overridden by the tendency to avoid these stimuli. Such a pattern of approach-avoidance responses is further consistent with the Lewinian analysis of field forces (Lewin, 1935; Miller, 1944), which attests that a self-control dilemma emerges when some stimuli elicit equally prominent approach and avoidance behavioral tendencies.

The present study extends Study 1 by including a no-goal condition (i.e., nondieters). The no-goal participants provided automatic approach responses (fast pulling) to food stimuli rather than fitness stimuli (which they neither approached nor avoided).

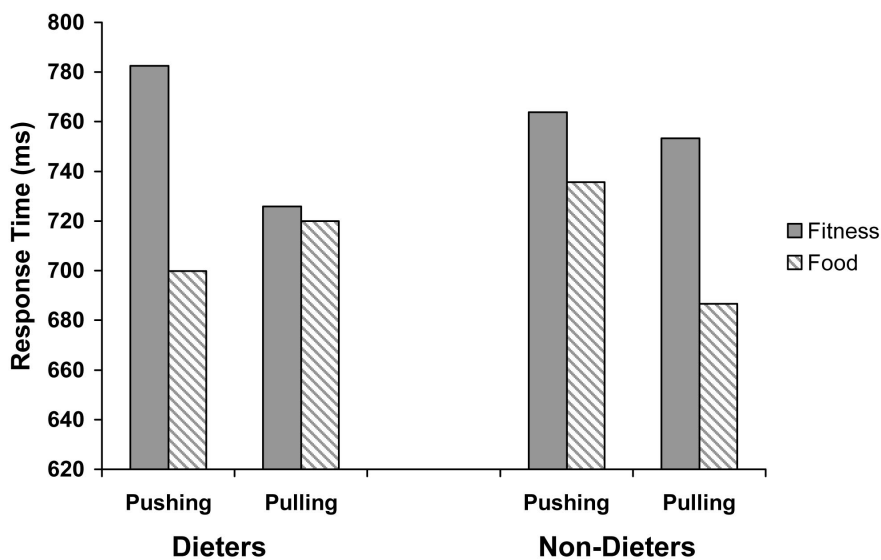


Figure 2. Response times for pushing versus pulling weight-watching targets and food-related targets as a function of weight-loss goal (Study 2).

This pattern reflects their underlying motivation to enjoy culinary delights and relatively little concern with keeping in shape. Thus, what constitutes a temptation for dieters is a legitimate, approachable goal for nondieters.

Whereas Study 2 demonstrates a tendency to approach goals and avoid temptations among individuals who experience self-control conflict, because they currently hold a goal that would be harmed if they indulged in the temptation, in our next study we seek to examine whether the strength of these self-control dispositions is further affected by the attractiveness of the temptations in question. On the basis of research on counteractive processes of self-control (Fishbach & Trope, 2005; Trope & Fishbach, 2000, 2005), we predicted that people would exercise self-control toward currently held goals when their pursuit was threatened by strong temptations. We therefore expected the tendency to avoid temptations and approach the overarching goals to increase with the perceived appeal of the temptation. It is important to note that this pattern should, in turn, reflect self-regulatory success. Accordingly, in Study 3 we test whether, for a highly committed academic goal, the strength of interfering temptations increases the manifestation of low-level approach and avoidance responses toward goal and temptation stimuli. Moreover, we also examine whether this pattern varies as function of individuals' general effectiveness at self-regulation. We expected to find this pattern among effective self-regulators but not ineffective ones.

Study 3: The Effect of Attractive Temptations Among Effective and Ineffective Self-Regulators

We expected that a predisposition toward approaching goals and avoiding temptations would vary as a function of the strength (i.e., attractiveness) of the temptation and of individual differences in self-regulatory effectiveness. In particular, effective self-regulators should demonstrate a greater tendency to approach goals and avoid temptations, and this difference should only be more evident when temptations are particularly strong. Indeed, although relatively weak temptations typically require little, if any, self-control to overcome, resisting relatively strong temptations may often necessitate efficient, preventative avoidance.

Thus, although the general attractiveness of even weak temptations typically links them to approach tendencies, effective self-regulators may link strong temptations to avoidance in an effort to counteract the threat of such distractors to self-control and goal pursuit. However, because ineffective self-regulators fail to counteract strong temptations, they should show only greater approach tendencies to stronger temptations (vs. weak temptations).

