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The Shifting Preference for Contingent Rewards in Goal Pursuit

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This research explored a dynamic self-control process and examined people's preference for contingent rewards during and after the completion of an active focal task. We found that during the completion of such a task, people tend to prefer choice options that undermine their chronic goals as postcompletion rewards. However, by the time that people have completed the focal task and obtained the rewards that they had desired, these options seem less attractive because the chronic goals, which were inhibited by the focal task when people craved the reward, have rebounded in priority. The choice of a chronic-goal-violating reward further provides motivation during people's focal task, and the later switch after the completion of the focal task helps people to get back on track in terms of their pursuit of the chronic goal. We then discuss the implications of the results for understanding time-inconsistent preferences, adaptive self-regulation, goal-based valuations, and the dynamic nature of temptations.

Keywords: reward, temptation, goal, preference, self-regulation

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Close your eyes and think for a moment: how many times have you promised yourself something nice as a reward when you are in the middle of a demanding task? Again, think about how many times, when you have finally labored through the arduous task and reached the point at which you can fulfill the promise that you made to yourself, you have realized that you did not particularly want the reward and decided to take a pass?

It happens to all of us. In the pursuit of a demanding goal, people often think of an additional short-term reward to help increase their momentary motivation (Ainslie, 1975; Rachlin, 2000). For example, researchers often think of a relaxing trip to the beach as a reward for a semester's difficult work when school gets busy, and students make plans to indulge in a nice dinner when pulling those drowsy all-nighters before exams. These rewards, however, often go unrealized once people have successfully attained their goals.

A large body of research has documented both how rewards facilitate goal pursuit (Berridge, 2000; Mahoney, 1974; Pessiglione et al., 2007) and the effectiveness of these incentives (Cameron & Pierce, 1994; Carver & White, 1994; Enzle, Roggeveen, & Look, 1991; Mischel & Moore, 1973). These works have largely treated contingent rewards as additional incentives that individuals choose spontaneously. However, what remains unclear is how these options become attractive at that particular moment and, once people reach the point when they can finally enjoy them, whether and how these rewards are consumed. In the current research, we investigate a preference shift in contingent rewards during and after the accomplishment of a demanding task and propose a dynamic self-control mechanism to closely examine these contingent rewards.

We draw from the literature on multiple goal pursuit (Chun, Kruglanski, Sleeth-Keppler, & Friedman, 2011; Kruglanski et al., 2002; Louro, Pieters, & Zeelenberg, 2007) and distinguish between a focal task and a chronic background goal. We define a focal task as a task that a person is actively pursuing at the moment and a background goal as a chronic goal that a person holds but that is temporarily considered a lower priority because of one's active engagement in the focal task (Shah, Friedman, & Kruglanski, 2002). For example, when a dieter attempts to complete an overdue assignment, the assignment completion represents the focal task and pushes the chronic dieting goal into the background.

We propose that the dynamic relationships between a focal task and chronic goals have important implications for individuals' choice of a contingent reward. Specifically, the active engagement in a focal task increases the preference for choice items that violate people's chronic goals as contingent rewards. However, the completion of the focal task leads to the devaluation of these chosen items and, therefore, decreases the likelihood of actually consuming them. For example, we expect that a person who holds a savings goal becomes more likely to think of rewarding himself with an expensive splurge when completing a demanding task. However, the same person's likelihood of exercising this reward decreases once the pressing task has been accomplished, even though he or she had genuinely planned to indulge. We further expect that the shifting preference for contingent rewards during and after the focal task functions as an adaptive self-regulation

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mechanism that may help people maintain their multiple goal pursuit.

The remainder of this article is organized as follows. We first review the research that leads to our predictions that people's preference for choice options that undermine their chronic goals increases during the completion of a focal task and decreases after the focal task is accomplished. We then report five studies. The first four studies vary the status of the focal and chronic goals and assess how individuals' preferences for rewards change over time. The final study examines the motivational consequences of different rewards during the focal task.

Conceptual Development

Contingent Reward

Individuals engage in goal-directed actions to achieve a desirable end state (Austin & Vancouver, 1996; Carver & Scheier, 2001). Although these actions are ultimately motivated by the end state, the hyperbolic discounting of the outcome in the distant future may make the present pursuit difficult (Ainslie & Haslam, 1992; O'Donoghue & Rabin, 1999). For example, although having a fit body is highly desirable, the outcome might be too distant in the future and too abstract to motivate treadmill use at the moment.

To help ensure successful attainment of a goal, people often set up rewards that are contingent on the successful performance of the present goal-directed actions (Ainslie, 1975; Brickman, Abbey, & Halman, 1987; Thaler & Shefrin, 1981; Trope & Fishbach, 2000). In theory, the postcompletion rewards link people's present goal-directed actions to incentives that go beyond the ultimate desirable outcome (e.g., Bandura & Perloff, 1967; Mahoney, 1974; Mischel & Ebbesen, 1970). For example, people plan to open a bottle of good wine when they finish writing a paper, students dwell on the hope of a beach vacation after upcoming final exams, and children learn to reward themselves with a handful of candy after achieving self-determined criteria in a miniature bowling game (Bandura & Whalen, 1966).

In theory, these contingent rewards add value to present goal-directed actions (Locke, 1968; Locke, Shaw, Saari, & Latham, 1981). By incorporating extra rewards, these goal-directed actions are associated with not only the benefits of the ultimate outcome but also the additional payoffs, which make these actions more likely to be completed (Latham & Locke, 1991). Although, theoretically, any desirable option may function as a reward, what we are interested in is how people's choice of a contingent reward might be influenced by the dynamics of goal activation and, more specifically, what they would choose when the present task inhibits their chronic goals.

Dynamics of Goal Activation and Valuation

Rather than having a single goal in mind, people often simultaneously pursue multiple goals (Chun et al., 2011; Kruglanski et al., 2002; Louro et al., 2007), all of which involve a set of facilitative and inhibitory actions (Fishbach, Friedman, & Kruglanski, 2003; Förster, Liberman, & Higgins, 2005; Shah et al., 2002; Shah & Kruglanski, 2002). For example, a student might want to achieve academic excellence and to stay in shape, and a young father tries to work hard while also spending more time with his child.

One important feature of these simultaneous goals is that they are inhibitory to each other, and when individuals are actively engaged in the pursuit of one goal, it automatically inhibits others (Bélanger, Lafrenière, Vallerand, & Kruglanski, 2013; Shah et al., 2002; Shah & Kruglanski, 2002). For example, for a person who holds the goals of being beautiful and being intelligent, activation of the beauty goal automatically suppresses the goal of being intelligent, as evidenced by a delayed response to the attribute of intelligence (Shah et al., 2002). Similarly, activating an eating enjoyment goal decreases the accessibility of weight control goals (Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008).

More important, the inhibition depends on the status of the active goal, and whenever it is accomplished, it ceases to inhibit others, allowing the inhibited goals to quickly rebound and regain priority (Liberman & Förster, 2000; Macrae, Bodenhausen, Milne, & Jetten, 1994; Martin, Tesser, & McIntosh, 1993). Therefore, the achievement of a focal goal leads to the release of this goal and the subsequent pursuit of the previously inhibited chronic goals (Laran, 2010).

The dynamic activations and inhibitions of goals lead to shifts in the value of the options that are related to those goals (Brendl & Higgins, 1996; Brendl, Markman, & Messner, 2003; Ferguson & Bargh, 2004; Fitzsimons & Shah, 2008; Markman & Brendl, 2000; Moors & De Houwer, 2001). When a goal is active, desirable options that violate this goal (i.e., temptations) are devalued (Fishbach, Zhang, & Trope, 2010; Milyavskaya, Inzlicht, Hope, & Koestner, 2015; Myrseth, Fishbach, & Trope, 2009). However, whenever this goal is inhibited by others, these temptations are no longer devalued and, because of the usual deprivation, should emerge to be particularly attractive (Fedoroff, Polivy, & Herman, 1997). For example, whenever an active task (e.g., trying to finish an overdue assignment) inhibits the dieting goal, the aforementioned dieter no longer devalues potato chips. In particular, because these temptations are usually resisted, they may appear even more attractive than other pleasurable options that one does not usually avoid.

Goal Activation and Choice of Contingent Reward

The dynamics of goal activation should have important implications for an individual's choice of contingent rewards. Whenever a person is actively engaged in a focal task, it inhibits other chronic goals, and self-control in relation to the chronic goals ceases to devalue the temptations that violate them. As a result, the person should experience increased valuation of the temptations, and in turn an increased likelihood of choosing these temptations as the contingent reward whenever an opportunity arises.