In Study 3, we examine these effects in a different domain from that examined in Study 2: students' academic goals and nonacademic temptations. We assumed that, unlike dieting, this domain would be more universally relevant to the participants in this study (all University of Chicago students) and, perhaps more important, that this domain might provide a greater range of possible temptations and greater variability in their actual attractiveness. Given how universally the goal of academic success is held among college students, we further assumed that students who are successful self-regulators should be fast to respond with pulling (i.e., approaching) when presented with academic stimuli (e.g., *studying*) and pushing (i.e., avoiding) when presented with nonacademic stimuli (e.g., *partying*). We predicted that the more students were

tempted to pursue nonacademic activities, the faster they should be to provide these self-control responses. Conversely, we predicted that unsuccessful students would not exert these implicit self-control responses, especially when the value of nonacademic activities was high.

Method

Participants

Fifty-seven University of Chicago undergraduates (32 women and 25 men) participated in the experiment in return for \$7.

Procedure

In this study we used a Value of Temptations \times Self-Regulatory Effectiveness within-subject design. Participants completed the procedure on desktop computers.

Perceived value of nonacademic activities and self-regulatory ability. The computer program first presented a series of questions that assessed perceived value of nonacademic activities and self-regulatory ability. We assessed the *perceived value of temptations* by asking participants to rate the attractiveness of pursuing different nonacademic activities during the winter break. The study was conducted a few weeks before the university's winter break, and we assumed that pursuing nonacademic activities during the winter break would not interfere with one's academic objectives; therefore, participants should be able to provide accurate evaluations of the true value of these activities for them in the absence of self-regulatory considerations. In particular, we asked participants to rate the extent to which they would enjoy pursuing 10 activities, such as chatting with friends, traveling, watching movies, and partying, during the break. They provided their ratings on 7-point scales (1 = *not at all enjoyable*, 7 = *extremely enjoyable*).

We assessed *perceived self-regulatory effectiveness* by asking participants to rate the extent to which (a) it was difficult for them to get good grades in their classes and (b) it was difficult for them to complete their coursework (both measures were reverse coded). These subtle measures of perceived success at accomplishing academic tasks have been shown to be reliable indexes of the self-regulatory effectiveness in the academic domain (e.g., Fishbach et al., 2003).

Joystick category judgment task. Next, we tested the degree to which participants avoided temptation stimuli and approached goal stimuli through a joystick category judgment procedure, similar in many respects to that used in Study 2. This time, however, we only tested for responses that were associated with exercising self-control: pulling goals and pushing temptations. That is, participants were presented with a series of target words, some of which represented academic goals (e.g., *school*, *library*, *college*, and *degree*), and some of which represented nonacademic temptations (e.g., *travel*, *movie*, *TV*, and *downtown*). Participants' task was to decide as quickly as possible whether each word was part of the category of *study*. They were specifically told that, for each word presented, they should pull the joystick toward them if the word was part of the category of *study* and push the joystick away from them if the word was not part of this category. The task included 6 practice trials, followed by 136 experimental trials, with an equal number of academic and nonacademic targets. After completing the joystick category judgment task, participants were fully debriefed and dismissed. None of them were able to identify correctly the purpose of the joystick task.

Results and Discussion

Manipulation Check

Twenty-nine University of Chicago undergraduates (15 women and 14 men) rated the perceived pleasantness of the academic ($\alpha =$

.89) and nonacademic ($\alpha = .79$) activities that were used as targets (on 7-point scales). Their ratings show that nonacademic activities were rated more favorably than academic activities ($M_s = 5.05$ and 4.21), $t(27) = 2.78, p = .01$. Whereas nonacademic activities were typically evaluated favorably, we predicted that effective self-regulators would nonetheless be predisposed to avoid these activities when they were in conflict with academic pursuits.

Self-Control Dispositions

The separate items assessing the value of nonacademic temptations ($\alpha = .63$) and perceived self-regulatory ability ($r = .65, p < .01$) were collapsed into unitary value and effectiveness scales, respectively. As in our prior studies, all individual response times were first transformed via a natural log transformation, with only correct responses less than three standard deviations from the mean included in subsequent analyses.

Although the analyses of the first two studies used MANOVAs, we conducted a series of regression analyses in the present study because of the continuous nature of our predictors. In particular, we conducted these analyses on response times for pulling academic stimuli and pushing nonacademic stimuli, and we included two continuous predictors, temptations' value and self-regulatory effectiveness, as well as their interaction (and controlled for gender effects).³ Beginning with response times for pulling academic targets, this analysis yielded a Value \times Effectiveness interaction ($\beta = -.29, t(52) = -2.10, p < .05$, indicating that effective (but not ineffective) self-regulators were faster to pull academic stimuli to the extent that they would enjoy pursuing nonacademic temptations. No main effect emerged in this analysis.

A second regression analysis, on times for pushing nonacademic temptations, yielded a similar Value \times Effectiveness interaction ($\beta = -.26, t(52) = 1.99, p = .05$, indicating that effective (but not ineffective) self-regulators were faster to push nonacademic stimuli to the extent that they would enjoy pursuing the related activities. This analysis also yielded a main effect for success ($\beta = -.26, t(52) = 2.00, p < .05$, indicating faster responses among more successful participants.

The relevant statistics are displayed in Figure 3. Following the suggestions of Aiken and West (1991), we present the response times predicted by the regression model to obtain at plus or minus one standard deviation from the means of the subjective value and perceived effectiveness scores. Analysis of the simple slopes revealed that effective and ineffective self-regulators provided different responses: For effective self-regulators, temptation attractiveness decreased response times for pushing temptations ($\beta = -.42, t(55) = -2.64, p = .01$, and pulling goals ($\beta = -.31, t(55) = -1.88, p = .06$). However, for ineffective self-regulators, if anything, temptation attractiveness was associated with somewhat longer response times for pushing temptations ($\beta = .08, t(55) = 0.40, ns$ (although note that the effect was not significant, probably because of the restricted range of academic ineffectiveness among college students), and, furthermore, it had no significant effect on pulling goals ($\beta < .01, t(55) = -0.32$).

The results of the present study extend the findings of the previous studies by demonstrating that self-control dispositions for approaching goals and avoiding temptations were moderated by both individuals' self-regulatory effectiveness and the extent of the threat posed by temptations. Thus, whereas our previous studies

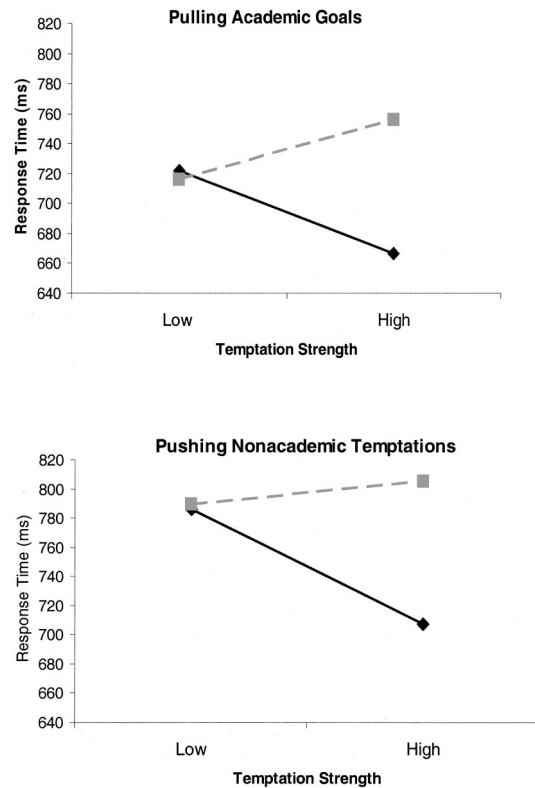


Figure 3. Response times for pulling academic targets and pushing nonacademic targets as a function of self-regulatory ability and perceived attractiveness of nonacademic targets (Study 3). Solid line = effective self-regulators; dotted line = ineffective self-regulators.

demonstrate that individuals may implicitly approach goals and avoid temptations and that these self-control dispositions require that one hold a relevant overarching goal, the present results further illustrate that these self-control dispositions also require that temptations be truly tempting: that they pose a legitimate threat to self-control. In this study, participants exhibited these predispositions to the extent that the temptations were explicitly rated as attractive. Moreover, effective and ineffective self-regulators exhibited quite different implicit patterns, which were further intensified by the degree to which the participants enjoyed procrastinating (i.e., in the absence of academic objectives). Apparently, procrastination cues motivate some people to study harder, but they also reduce the motivation to study among others.