If people prefer temptations as rewards because the active focal task inhibits the chronic goals, we should expect that the preference for such items should be positively correlated with the strength of the inhibited chronic goals; that is, the more committed one is to a chronic goal, the more likely he or she is to choose temptations that violate it as the reward when this goal is inhibited. This ironic effect occurs because the stronger a person's chronic goal is, the more frequently he or she resists this inherently attractive choice (Rachlin, 2000; Stroebe et al., 2008), making it even more attractive and preferred whenever the self-control

ceases to operate. For example, compared with a casual dieter who refuses cheesecake only occasionally, a committed dieter who more religiously turns down this sweet temptation should devalue this tempting treat to a greater extent under normal circumstances (Fishbach et al., 2010; Myrseth et al., 2009). Whenever the dieting goal is inhibited, however, this committed person should crave the cake even more (Erskine & Georgiou, 2010; Papies, Stroebe, & Aarts, 2008).

However, what people often fail to expect is that, by the time they have successfully accomplished the focal task, the previously inhibited chronic goal will become active again and quickly devalue the temptations that violate this goal (Fishbach et al., 2010; Myrseth et al., 2009). This rebounded chronic goal, therefore, diminishes the appeal of the previously attractive temptations that people have chosen for themselves. For example, consider the aforementioned dieter who dreams of having ice cream after an exam when the focal task of studying for the exam is active. When the exam is finished, the previously inhibited dieting goal becomes active again and decreases the person's willingness to enjoy the ice cream. We should then expect that when the focal task is accomplished, the more an individual is committed to a chronic goal, the less likely this person is going to consume the chronic-goal-violating reward that he or she has chosen.

More important, this shift in preference during and after the focal task may function as an adaptive self-regulation mechanism that offers instrumentality for both the focal task and the chronic goal. During the focal task, people choose the chronic-goal-violating temptation as a contingent reward, and the expectation of consuming this temptation adds value to the actions that facilitate the present task, resulting in a greater likelihood of completing the task. The temptation, however, may not ultimately be exercised when the focal task is accomplished, which ensures that the chronic goal is also protected. By strategically (but not necessarily intentionally) violating and resuming their chronic goal, people manage to maximize the incentive for their focal task without hurting their long-term goals.

The Present Research

The present research examines individuals' preference shift in the choice of contingent rewards and its instrumentality in dynamic self-regulation. Study 1 demonstrates that people's preference for the option that undermines their chronic goal shifts during and after the completion of a focal task. Study 2 explores whether people present the same behavioral pattern when a focal task has not yet been initiated. Study 3 examines whether this preference shift is chronic-goal-specific in a situation with multiple chronic goals. Study 4 experimentally increases the activation level of the chronic goal and investigates whether this manipulation affects people's preference for a chronic-goal-violating reward during a focal task. Finally, Study 5 manipulates individuals' dieting goal and tests whether a dieting-goal-violating reward is more motivating than a control reward during a focal task for people with an enhanced dieting goal.

Study 1

In Study 1, participants chose their postcompletion contingent reward in the middle of a 1-week focal task and then did so again after they completed the entire focal task. We examine whether people prefer the option that violates their chronic dieting goal more when the focal task is active than when they have completed the focal task.

Method

Participants and design. Three days before the experiment, we recruited participants on the website of a large public university in China to join a 1-week survey in exchange for cash compensation. To determine the sample size in each condition, we conducted a prior power analysis for a two-tailed z test for a single logistic regression coefficient of chronic goal strength using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009). We set the statistical power to .80 and the baseline probability of choosing the cheesecake voucher to .60, and we assumed a normal distribution for the chronic goal strength. The analysis revealed a minimum sample size of 84 in each condition to detect a significant effect of chronic goal strength on reward choice (α level of .05), assuming a small-to-medium effect size (OR) of 2.0. Given our within-subject design and the traditionally low completion rate for multiple-day tasks, we targeted a minimum total sample of 84 but tried to recruit as many participants as we could within a 3-day period. We preregistered our data collection and analysis plan at https://osf.io/dbcjf/.

There were 219 participants (72 men and 147 women, with an average age of 21.9) registered for the survey. Sixty-five of them did not start the survey at all, and 11 dropped out during the experiment. After choosing the reward in the middle of the survey, the dropout rate did not differ between different reward choosers (4.5% (4/89) $_{\text{cheesecake}}$ vs. 7.9% (5/63) $_{\text{movie}}$, $\chi^2 = 0.76$, $p = .376$). A total of 143 participants (45 men and 98 women, with an average age of 20.9) ultimately completed the 1-week survey and were included in the following analyses. This study used a focal task status (active vs. completed) $\times$ chronic dieting goal strength mixed design, with the focal task status manipulated as a within-subject factor and the strength of participants' dieting goal measured as an individual difference factor. The dependent variable was the rate at which the participants chose cheesecake, a typical food item that violates dieting goals (Milyavskaya et al., 2015).

Procedure. Participants were recruited to complete a 1-week survey that professed to assess their "emotional experiences throughout a week." The original materials were in Chinese. The survey required a preregistration procedure. On the registration page, we informed the participants that they would receive compensation only if they successfully completed the entire task. Participants then responded to some demographic and lifestyle questions (e.g., "To what extent do you frequent the school dining hall?", 1 = *not at all* to 7 = *extremely*) if they agreed to participate. Among these questions, we measured the strength of their chronic dieting goal ("To what extent are you concerned about being slim?", 1 = *not at all* to 7 = *extremely*). The registration page was taken down at midnight on the third recruiting day, and the focal survey began at 10:00 p.m. the next day.

Every night at 10:00 p.m., the registered participants would receive a text message containing the survey link for that day. Each daily link expired in 24 h, and they were required to log in and indicate their daily activities and emotional experiences for seven consecutive days (e.g., "How many tweets have you posted to-

day?"; "To what extent have you felt happy today?", see the online supplemental materials for details). After finishing the third day's survey, they were offered an extra reward for completing the entire task. The choice was either a voucher for a cheesecake or a voucher for a movie rental. We emphasized that these two vouchers were of equal monetary value and that the participants would receive the voucher only if they successfully completed the task. The participants then made their choices.

After completing the seventh day's survey (the entire task), all participants were informed that they were about to receive the reward that they selected during the task. At that point, we also told them that they needed to confirm their choice and that if they had changed their mind, they could indicate their new choice. We then presented the participants with the same two vouchers and asked them to make their final choice. All participants received the voucher of their choice and monetary compensation within 1 week after they finished the entire survey.

Results and Discussion

We conducted a mixed logistic regression analysis with the repeated measure on participants' choice of the voucher (0 = movie, 1 = cheesecake) using the focal task status (−1 = active, 1 = completed, within-subject factor), the strength of their dieting goal (individual difference measure) and their interaction term as predictors (mean-centered). The analysis yielded a Focal Task Status × Dieting Goal Strength interaction, $B = -0.29$, Wald's $\chi^2(1) = 15.08$, $p < .001$. No main effects emerged here (the status of focal task, $B = -0.14$, Wald $\chi^2(1) = 2.36$, $p = .125$; the strength of dieting goal, $B = 0.06$, Wald $\chi^2(1) = 0.35$, $p = .556$). Specifically, the simple slope analyses revealed that when the participants were in the process of completing the week-long survey, the strength of their dieting goal positively predicted their rate of choosing the cheesecake voucher, $B = 0.35$, Wald's $\chi^2(1) = 8.54$, $p = .003$, indicating that the more one is pressured by dieting concerns, the more likely he or she is to choose a cheesecake while a different focal task is ongoing. However, for the same group of participants, once the focal task had been completed, dieting goal strength negatively predicted the rate at which the participants chose the cheesecake voucher, $B = -0.24$, Wald's $\chi^2(1) = 4.41$, $p = .036$, suggesting that once the more urgent focal task had been completed, participants with dieting concerns exhibited less interest in consuming a fatty cheesecake; see Figure 1. For the other comparison in this two-way interaction, see the online supplemental materials for additional analyses using the Johnson-Neyman technique.

We were particularly interested in participants who switched from one option to the other. Of the 143 participants, 30.1% (N = 43) altered their choices: 27 participants switched from the cheesecake to the movie voucher, and 14 switched the other way. We coded those who initially chose the cheesecake voucher but switched to the movie voucher as "1" and the others as "0." We then ran a logistic regression on the switching behavior with dieting goal strength and found that dieting goal strength positively predicted the choice switch, $B = 0.65$, Wald's $\chi^2(1) = 15.10$, $p < .001$. The greater the participants were concerned about being slim, the more likely they were to first choose a fatty cheesecake and later alter their decision.

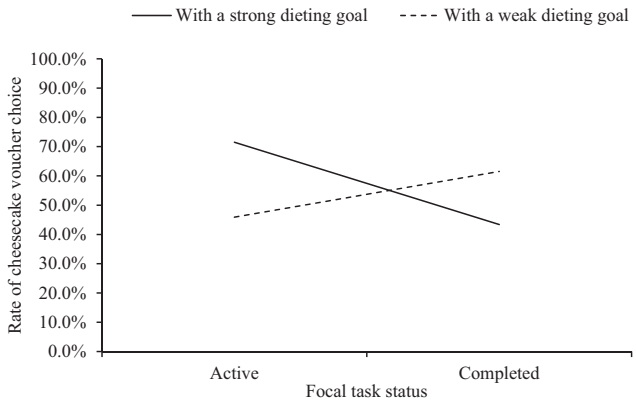

Figure 1. Rate of the cheesecake choice as a function of focal task status and dieting goal strength (Study 1). The rates of cheesecake voucher choice were computed by inserting 1 *SD* above and below the mean dieting goal strength into the regression.

The results from this study support our hypothesis that during the completion of a pressing focal task, people become more likely to choose the option that violates their chronic goal than when they have completed the focal task. This study also helps to address a possible explanation for why dieters are more likely to choose cheesecake as a reward during a focal task than after it, which is simply because their ability to avoid goal-violating temptations is diminished by depletion (Muraven, Tice, & Baumeister, 1998). If this is the case, they should, therefore, be more likely to yield to a temptation after working on an entire task (i.e., greater depletion) rather than after finishing only half of it. Instead, our results showed the opposite pattern, indicating that dieters are more likely to choose a goal-violating option before (vs. after) completing an entire task. This pattern suggests that depletion may not be the likely cause.

One concern in this study is the relatively low switching rate. We attribute this low switching rate to the robust status quo bias, particularly for people who needed to make two consecutive choices within a short period of time. Despite this large main effect, we still observed that people made the switch in a conservative test (a within-subject, repeated choice paradigm) and that their tendency to switch was positively correlated with the strength of the chronic dieting goal, showing that people's choice and switch of a tempting reward are driven by the changing status of the chronic goal.

We attribute this preference shift to the changing dynamics between the chronic goal and the focal task. When an active task inhibits people's chronic goal, the previously devalued temptations become attractive rewards; however, once this focal task becomes inactive, the chronic goal becomes active again and renders the temptations less attractive. If this is indeed the case, the preference for a chronic-goal-violating reward should depend solely on whether one is actively engaged in the focal task, and the same temptation avoidance should occur before the initiation of the focal task. By demonstrating that people are more likely to avoid these guilty pleasures both before and after the focal task (than during the focal task), we can more confidently attribute the midtask increase of the preference for these tempting items to the engagement in the focal task.

Study 2

In this study, participants performed a mathematical task and were offered a reward either before the task began or while the task was ongoing. We explore whether an active focal task increases the rate at which participants choose a reward (i.e., a karaoke voucher) that undermines their chronic goal (i.e., academic goals) compared with that observed when the focal task has not been initiated.

Method

Participants and design. There were 162 undergraduates (63 men and 99 women, with an average age of 20.6) from a large public university in China participated in this study in exchange for cash compensation. We predetermined a sample size of 168 participants for Studies 2 and 3, given that one predictor was manipulated as a between-subjects factor. Small variations in the number of participants occurred because of the availability across studies. This study used a focal task status (uninitiated vs. ongoing) × chronic academic goal strength mixed design, in which the focal task status was manipulated as a between-subjects factor, and the strength of the academic goal was measured as an individual difference factor. The dependent variable was the rate at which participants chose a karaoke voucher, a typical nonacademic form of entertainment that violates academic goals.

Procedure. Participants were recruited to complete a series of adding-to-10 questions (Fischhoff & Beyth, 1975). In each question, the participants were shown a 3 × 4 matrix, and they needed to identify two numbers in the matrix that added up to 10. An example was given to illustrate the rules. We instructed the participants that they needed to complete 30 adding-to-10 tasks, which was a repetitive and unpleasant experience, to receive their compensation. The original materials were in Chinese.

Before commencing the task, half of the participants were offered an extra reward for completing the task and were asked to choose between a voucher for karaoke and a voucher for a local restaurant of equal monetary value. The remaining half of the participants were offered this extra reward and made the choice after completing the 15th task (i.e., the middle of the entire task). After both groups completed all of the questions, we assessed the participants' commitment to academic goals on the ostensible sign-off page ("To what extent are you currently trying to do well academically?", 1 = *not at all* to 7 = *extremely*). The participants then received their compensation and were dismissed. We fully debriefed them via e-mail and delivered the extra reward voucher of their choice 1 week after the study.

Results and Discussion

Manipulation check. The key dependent variable was the rate at which the participants chose the karaoke voucher, which could be redeemed for three hours of entertainment in a singing booth. To test the validity of the dependent variable and to ensure that the participants genuinely considered spending time in a singing booth to be an activity that undermines their academic goals, while going to a restaurant for food does not, we conducted a pretest with 40 participants drawn from the same population. We asked these participants, "To what extent do you consider singing karaoke to take time away from studying?" and "To what extent do you consider dining in a restaurant to take time away from studying?" (1 = *not at all* to 7 = *definitely*). Two comparisons of their ratings with the midpoint of the 7-point scale ("4") confirmed that participants did consider singing karaoke to undermine their academic goals ($M = 4.90$, $SD = 1.48$; $t(39) = 3.84$, $p < .001$, $d = 0.61$), whereas going to a restaurant did not ($M = 1.65$, $SD = 1.21$; $t(39) = -2.28$, $p < .001$, $d = 1.94$).

Reward choice. The key dependent variable was the rate at which the participants chose the academic-goal-violating karaoke voucher. We conducted a logistic regression on the choice of the karaoke voucher (0 = food, 1 = karaoke) using the status of the focal task (−1 = uninitiated, 1 = ongoing), the strength of the academic goal, and their interaction term as predictors (mean-centered). The analysis yielded an interaction between the focal task status and academic goal strength, $B = 0.61$, Wald's $\chi^2(1) = 8.59$, $p = .003$. No other main effects emerged in this analysis (focal task status: $B = 0.11$, Wald $\chi^2(1) = 0.24$, $p = .628$; strength of the academic goal: $B = 0.03$, Wald $\chi^2(1) = 0.02$, $p = .899$). Further simple slope analyses revealed that when the participants had yet to initiate the focal task, the strength of the academic goal negatively predicted the likelihood of choosing the karaoke voucher, $B = -0.58$, Wald's $\chi^2(1) = 4.73$, $p = .030$, indicating that the more a student wanted to study, the less likely it was that he or she would choose a time-wasting activity as a reward. However, when the participants were in the middle of the focal task, the academic goal strength positively predicted the rate of choosing the karaoke voucher, $B = 0.64$, Wald's $\chi^2(1) = 4.01$, $p = .045$, suggesting that ironically, greater commitment to the academic goal increased the likelihood of choosing a time-wasting activity as a reward. See Figure 2 for an illustration (see the online supplemental materials for the other comparison using the Johnson-Neyman technique).

One potential concern in this study is that we measured the strength of the participants' chronic academic goals after they chose the reward; thus, their choice may have influenced the reported strength of the academic goal. To rule out this possibility, we ran an analysis of variance (ANOVA) on the strength of the participants' chronic academic goal using the reward choice as a predictor. We found no significant impact of the reward choice on

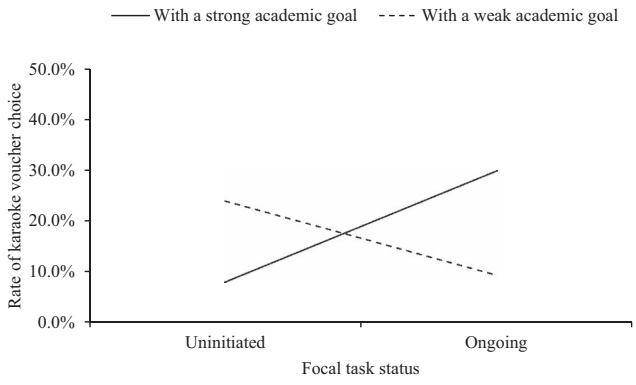

Figure 2. Rate of the karaoke choice as a function of focal task status and academic goal strength (Study 2). The rates of karaoke voucher choice were computed by inserting 1 *SD* above and below the mean academic goal strength into the regression.

participants' reported academic goal strength (M_{food} = 5.04, SD = 1.07 vs. $M_{karaoke}$ = 5.00, SD = 1.25), $F(1, 160) = 0.04$, $p = .835$.

Together with Study 1, this study confirmed that an increased preference for choice options that violate chronic goals depends on the status of the focal task, such that this preference vanishes both before initiating the task and following its completion. Specifically, when a focal task is ongoing, individuals' preference for rewards that violate the chronic goal is increased. When the focal task is inactive, such as when it either is yet to be initiated or has been completed, individuals are more likely to avoid rewards that violate the chronic goal despite having voluntarily chosen these rewards when the focal task is active.