In our next study, we seek to further clarify the demonstrated relation between self-control dispositions and self-regulatory effectiveness by more directly examining our assumption that these implicit response patterns promote effective self-regulation (an assumption that cannot be completely supported by the results of the previous studies because of their correlational designs). In particular, in this study we experimentally manipulate the strength

³ In Studies 3-4, we standardized each independent variable before computing interaction terms for the reported regression analyses. We simultaneously entered the standardized variables entered in the regression analyses with the interaction terms.

of participants' implicit predispositions to examine how this manipulation influences subsequent goal pursuit.

Additionally, the design of the next study also allows us to examine whether participants' chronic self-regulatory effectiveness (as assessed by their grade point average [GPA]) is predicted by individual differences in the speed with which participants pull goals and push temptations (as measured in one experimental condition) but not predicted by differences in the speed with which participants push goals and pull temptations (as measured in the other condition).

Study 4: The Implications of Self-Control Dispositions on Academic Pursuits

This study was set to more closely examine the possibility that implicit approach and avoidance responses to goals and temptations are not simply a characteristic of successful goal pursuit but may actually promote this success. That is, by asking undergraduate student participants to pull a joystick in response to academic stimuli and push a joystick in response to nonacademic stimuli (as opposed to the reverse configuration), we sought to enhance their subsequent intentions to study. Thus, just as approach and avoidance behaviors may have an implicit effect on how positively one evaluates attitude objects (e.g., Cacioppo et al., 1993), so may these proprioceptive cues provide regulatory feedback for how one perceives one's own goal pursuits.

In Study 4 we also sought to again examine whether the chronic activation of these response patterns (as indicated by response times) are related to long-term self-regulatory success, using a more objective measure of academic success: GPA scores. We expected fast response times for pulling academic goals and pushing nonacademic temptations to contribute to high GPA scores. Taken together, participants' immediate practice at implicit self-control should have an effect on their subsequent intentions to study, whereas the chronic activation of these response patterns should promote long-term academic success.

Method

Participants

Seventy-eight University of Chicago undergraduates (46 women and 32 men) participated in the experiment in return for \$7.

Procedure

This study used a self-control practice (yes vs. no) between-subjects design. Participants completed the procedure on desktop computers. The first part of the study estimated academic success. Participants were asked to list their average GPA during the last academic quarter. To conceal the purpose of this measure, we embedded it within other irrelevant questions regarding participants' general lifestyle and personal goals (e.g., how successful they were at saving money).

Joystick category judgment task. The second part of the study included a joystick category judgment task similar to the one used in Study 3. This task was designed to manipulate the strength of association between goal-related stimuli and approach responses and between temptation-related stimuli and avoidance responses. As in Study 3, participants were presented with a series of academic and nonacademic words. Half of the participants, who were assigned to the self-control practice, were asked to pull a joystick toward them if the word was part of the category of *study*

and push a joystick away from them if the word was not part of this category. The rest of the participants were asked to push a joystick away from them if the word was part of the category of *study* and pull a joystick toward them if the word was not part of this category. This task included 136 trials (preceded by 6 practice trials) with equal numbers of academic and nonacademic targets.

Behavioral intentions. Following the category judgment task, participants were asked to estimate how much time (in minutes) they planned to invest in their homework that day. This item, too, was embedded within other, irrelevant questions. Participants were then fully debriefed and dismissed. In their debriefing, none of the participants were able to identify the purpose of the joystick task.

Results and Discussion

Self-Control Dispositions

All individual response times were first submitted to a natural log transformation, and only correct responses that did not exceed three standard deviations from the condition mean were then used in subsequent analyses. To explore the effect of implicit dispositions on academic performance, we tested for the relation between participants' GPA scores and their response times on the category judgment task. That is, a regression analysis examined participants' total mean response time on the category judgment task as a function of their GPA and experimental condition and, consistent with the previous analyses, also controlled for the effect of gender.

We predicted that participants' GPA would be positively related to their response times, but only when they were asked to pull goals and push temptation, not when they were asked to do the reverse. Consistent with this prediction, we found that whereas participants' GPA had an effect on their response time overall ($\beta = -.32$), $t(70) = 2.89$, $p < .01$, this effect was significantly stronger in the pull-goals/push-temptations condition, as indicated by the two-way interaction ($\beta = .23$), $t(70) = 2.01$, $p < .05$. No other effects emerged in this analysis.

Examining the effect of GPA separately in both experimental conditions, we found that GPA was negatively related to response times when participants were asked to pull goals and push temptations ($\beta = -.52$), $t(35) = 3.11$, $p < .01$, but not when participants were asked to push goals and pull temptations ($\beta = -.19$), $t(35) = 1.18$, *ns*. Thus, high GPA scores were associated with fast responses on pull-goal and push-temptation trials.

Behavioral Intentions

Next, we tested for the effect of our manipulation on intentions to study. To lessen the influence of outliers, we transformed the amount of time participants were planning to spend on their homework using a natural log transformation and analyzed it as a function of experimental condition. In line with our hypothesis, participants were planning to spend more time on their homework after completing the version of the task that included pulling academic goals and pushing nonacademic temptations ($M = 201.12$ min) than after completing the version of the task with the reverse configuration ($M = 131.86$ min), $t(76) = 2.75$, $p < .01$. Responding with approaching (pulling) academic goals and avoiding (pushing) procrastinations was thus an effective means to induce greater intention to study.

This effect demonstrates some of the immediate implications of developing a predisposition toward approaching goals and avoid-

ing temptations, namely, that it increases the immediate tendency to pursue the relevant goal. In addition, these predispositions seem to have long-term implications for academic success, as indicated by the correlation with participants' GPA scores. However, the effect of the manipulation is limited to behavioral intentions, as we were unable to determine whether participants actually spent more time on their homework following the experimental session. Our final study was therefore designed to explore the effect of practicing self-control dispositions on actual choice. With regard to the goal of dieting, we predicted that practicing self-control dispositions would affect choice of a healthy versus a tasty snack.

Study 5: The Implication of Self-Control Dispositions on Food Choice

Our final study was designed to replicate Study 4 in the domain of dieting and food choice. We sought to demonstrate that pulling a joystick in response to healthy food stimuli and pushing a joystick in response to unhealthy food stimuli (as opposed to the opposite configuration) increases subsequent choice of healthy food.

Method

Participants

Twenty-four University of Chicago undergraduates participated in the experiment in return for \$5. On the basis of our previous results that female undergraduates were generally more aware of their food intake and concerned with their weight (see also Fishbach et al., 2003), we decided to include only female participants in this study.

Procedure

This study used a self-control practice (yes vs. no) between-subjects design. It included a joystick category judgment task, similar to the one used in Study 4, and was completed on desktop computers. The task manipulated the strength of association between goal-related stimuli and approach responses and between temptation-related stimuli and avoidance responses. Participants were presented with a series of food-related word targets, some of which were related to the category of *healthy* (e.g., *apple*, *broccoli*, *yogurt*), and some of which were related to the category *tasty* (e.g., *cookie*, *cake*, *fries*).

Half of the participants in the self-control practice were asked to pull a joystick toward them if the word was part of the category *healthy* and push a joystick away from them if the word was part of the category *tasty*. The rest of the participants were asked to push a joystick away from them if the word was part of the category of healthy and pull a joystick toward them if the word was not part of this category. The task included 120 trials (preceded by 6 practice trials) with equal numbers of *healthy* targets and *tasty* targets.

On completion of the joystick categorization task, participants were handed another food preference survey, which asked them to choose among different foods. This survey included three sets of photos of popular food items, each containing one item that is considered healthy and one item that is considered fatty (a yogurt and a chocolate bar, a fruit salad and chocolate chip cookies, and an apple and a bag of chips). Participants had to select one item in each set and were told that one of their choices would be randomly selected to be available for them by the end of the experiment. On completion of the survey, participants were given a pack of cookies or a bowl of fruit salad, depending on their choice on the second set. They were then fully debriefed and dismissed. In their debriefing, none of the participants were able to identify correctly the purpose of the joystick task.

Results and Discussion

The number of healthy items that participants chose as a parting gift (between zero and three) was analyzed as a function of experimental condition. In line with our hypothesis, participants were more interested in healthy items after completing the self-control version of the task, which included pulling healthy targets and pushing tasty targets ($M = 2.14$), than after completing the second version of the task, which had the reverse configuration ($M = 1.40$), $t(22) = 2.24$, $p < .05$. Thus, consistent with the results of Study 4, responding with approaching (pulling) goals and avoiding (pushing) temptations was an effective means to induce greater adherence to a long-term goal. That is, manipulating the dispositions that participants held with respect to tempting food and dieting objectives was shown to directly affect the selection of healthy (vs. unhealthy) food items in a subsequent choice situation.