The proposed mechanism suggests that people's preference for temptations as rewards increases during a focal task because the chronic goal is inhibited. If so, we should expect that this preference corresponds to people's commitment level to the chronic goal. Because the more committed they are, the more they resist such temptations under normal circumstances, leading to a greater increase in preference when a focal task inhibits the chronic goal. This reasoning has critical implications for situations in which people hold multiple chronic goals. In situations where the focal task inhibits all chronic goals, people should exhibit a preference for the option that violates the strongest chronic goal. Our next study tests this prediction.

Study 3

Study 3 aimed to address the situation of multiple chronic goals with a balanced design in which participants could choose between two pleasurable options, each of which violated one of their chronic goals. Specifically, we were interested in people's preference between cheesecake, which violates the dieting goal, and karaoke, which violates the academic goal. We predicted that the preference shift for a contingent reward during and after a pressing focal task should depend on the relative strength of these goals: People with a stronger academic (vs. dieting) goal should be more likely to choose karaoke (vs. cheesecake) as a contingent reward during the task than after it.

Method

Participants and design. A total of 175 undergraduates (78 men and 97 women, with an average age of 20.5) from a large public university in China participated in this study in exchange for cash compensation. This study used a focal task status (active vs. completed) × relative chronic goal strength mixed design, in which the focal task status was manipulated as a between-subjects factor, and the relative strength of participants' chronic goals was measured as an individual difference factor. The key dependent variable was the reward choice that participants made.

Procedure. We recruited the participants to perform a proofreading task that required them to proofread an 8-page article and identify typographical errors (e.g., "wokr" or "aple") within 10 min, a challenging task that students could barely finish within the given time frame. The original instructions were in Chinese and the article for proofreading was in English. The cover story informed the participants that this task was designed to test college students' verbal abilities and that their performance would be determined by the number of typos that they could correctly identify. We also offered participants a performance-based bonus if they outperformed 70% of the participants.

Half of the participants were interrupted after the fifth minute (halfway through the task) and were asked to choose one of two vouchers of equal value (approximately $6) as an extra reward for completing the task. One option was a voucher for a 3-h karaoke session, a pastime that violates the academic goal. The other option was a voucher for a 6-in. cheesecake, a dessert that violates the dieting goal. The remaining half of the participants was offered the same choice immediately after the entire 10-min task.

In contrast to the previous studies, for all participants, we measured the strength of both their dieting goal and academic goal at the end of the experiment session. Before sign-off, we asked the participants to answer some demographic and lifestyle questions. Among the filler questions (e.g., "To what extent do you frequent the school dining hall?" and "To what extent do you like traveling?", 1 = *not at all* to 7 = *extremely*), we asked, "To what extent are you concerned about being slim?" and "To what extent are you currently trying to do well academically?" (1 = *not at all* to 7 = *extremely*). The order of the two questions was counterbalanced. After completing the session, all participants received compensation and were dismissed. We fully debriefed them via e-mail and delivered the extra reward voucher according to their choice 1 week after the study.

Results and Discussion

We were particularly interested in how the relative strength between the dieting and the academic goal influenced participants' reward choices. For this analysis, we first created an index of relative academic-dieting goal strength by subtracting the reported strength of the chronic dieting goal from that of the academic goal. A greater number on this index indicated a stronger relative commitment to the academic goal over the dieting goal. On average, the participants were more committed to the academic goal (M = 4.41, SD = 1.29) than to the dieting goal (M = 3.90, SD = 1.81), $t(174) = 3.11$, $p = .002$, $d = 0.33$, resulting in an average relative strength index of 0.52 (SD = 2.15). We mean-centered the index and submitted it into the following analyses.

We conducted a logistic regression on the participants' reward choice (0 = cheesecake, 1 = karaoke) using the focal task status (−1 = active, 1 = completed), the relative strength of the participants' academic-dieting goal and the interaction term as predictors (mean-centered). The analysis yielded a Focal Task Status × Relative Goal Strength interaction, $B = -0.49$, Wald's $\chi^2(1) = 17.30$, $p < .001$. No other main effects emerged (focal task status: $B = 0.13$, Wald $\chi^2(1) = 0.24$, $p = .621$; relative strength of academic-dieting goal: $B = 0.07$, Wald $\chi^2(1) = 0.33$, $p = .565$).

We then conducted an analysis that compared the slopes of the relative chronic goal strength for different focal task statuses. When the participants were in the middle of the focal task, the relative strength of their academic-dieting goal positively predicted the likelihood of choosing the karaoke voucher, $B = 0.55$, Wald's $\chi^2(1) = 11.55$, $p = .001$, confirming that greater commitment to one's academic goal over the dieting goal increased the likelihood of choosing a time-wasting karaoke session as a reward. However, once the focal task had been completed, the relative strength of the academic goal over the dieting goal negatively predicted the likelihood of choosing the karaoke voucher,

$B = -0.42$, Wald's $\chi^2(1) = 6.24$, $p = .013$. See Figure 3 for an illustration. We also conducted two separate analyses to examine the participants' preference for the chronic-goal-violating option regarding each specific chronic goal, and these analyses revealed consistent results. See the online supplemental materials for these additional analyses.

Critically for our hypothesis, the results confirmed that the likelihood of choosing a chronic-goal-violating reward during a focal task positively correlates with the relative strength of this chronic goal, supporting our argument that the inhibition of the chronic goal causes the choice of temptation as the reward. By investigating the situation of multiple chronic goals using a balanced design, this study addresses the possibility that people merely prefer more pleasurable options during a focal task. Instead, the preference shift is chronic-goal-specific and depends on the relative strength of the specific chronic goal.

Another insight from this study is that our results are unlikely to be a consequence of mere distraction. Conceptually, it is possible that the observed phenomenon occurs because people become distracted during the focal task and, therefore, are more vulnerable to temptations. However, if distraction could account for the effects, we should always observe a main effect of focal task status on reward choice (i.e., people become distracted during the focal task and are, thus, more likely to choose temptations), regardless of the strength of the chronic goal. However, we found that the preference shift is consistent with the strength of the specific chronic goal, suggesting that this preference is unlikely to be a consequence of mere distraction.

We argue that this shift in preference occurs because the pressing focal task inhibits chronic goals and renders options that normally violate chronic goals more attractive. What people may not be aware of when they are making these choices, however, is that by the time the focal task is accomplished, a previously inhibited chronic goal will become active again and dampen the desirability of the chosen rewards. If our reasoning holds, in situations in which the chronic goal is not inhibited during the focal task, no increase of the preference for temptations should occur. In this case, people should always avoid the chronic-goal-violating options, regardless of the status of the focal task. Our next study explores this prediction as a further test of the underlying mechanism.

Study 4

As an extension of the first three studies, Study 4 aimed to examine whether the preference shift for a chronic-goal-violating reward would disappear if the chronic goal remains activated during the focal task. In this study, participants performed a code recognition task and were offered a reward either when the task was ongoing or when the task had been completed. Prior research has shown that exposure to goal-related environmental cues can activate existing goals (Papies & Hamstra, 2010; van Koningsbruggen, Stroebe, & Aarts, 2011). Thus, we kept the dieting goal activated using a subtle manipulation for half of the participants throughout the focal task, and explored whether such an intervention would attenuate the preference inconsistency.

Method

Participants and design. There were 316 undergraduates (91 men and 225 women, with an average age of 19.8) from a large university in China participated in the study. The target sample size was 336 because an additional between-subjects predictor was added, and all participants were included in the following analyses. The study used a focal task status (ongoing vs. completed) × activation of dieting goal (activated vs. control) × chronic dieting goal strength mixed design, in which the focal task status and the activation of dieting goal were manipulated as between-subjects factors, and the strength of participants' dieting goal was measured as an individual difference factor. The dependent variable was participants' choice of cheesecake, a typical food item that violates the dieting goal (Milyavskaya et al., 2015).