General Discussion

In the course of exercising self-control, individuals often choose to keep certain objects out of sight and far from reach and to maintain close physical distance to other objects that are closely associated with their long-term interests (Ainslie, 1992; Rachlin & Green, 1972; Schelling, 1984; Thaler & Shefrin, 1981; Wertebroch, 1998). For example, forecasting the self-control conflict that the presence of cigarettes, alcohol, or culinary delights may elicit, some people choose to eliminate these stimuli from their immediate environment to secure the pursuit of a healthy lifestyle. This self-control tactic naturally involves the operation of meta-cognitive planning processes. Our current investigation was designed to investigate whether similar preventive operations may importantly involve implicit processes of approaching goals and avoiding temptations.

Recent research on automatic goal pursuit has provided compelling evidence for the role of implicit processes in self-regulation (Aarts & Dijksterhuis, 2000; Bargh, Gollwitzer, Lee-Chai, Barn-dollar, & Troetschel, 2001; Kruglanski et al., 2002; Moskowitz et al., 1999; Shah & Kruglanski, 2003). Much of this research has demonstrated that different environmental cues facilitate the activation of goal-related concepts, which then elicit consistent choice of actions. Our current investigation adopts this general perspective but deviates from it in two important ways: First, we suggest that implicit responses, which are triggered by environmental cues, may subsequently counteract the immediate effect of these cues. Thus, individuals' implicit avoidance and approach responses often reflect their long-term interests, which do not correspond to the immediate value of the situational primes. In particular, over the course of exercising self-control, individuals implicitly avoid stimuli with positive short-term value and approach stimuli with negative short-term value. Second, whereas previous research on automatic goal activation has mainly focused on the semantic activation of personal goals and the related means, the current investigation explores how proprioceptive cues may implicitly affect goal pursuit, further highlighting the importance of considering embodied cognition, in which one's cognitive (and, in this case, regulatory) processes are intricately tied with the body's interaction with the world (see M. Wilson, 2002).

Four specific hypotheses follow from our theoretical analysis and are examined in this research. First, using a joystick paradigm

meant to simulate basic approach and avoidance responses (see Duckworth et al., 2002; Markman & Brendl, 2005; Solarz, 1960), we predicted that individuals should be more likely to approach goal-related concepts and avoid temptation-related concepts. Second, we predicted that this response pattern would be conditioned on the presence of self-control conflict and thus require that individuals currently hold a long-term goal that would potentially be hindered if they indulged in the given temptation. Third, we expected that the extent of self-control conflict (and self-control responses) would further depend on the strength of the temptation, such that attractive (and thus more threatening) temptations create relatively more conflict than relatively unattractive temptations. Finally, we expected that, although self-control conflict is a prerequisite for the implicit response pattern we have described, the extent to which this conflict elicits this implicit response pattern would vary as a function of individual differences in self-regulatory effectiveness and, moreover, that manipulating these predispositions through practice would increase the effectiveness of subsequent self-regulation.

In support of the aforementioned hypotheses, in Study 1 we found that individuals were relatively faster to respond via pulling to goal-related concepts (vs. control and temptation concepts) and relatively faster to push temptation-related concepts (vs. control and goal-related concepts). Study 2 established the role of an overarching goal, as only dieters (vs. nondieters) were predisposed to approach fitness-related concepts and avoid fatty food-related concepts (which they also approached). We assumed that dieters avoid food temptations to counteract their initial tendency to approach these stimuli. Accordingly, people who were not trying to lose weight were predisposed to approach food stimuli, but they did not avoid these stimuli and were indifferent toward fitness stimuli, which they neither approached nor avoided.

In Study 3 we then tested for the effect of temptation attractiveness. With respect to academic goals and temptations (e.g., studying and watching TV), we found that effective self-regulators were fast to push nonacademic activities and, independently, to pull academic concepts, to the extent that they found those tempting alternatives to be attractive. The activation of implicit behavioral dispositions toward goal and temptation stimuli was directly related to the perceived short-term value of temptation-related stimuli—the more attractive such stimuli were, the faster effective self-regulators were to retrieve the appropriate response. That strong temptations elicited more pronounced avoidance responses further demonstrates that implicit self-control responses are flexible and context dependent. Indeed, it was only in the presence of overarching goals that (originally positive) temptations elicited avoidance responses.

Studies 4–5 were designed to more closely examine the effect of implicit predispositions toward goals and temptations on self-regulatory success. This relation was evident first with subjective assessment of self-regulatory ability (in Study 3) and then with objective measure (i.e., GPA scores in Study 4). Studies 4–5 further demonstrate the direct effect of implicit behavioral dispositions on continued adherence to long-term interests. That is, participants in Study 4 who were asked to pull academic-related concepts and push nonacademic concepts (as opposed to the reverse configuration) increased their intentions to study. Participants in Study 5 who were asked to pull healthy food-related targets and push unhealthy targets (as opposed to the reverse

configuration) were more likely to choose a healthy (over a fatty) snack in a subsequent task.

Explicit and Implicit Self-Control

Taken together, our findings have implications for the distinction between explicit and implicit self-control operations. Previous research on self-control has mainly investigated relatively high-level mechanisms, which were more likely to break down under limited mental resources, including conditions of emotional stress or cognitive load or following self-control exertion (e.g., Aspinwall & Taylor, 1997; Baumeister et al., 1998; Muraven & Baumeister, 2000; Trope & Neter, 1994). Unlike explicit self-control operations, implicit operations are far less resource dependent and thus may be relatively more resistant to the detrimental effects of stress or mental and physical fatigue. These implicit operations may then serve as a backup to explicit processes, allowing people to successfully pursue their long-term interests under conditions of limited resources. Moreover, the greater efficiency of such implicit operations may also help individuals to quickly counteract (or avoid) tempting objects or situations that spontaneously appear in their everyday environment (e.g., when a colleague unexpectedly brings in donuts or invites one to a movie). Implicit self-control, then, may serve an important preventative function by helping individuals to steer clear of temptations before actively engaging with them.

Explicit forms of self-control, however, may be important for different reasons. Indeed, this type of self-control may serve more a remedial purpose in allowing individuals to strategically diminish the effect of an experienced temptation or possibility over time, and with repeated practice, explicit and deliberate self-control strategies (e.g., those involving approach and avoidance) may become automatic. Thus, individuals' explicit and implicit mechanisms of self-control may predict different facets of self-control effectiveness and failure in much the same way as their implicit and explicit attitudes and stereotypes may predict different aspects of prejudice and social behavior (Dovidio, Kawakami, & Gaertner, 2002).

Future research will explore such intriguing possibilities and more closely examine the relation of explicit and implicit self-control, although this relation may ultimately prove to be complex. Indeed, just as the relation between explicit and implicit measures of attitudes has often been found to be inconsistent (see Blair, 2001; Boniecki & Jacks, 2002; Dovidio, Kawakami, & Beach, 2001; T. D. Wilson, Lindsey, & Schooler, 2000), so might the relation between explicit and implicit forms of self-control be limited, possibly by the different self-regulatory functions they serve (as we have discussed) and the different ways they are affected by motivational or situational factors.

Everything Has Its Season: The Flexibility of Automatic Operations

Our research supports the idea that automatic evaluations of different objects tend to be context dependent (Ferguson & Bargh, 2004). Thus, what constitutes a legitimate personal goal under some circumstances is framed as an interfering temptation at other times. For instance, a desire to go on a relaxing vacation is legitimate on some occasions but should be withheld on other

times, when important deadlines at work are approaching. The relativity of goals within goal systems has some important implications for the nature of self-control, which, to be effective, should facilitate the pursuit of dynamic motivational states.

Our studies provide some initial demonstrations for the flexibility of implicit self-control responses (see also Hassin, 2005). That is, in Study 1, participants avoided tempting activities that were considered positive in the short-term, and in Study 2, dieting participants avoided common food temptations that were meant to be consistently desirable. Furthermore, in Study 3, participants' tendency to avoid some activities increased in direct proportion to the positive valence of these activities in the absence of an overarching goal. Thus, successful self-regulators appear to be most likely to implicitly avoid the very activities they might find most attractive in nonacademic settings (e.g., over a break between semesters).

In general, there may be a distinct self-regulatory advantage for exhibiting efficient and flexible approach and avoidance responses, as what may represent a temptation one day may be one's primary goal the next. That is, in the absence of overarching goals, it may be more adaptive to approach momentarily allurements, thereby taking advantage of the opportunity to enjoy the moment. Our present findings suggest that people respond to their goals and temptations not in isolation but rather with respect to each other as well as to their present self-regulatory context. Thus, although they unfold efficiently, implicit mechanisms of self-control do not unfold indiscriminately, and future research will more thoroughly examine how they are effectively and efficiently used in the service of people's ever-changing goals and ambitions.

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