Procedure. The main experimental task was a code recognition task. The task required participants to recognize and type 80

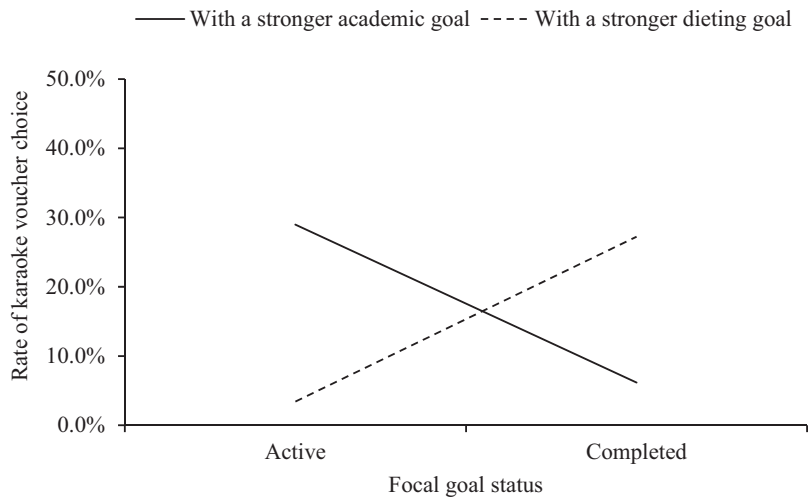

Figure 3. Rate of the karaoke choice as a function of focal task status and relative goal strength (Study 3). The rates of karaoke voucher choice were computed by inserting 1 *SD* above (a stronger academic goal) and below (a stronger dieting goal) the mean relative goal strength into the regression.

lines of gotcha code (the barely recognizable verification code in a distorted format that people are often asked to enter when signing into online accounts). The original instructions were in Chinese and the gotcha code consisted of a sequence of English letters. The cover story informed the participants that this task aimed to test their visual flexibility and that if, and only if, they correctly identified all the words, they would receive compensation at the end of the experiment.

We manipulated the activation level of participants' dieting goal by placing either a health magazine or a geography magazine on their desk during the code identification task. In the chronic-goal-activated conditions, the health magazine showed a fit runner on the cover and headlines such as "Ten misunderstandings about dieting" and "Top stars tell you how to keep in shape." By reminding participants of the dieting goal, we aimed to keep their chronic dieting goal (if they had one) activated through the focal task (Papies & Hamstra, 2010; van Koningsbruggen et al., 2011). In the control conditions, a geography magazine highlighted an archaeological discovery on the cover. The experimenter explained that a network outage had occurred on a few prior occasions and that the magazines were provided so that the participants could read them while waiting for the problem to be fixed in case such an outage occurred again. Similar to the previous experiments, the participants encountered the choice between a cheesecake voucher and an entertainment voucher either halfway through the code recognition task (i.e., ongoing focal task conditions) or after they had completed the entire task (i.e., completed focal task conditions). Note that we placed the magazines on the desks before the experiment started, and the participants completed the experiment in a private space with a personal computer to minimize the possibility of social signaling or other demand effects.

As in the previous studies, we measured the strength of the participants' dieting goal when they signed off from the experiment session ("To what extent are you concerned about being slim?", 1 = *not at all* to 7 = *extremely*) and asked other filler questions (e.g., "To what extent do you frequent the school dining hall?", 1 = *not at all* to 7 = *extremely*). In addition, as a manipulation check for the effect of the magazines on the activation level of the participants' chronic goal, we asked the participants to list their life goals ("Please type in the goals that you are currently pursuing"). We presented 10 blanks and asked them to type in all goals that they currently wanted to achieve (Cacioppo & Petty, 1981). They could spend as much time as they wished on these questions. One week after they completed the survey, all participants were debriefed via e-mail and received the voucher of their choice.

Results and Discussion

Manipulation check. To verify that the health magazine did keep participants' dieting goal activated, we hired three independent research assistants who were unaware of the purpose of the research (interjudge reliability, .92) to code the participants' self-reported goals (0 = nondieting-related goals, 1 = dieting-related goals). We calculated the percentage of dieting-related goals among all the listed goals and created an index for the activation level of participants' dieting goal. A higher value of the index indicated a higher activation level of their dieting goal (Liberman & Förster, 2000; Rohrer & Wixted, 1994). As expected, participants who were presented with the health magazine listed dieting-related goals more frequently ($M = 11\%$, $SD = .21$) than those who were presented with the geography magazine ($M = 7\%$, $SD = .11$), $t(314) = 2.41$, $p = .017$, $d = 0.24$, showing the success of the manipulation. We further examined whether this manipulation of the goal activation level also influenced the reported strength of participants' chronic dieting goal and found no significant effect ($M = 3.81$, $SD = 1.46$ vs. $M = 3.90$, $SD = 1.43$, $t(314) = 0.31$, $p = .578$, $d = 0.06$). This finding was also consistent with prior literature showing that priming does not increase goal strength (Strahan, Spencer, & Zanna, 2002).

Reward choice. Our previous studies have consistently shown a Focal Task Status × Chronic Goal Strength two-way interaction: That is, participants with a strong chronic goal showed greater preference for chronic-goal-violating rewards during the focal task than after its completion. We attribute this increased preference to the inhibition of people's chronic goal. In this study, we used a subtle manipulation to maintain chronic goal activation for half of our participants. Thus, we expected a Focal Task Status × Chronic Goal Activation × Chronic Goal Strength three-way interaction, such that the Focal Task Status × Chronic Goal Strength two-way interaction would emerge when the chronic goal was not activated (replicating our earlier studies), but would disappear when the chronic goal was activated.

Thus, we conducted a logistic regression on the participants' choice of the cheesecake (0 = entertainment, 1 = cheesecake) voucher using the focal task status (−1 = ongoing, 1 = completed), the activation of their dieting goal (−1 = control, 1 = activated) and the strength of participants' chronic dieting goal as predictors (mean-centered). The analysis yielded a significant three-way interaction across the focal task status, the activation of their dieting goal and the strength of participants' chronic dieting goal, $B = 0.25$, Wald's $\chi^2(1) = 5.62$, $p = .018$. The Focal Task Status × Chronic Dieting Goal Strength interaction, $B = -0.20$, Wald's $\chi^2(1) = 3.87$, $p = .049$, and the Dieting Goal Activation × Chronic Dieting Goal Strength interaction were also significant, $B = -0.23$, Wald's $\chi^2(1) = 5.12$, $p = .024$. No other significant effects emerged in this analysis.

To further explore the three-way interaction, we first investigated the control condition when a geography magazine was presented. Like previous studies, there was a significant interaction between the focal task status and the strength of the chronic dieting goal, $B = -0.47$, Wald's $\chi^2(1) = 7.97$, $p = .005$. When participants were completing the focal task (i.e., in the middle of the code recognition task), the strength of their chronic dieting goal positively predicted the rate at which they chose the cheesecake voucher, $B = 0.55$, Wald's $\chi^2(1) = 4.02$, $p = .045$, indicating that a stronger chronic dieting goal increased individuals' likelihood of choosing a fatty (yet tempting) food as their contingent reward. However, once the focal task had been completed, the rate of choosing the cheesecake voucher decreased as the strength of participants' dieting goal increased, $B = -0.39$, Wald's $\chi^2(1) = 4.29$, $p = .038$, suggesting that once the focal task was no longer their main concern, committed dieters avoided the fatty temptation. These results replicated our findings in the first three studies.

What occurs if participants' dieting goal remains activated throughout the focal task? For the participants who were exposed to the health magazine during the focal task, the interaction between the focal task status and the strength of the chronic dieting

goal was no longer significant, $B = 0.02$, Wald's $\chi^2(1) = 0.02$, $p = .879$. Specifically, the rate of choosing the cheesecake voucher decreased as the strength of participants' dieting goal increased, regardless of whether the focal task was ongoing ($B = -0.41$, Wald $\chi^2(1) = 5.82$, $p = .016$) or completed ($B = -0.37$, Wald $\chi^2(1) = 4.56$, $p = .033$), suggesting a clear pattern of self-control (see Figure 4). Overall, when participants' chronic goal remained activated, they did not prefer the temptation as a reward even when the focal task was ongoing, confirming our hypothesis that the increased preference for items that undermine a chronic goal is caused by the inhibition of that goal during a focal task.

In Study 5, our final study, we extend our investigation by exploring the motivational consequences of different rewards during the focal task. We propose that the choice and switch of contingent rewards may serve as an adaptive self-regulation strategy to help people maintain multiple pursuits. If this is the case, individuals who anticipate a chronic-goal-violating reward during the focal task should be better motivated than those who anticipate other rewards.

Study 5

Study 5 is set up to test whether, for people with a dieting goal, preferring a dieting-goal-violating reward indeed facilitates their task performance. To examine this effect, we artificially primed the dieting goal for half of the participants and measured if they performed better when expecting a dieting-goal-violating reward, compared with a control reward.

More important, Study 5 was distinctive from the previous studies in a few ways. First, this study aimed to test the downstream impact of rewards, so we shifted from measuring people's reward choice to assigning different rewards to them, and the key dependent variable became their task performance when expecting the rewards. Second, unlike Study 4, where we used a very subtle manipulation to keep one's chronic goal activated throughout the focal task, Study 5 used a much more explicit manipulation to prime the dieting goal for half of the participants before the task. This manipulation ensured that participants in this condition had an enhanced dieting goal regardless of their original goal strength, allowing us to examine whether people with this goal would indeed perform better when expecting a dietary temptation (vs. a control reward). As a result, participants' original goal strength would no longer be a meaningful predictor, and we should only expect a Dieting Goal Manipulation × Reward Type two-way interaction to influence participants' task performance.

Also, unlike our previous studies that offered vouchers to be redeemed later, this experiment presented participants with the real rewards that they could consume as soon as they finished the focal task. Using this immediate reward also helps us to address the concern that our findings can be partially attributed to the immediacy of reward.

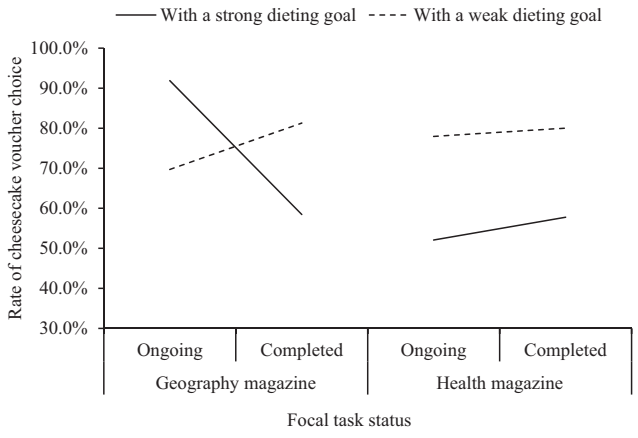

Figure 4. Rate of the cheesecake choice as a function of focal task status, dieting goal strength, and activation level of dieting goal (Study 4). The rates of cheesecake voucher choice were computed by inserting 1 *SD* above and below the mean dieting goal strength into the regression.

Method

Participants and design. A total of 203 undergraduates (60 men and 142 women, 1 unreported, with an average age of 19.5) from a large university in China participated in this study in exchange for cash compensation. Given a medium effect size, we predetermined a sample size of 50 for each condition. This study used a 2 (dieting goal: control vs. enhanced) × 2 (reward type: control vs. dieting-goal-violating) between-subjects design. The dependent variable was participants' performance change before and after being offered a reward.

Procedure. Participants were recruited to complete a set of independent studies. The original materials were in Chinese. Upon coming to the lab, we measured all participants' height, weight, and body fat level with our standardized equipment under the cover story of "collecting anonymous information on the state of college students' health." Participants then input these measures in a survey and answered questions about their daily activities (e.g., "Do you stay up late?", 1 = *never* to 5 = *very often*). After the survey, the onscreen instructions presented them with a loading page ("The system is calculating your health score, please wait"). Then, all participants received the same health score of "72" on a 100-point scale. The instructions further explained the score as follows: "This score indicates that you are in a sub-health condition, which means that even though you do not have obvious diseases, you may occasionally experience minor health issues such as headaches and insomnia." We then manipulated participants' dieting goal by giving them different recommendations: In the enhanced dieting goal conditions, participants read, "A healthy lifestyle is advised to improve your health state. In particular, be cautious about your daily calorie intake." In the control conditions, they read, "A healthy lifestyle is advised to improve your health state. In particular, be cautious about balancing work and rest."

All participants then proceeded to a 5-min filler survey before commencing the focal task. The focal task was a clicking game that professed to assess people's "finger dexterity." The task required participants to use a mouse to click a target figure on the screen as fast as they could for 6 min. The figure randomly changed in shape and position on the screen. Participants were informed that only clicks in the range of the figure counted and that if they outperformed half of the participants, they would receive an extra reward.

Three minutes into the task, participants encountered a break, during which we offered them an extra reward for completing the entire task. The onscreen instructions explained that because of

limited availability of different types of rewards, the system would randomly choose a reward for them. We emphasized that the rewards were of equal monetary value and that the participants would receive the reward only if they successfully completed the task. On the next page, they were offered either a chocolate bar or a pack of chewing gum. Participants then resumed and completed the task.

On a sign-off page, we measured the participants' dieting goal with this question: "To what extent are you concerned about keeping your diet?" (1 = *not at all* to 7 = *extremely*) as a manipulation check. The participants then received their cash compensation and collected the extra reward (if they succeeded) before leaving.

Results and Discussion

Manipulation check. To examine the effectiveness of our manipulation, we conducted an ANOVA on participants' self-reported dieting goal. The analysis revealed that participants in the enhanced dieting goal conditions were more concerned about dieting than the control group, $M_{\text{enhanced}} = 5.25$, $SD = 1.32$ versus $M_{\text{control}} = 4.76$, $SD = 1.71$, $t(201) = 2.26$, $p = .025$, $d = 0.32$.

We also tested people's perception toward the two choice options. In an independent pretest from the same population ($N = 80$, 28 men and 52 women, average age 19.5), we asked participants to indicate their opinions about the unhealthiness of the two options ("To what extent do you consider chewing gum/chocolate bar to violate a dieting goal?") and how much they liked them ("To what extent do you like chewing gum/chocolate bar?", 1 = *not at all* to 7 = *extremely*). Two paired t tests revealed that participants considered that a chocolate bar poses a greater threat to a dieting goal ($M = 4.68$, $SD = 1.32$) than chewing gum, $M = 3.45$, $SD = 1.07$, $t(79) = 8.48$, $p < .001$, $d = 0.94$, but they exhibited overall similar preferences for these items ($M_{\text{chocolate bar}} = 4.71$, $SD = 1.30$ vs. $M_{\text{chewing gum}} = 4.50$, $SD = 0.98$, $t(79) = 1.39$, $p = .168$, $d = 0.15$). The results confirmed that a chocolate bar was a dieting-goal-violating snack, whereas chewing gum was less of a concern, and these two options were similarly desirable to our participants.

Performance improvement. We subtracted the number of clicks in the first 3 min from that in the second 3 min to create an index of participants' performance improvement and then conducted a 2 (dieting goal: control vs. enhanced) × 2 (reward type: control vs. dieting-goal-violating) ANOVA on participants' performance improvement. The analysis yielded a Dieting Goal Manipulation × Reward Type interaction, $F(1, 199) = 5.07$, $p = .025$. The reward type revealed a marginally significant main effect, $M_{\text{chocolate bar}} = 14.44$, $SD = 91.67$ versus $M_{\text{chewing gum}} = -4.46$, $SD = 63.98$, $F(1, 199) = 3.20$, $p = .075$. On average, the performance of participants who expected a chocolate bar as a contingent reward increased by 14.44 clicks in the second half of the task than in the first half, whereas for those expecting a pack of chewing gum, their performance in the second half of the task decreased by 4.46 clicks compared with that in the first half. No significant main effect emerged for the dieting goal manipulation, $F(1, 199) = 0.65$, $p = .420$.

Further exploration of the interaction revealed more details on the impact of a contingent reward: For the participants with an enhanced dieting goal, the chocolate bar, being a dieting-goal-violating reward, motivated their performance ($M = 33.00$, $SD = 115.62$) better than the chewing gum ($M = -11.56$, $SD = 68.09$), $F(1, 199) = 8.18$, $p = .005$. However, for those in the control conditions, expecting a chocolate bar boosted their performance to the same extent as expecting a pack of chewing gum, $M_{\text{chocolate bar}} = -0.75$, $SD = 63.19$ versus $M_{\text{chewing gum}} = 4.35$, $SD = 58.00$, $F(1, 199) = 0.11$, $p = .745$.

In addition, we compared the motivating effects of the same reward for different groups. Offering a chocolate bar as a post-completion reward worked better for the participants with an enhanced dieting goal ($M = 33.00$, $SD = 115.62$) than for those without ($M = -0.75$, $SD = 63.19$), $F(1, 199) = 4.62$, $p = .033$. In comparison, offering chewing gum functioned similarly for both groups of participants, $M_{\text{enhanced}} = -11.56$, $SD = 68.09$ versus $M_{\text{control}} = 4.35$, $SD = 58.00$, $F(1, 199) = 1.06$, $p = .306$ (see Figure 5).

The results of this study provided direct support for the instrumental value of the contingent rewards. By experimentally manipulating participants' dieting goal, we demonstrated that a dieting-goal-violating reward functions better in boosting performance for a person who cares about this goal, compared with an otherwise equally attractive control reward. More important, because of people's tendency to move away from these temptations after the accomplishment of the focal task, they become useful instruments that facilitate the focal task at hand without actually undermining one's long-term aspirations.

General Discussion

To accomplish multiple goals with varied priorities, people shift their valuation and preference for items that either serve or undermine these goals accordingly (Brendl & Higgins, 1996; Brendl et al., 2003; Ferguson & Bargh, 2004; Fitzsimons & Shah, 2008; Markman & Brendl, 2000; Moors & De Houwer, 2001). This research explores a unique situation in which the dynamics of multiple goals lead to a preference shift in choosing contingent rewards. During the completion of a focal task, people's preference for temptations that undermine their chronic goals increases, as the active focal task temporarily inhibits the chronic goals that these options violate. After the completion of the focal task, however, people find the previously preferred temptations less attractive, as the chronic goals have regained priority and once again devalue the temptations. This preference shift in turn serves

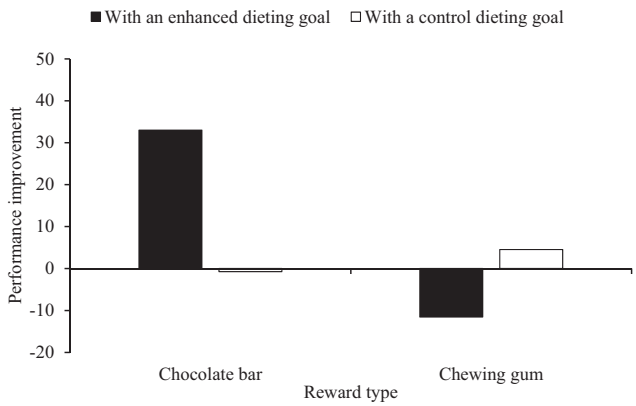

Figure 5. Performance improvement (in clicks) as a function of dieting goal manipulation and reward type (Study 5).

as an adaptive self-regulation mechanism that increases the motivation for an immediate task while protecting people's long-term pursuits.

In five studies, we found consistent support for this robust effect and its adaptive value. Study 1 presented a stringent test of this shift using a within-subject design and demonstrated that the same group of people who had preferred a chronic-goal-violating reward moments earlier altered their decision once the pressing focal task had been achieved. Study 2 demonstrated the same preference shift when the focal task was not yet initiated and when it was active, indicating that the effect should be attributed to the status of the focal task. Using a balanced design, Study 3 investigated the situation of multiple chronic goals and demonstrated that the preference increase for the chronic-goal-violating option during a focal task was chronic-goal-specific instead of merely overall preference for more pleasurable options. Study 4 revealed that as long as the individuals' chronic goal remained activated, their preference for the chronic-goal-violating option did not increase, even when the focal task was ongoing. Finally, Study 5 demonstrated that offering participants a dieting-goal-violating reward better motivated their subsequent focal task than a control reward for those with an enhanced dieting goal.

The root of this preference shift lies in the dynamic nature of the goal activation level. Individuals make choices based on their present valuation of items, which is influenced by the activation level of their relevant goals at the moment. What people fail to anticipate is that their motivational state, and subsequently their valuation of relevant items, change as the activation level of their goals changes (Ferguson & Bargh, 2004; Moors & De Houwer, 2001). As a result, what people find appealing at the time they make a choice may turn out to be something that they wish to avoid later on. We identify this process as the explanation for why people's likelihood to consume the reward that they have chosen decreases after completing the focal task.

We further explore the motivational consequences of different rewards and confirm that these increased preferences for temptations may serve as an adaptive self-regulation mechanism. By linking people's present goal-directed behaviors to temptations, the contingent rewards increase the motivation for the imminent task. However, because of the shifting activation level of the chronic goal, people become less likely to consume the reward that they initially preferred when the task is completed, making this mechanism particularly helpful as it motivates the present pursuit without harming one's long-term aspirations.

Theoretical Implications

The present research extends the literature by showing that the value of choice targets depends on the activation level of the goals that these options serve (Brendl et al., 2003; Ferguson, 2007; Ferguson & Bargh, 2004; Fishbach et al., 2010). We echo the finding that choice options increase in value when the goal they serve becomes more activated and decrease in value when the goal becomes less activated. In a contingent reward context, we found the reverse effect: The usually devalued temptations regain value when the chronic goal that devalues them becomes inhibited by something more imminent, and the attractiveness of choice options depends on not only the relative activation level of the goal that it is associated with, but also the extent to which people are committed to the chronic goal. This mechanism creates the ironic effect that the more committed one is to a certain goal, the more likely he or she is to violate the goal when there is something more imminent.

Another important implication of the present research is that people's seemingly erroneous choices may serve as an adaptive self-regulation mechanism to facilitate the accomplishment of multiple goals. Instead of thinking of this preference inconsistency as an abnormality, we found that it reflects individuals' rapidly shifting priorities and helps to maximize their total attainment. As we demonstrate in our experiments, simply expecting to violate a chronic goal motivates people, particularly those who are highly committed to the chronic goal. Although the plan seems costly, the consistent failure in realizing the violation allows people to enjoy the benefits at both ends.

The present findings also shed light on the dynamic nature of temptation. Whereas many items are viewed as natural temptations (e.g., chocolate and partying), this label is misleading. By definition, temptation is also a means to a goal in itself and only acquires the status of temptation when the goal that it serves is overshadowed by a more imminent and important goal. For this reason, nothing is always a temptation, and anything may become a temptation at some point. For example, whereas partying might be viewed as a temptation when considering the goal of completing work, the same desire to accomplish work might become a temptation when the goal shifts to spending more time with family, at which time one must resist the urge to return to one's desk and complete an article. The present findings provide further evidence for this conceptualization of temptation by showing that although one might need to resist a choice option to ensure the successful attainment of one goal, in the next moment, the same choice could become a useful instrument to motivate greater effort for an important endeavor.

Limitations and Future Research

Although we did not explicitly test the possibility, we speculate that individuals might be unaware of the potential changes in goal priority and how these priorities affect the valuation of choice options. Indeed, people have been found to buy more food during grocery shopping trips when they are hungry (Gilbert, Gill, & Wilson, 2002; Tom & Rucker, 1975) and to seek products that are more popular when they have been socially excluded (Mead, Baumeister, Stillman, Rawn, & Vohs, 2011). This possibility suggests that people might have developed an adaptive self-regulation instrument beyond their conscious awareness. It would be interesting to examine the extent to which people are aware of the goal dependence of their valuation, which should shed important light on our understanding of how people view their choice options.

Similarly, although we did not directly explore the impact of the perceived relationship between the focal task and chronic goals in the observed effect, we speculate that different intergoal relationships should affect the preference shift. If the completion of a focal task also partially fulfills one's chronic goal, one may experience less self-control conflict after task completion and may be more likely to consume the previously chosen reward. For example, for a dieter who tries complete a difficult task, he or she is more likely to choose a high-calorie option as a reward when an opportunity arises. Based on our findings, his or her actual willingness to consume the reward should decrease after the work is done.

However, if this person thinks of this difficult task as a calorie-burning activity, it would partially fulfill the dieting goal, such that the willingness to consume the high-calorie option may not decrease as much.

Following this line of reasoning, the role of culture might also enter the picture through altering the structure of the associative network of goals. For example, certain cultures might see competing goals as more compatible with each other (e.g., Grouzet et al., 2005), such that people do not see options serving one goal as violating alternative goals. As a result, there is less of a contrast, and people's tendency to choose a temptation as a reward might be lower even when there is a more pressing task at hand.

Finally, it would also be interesting to explore how this preference shift influences individuals' reward consumption. Our findings indicate that once people accomplished the challenging task and were offered a second chance to choose, they showed a willingness to switch away from the chronic-goal-violating reward that they had previously chosen. However, what if people do not have a second chance, such that the reward is procured at the time of the initial decision or the previous choice cannot be changed? For example, a dieter already bought a cheesecake to be consumed after final exams. Will the rebound of the chronic dieting goal lead her to throw it away or only have a small bite? Or, more interestingly, would this strategic choice serve as a signal and cause her to consume even more calories than initially planned? Going beyond the present findings, these possibilities present interesting directions for future exploration.

References

Ainslie, G. (1975). Specious reward: A behavioral theory of impulsiveness and impulse control. *Psychological Bulletin, 82,* 463–496. http://dx.doi.org/10.1037/h0076860

Ainslie, G., & Haslam, N. (1992). Hyperbolic discounting. In G. Loewenstein & J. Elster (Eds.), *Choice over time* (pp. 57–92). New York, NY: Russell Sage Foundation.

Austin, J. T., & Vancouver, J. B. (1996). Goal constructs in psychology: Structure, process, and content. *Psychological Bulletin, 120,* 338–375. http://dx.doi.org/10.1037/0033-2909.120.3.338

Bandura, A., & Perloff, B. (1967). Relative efficacy of self-monitored and externally imposed reinforcement systems. *Journal of Personality and Social Psychology, 7,* 111–116. http://dx.doi.org/10.1037/h0024974

Bandura, A., & Whalen, C. K. (1966). The influence of antecedent reinforcement and divergent modeling cues on patterns of self-reward. *Journal of Personality and Social Psychology, 3,* 373–382. http://dx.doi.org/10.1037/h0023022

Bélanger, J. J., Lafrenière, M.-A. K., Vallerand, R. J., & Kruglanski, A. W. (2013). When passion makes the heart grow colder: The role of passion in alternative goal suppression. *Journal of Personality and Social Psychology, 104,* 126–147. http://dx.doi.org/10.1037/a0029679

Berridge, K. C. (2000). Reward learning: Reinforcement, incentives, and expectations. In D. L. Medin (Ed.), *Psychology of learning and motivation* (Vol. 40, pp. 223–278). San Diego, CA: Academic Press.

Brendl, C. M., & Higgins, E. T. (1996). Principles of judging valence: What makes events positive or negative? In P. Z. Mark (Ed.), *Advances in experimental social psychology* (Vol. 28, pp. 95–160). New York, NY: Academic Press.

Brendl, C. M., Markman, B. A., & Messner, C. (2003). The devaluation effect: Activating a need devalues unrelated objects. *Journal of Consumer Research, 29,* 463–473. http://dx.doi.org/10.1086/346243

Brickman, P., Abbey, A., & Halman, J. L. (1987). *Commitment, conflict, and caring*. Englewood Cliffs, NJ: Prentice Hall.

Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: The thought-listing technique. In T. Merluzzi, C. Glass, & M. Genest (Eds.), *Cognitive assessment* (pp. 309–342). New York, NY: Guilford Press.

Cameron, J., & Pierce, W. D. (1994). Reinforcement, reward, and intrinsic motivation: A meta-analysis. *Review of Educational Research, 64,* 363–423. http://dx.doi.org/10.3102/00346543064003363

Carver, C. S., & Scheier, M. F. (2001). *On the self-regulation of behavior*. New York, NY: Cambridge University Press.

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

Chun, W. Y., Kruglanski, A. W., Sleeth-Keppler, D., & Friedman, R. S. (2011). Multifinality in implicit choice. *Journal of Personality and Social Psychology, 101,* 1124–1137. http://dx.doi.org/10.1037/a0023778

Enzle, M. E., Roggeveen, J. P., & Look, S. C. (1991). Self-versus other-reward administration and intrinsic motivation. *Journal of Experimental Social Psychology, 27,* 468–479. http://dx.doi.org/10.1016/0022-1031(91)90004-P

Erskine, J. A. K., & Georgiou, G. J. (2010). Effects of thought suppression on eating behaviour in restrained and non-restrained eaters. *Appetite, 54,* 499–503. http://dx.doi.org/10.1016/j.appet.2010.02.001

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41,* 1149–1160. http://dx.doi.org/10.3758/BRM.41.4.1149

Fedoroff, I. C., Polivy, J., & Herman, C. P. (1997). The effect of pre-exposure to food cues on the eating behavior of restrained and unrestrained eaters. *Appetite, 28,* 33–47. http://dx.doi.org/10.1006/appe.1996.0057

Ferguson, M. J. (2007). On the automatic evaluation of end-states. *Journal of Personality and Social Psychology, 92,* 596–611. http://dx.doi.org/10.1037/0022-3514.92.4.596

Ferguson, M. J., & Bargh, J. A. (2004). Liking is for doing: The effects of goal pursuit on automatic evaluation. *Journal of Personality and Social Psychology, 87,* 557–572. http://dx.doi.org/10.1037/0022-3514.87.5.557

Fischhoff, B., & Beyth, R. (1975). I knew it would happen: Remembered probabilities of once—Future things. *Organizational Behavior and Human Performance, 13,* 1–16. http://dx.doi.org/10.1016/0030-5073(75)90002-1

Fishbach, A., Friedman, R. S., & Kruglanski, A. W. (2003). Leading us not unto temptation: Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology, 84,* 296–309. http://dx.doi.org/10.1037/0022-3514.84.2.296

Fishbach, A., Zhang, Y., & Trope, Y. (2010). Counteractive evaluation: Asymmetric shifts in the implicit value of conflicting motivations. *Journal of Experimental Social Psychology, 46,* 29–38. http://dx.doi.org/10.1016/j.jesp.2009.09.008

Fitzsimons, G. M., & Shah, J. Y. (2008). How goal instrumentality shapes relationship evaluations. *Journal of Personality and Social Psychology, 95,* 319–337. http://dx.doi.org/10.1037/0022-3514.95.2.319

Förster, J., Liberman, N., & Higgins, E. T. (2005). Accessibility from active and fulfilled goals. *Journal of Experimental Social Psychology, 41,* 220–239. http://dx.doi.org/10.1016/j.jesp.2004.06.009

Gilbert, D. T., Gill, M. J., & Wilson, T. D. (2002). The future is now: Temporal correction in affective forecasting. *Organizational Behavior and Human Decision Processes, 88,* 430–444. http://dx.doi.org/10.1006/obhd.2001.2982

Grouzet, F. M. E., Kasser, T., Ahuvia, A., Dols, J. M. F., Kim, Y., Lau, S., . . . Sheldon, K. M. (2005). The structure of goal contents across 15 cultures. *Journal of Personality and Social Psychology, 89,* 800–816. http://dx.doi.org/10.1037/0022-3514.89.5.800

Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Woo Young,

C., & Sleeth-Keppler, D. (2002). A theory of goal systems. In P. Z. Mark (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 331–378). New York, NY: Academic Press.

Laran, J. (2010). The influence of information processing goal pursuit on postdecision affect and behavioral intentions. *Journal of Personality and Social Psychology, 98,* 16–28. http://dx.doi.org/10.1037/a0017422

Latham, G. P., & Locke, E. A. (1991). Self-regulation through goal setting. *Organizational Behavior and Human Decision Processes, 50,* 212–247. http://dx.doi.org/10.1016/0749-5978(91)90021-K

Liberman, N., & Förster, J. (2000). Expression after suppression: A motivational explanation of postsuppressional rebound. *Journal of Personality and Social Psychology, 79,* 190–203. http://dx.doi.org/10.1037/0022-3514.79.2.190

Locke, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance, 3,* 157–189. http://dx.doi.org/10.1016/0030-5073(68)90004-4

Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance: 1969–1980. *Psychological Bulletin, 90,* 125–152. http://dx.doi.org/10.1037/0033-2909.90.1.125

Louro, M. J., Pieters, R., & Zeelenberg, M. (2007). Dynamics of multiple-goal pursuit. *Journal of Personality and Social Psychology, 93,* 174–193. http://dx.doi.org/10.1037/0022-3514.93.2.174

Macrae, C. N., Bodenhausen, G. V., Milne, A. B., & Jetten, J. (1994). Out of mind but back in sight: Stereotypes on the rebound. *Journal of Personality and Social Psychology, 67,* 808–817. http://dx.doi.org/10.1037/0022-3514.67.5.808

Mahoney, M. J. (1974). Self-reward and self-monitoring techniques for weight control. *Behavior Therapy, 5,* 48–57. http://dx.doi.org/10.1016/S0005-7894(74)80085-7

Markman, A. B., & Brendl, C. M. (2000). The influence of goals on value and choice. In L. M. Douglas (Ed.), *Psychology of learning and motivation* (Vol. 39, pp. 97–128). New York, NY: Academic Press.

Martin, L. L., Tesser, A., & McIntosh, W. D. (1993). Wanting but not having: The effects of unattained goals on thoughts and feelings. In D. M. Wegner & A. J. W. Pennebake (Eds.), *Handbook of mental control* (pp. 552–572). Englewood Cliffs, NJ: Prentice Hall.

Mead, N. L., Baumeister, R. F., Stillman, T. F., Rawn, C. D., & Vohs, K. D. (2011). Social exclusion causes people to spend and consume strategically in the service of affiliation. *Journal of Consumer Research, 37,* 902–919. http://dx.doi.org/10.1086/656667

Milyavskaya, M., Inzlicht, M., Hope, N., & Koestner, R. (2015). Saying "no" to temptation: Want-to motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology, 109,* 677–693. http://dx.doi.org/10.1037/pspp0000045

Mischel, W., & Ebbesen, E. B. (1970). Attention in delay of gratification. *Journal of Personality and Social Psychology, 16,* 329–337. http://dx.doi.org/10.1037/h0029815

Mischel, W., & Moore, B. (1973). Effects of attention to symbolically presented rewards on self-control. *Journal of Personality and Social Psychology, 28,* 172–179. http://dx.doi.org/10.1037/h0035716

Moors, A., & De Houwer, J. (2001). Automatic appraisal of motivational valence: Motivational affective priming and Simon effects. *Cognition and Emotion, 15,* 749–766. http://dx.doi.org/10.1080/02699930143000293

Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74,* 774–789. http://dx.doi.org/10.1037/0022-3514.74.3.774

Myrseth, K. O. R., Fishbach, A., & Trope, Y. (2009). Counteractive self-control. *Psychological Science, 20,* 159–163. http://dx.doi.org/10.1111/j.1467-9280.2009.02268.x

O'Donoghue, T., & Rabin, M. (1999). Doing it now or later. *The American Economic Review, 89,* 103–124. http://dx.doi.org/10.1257/aer.89.1.103

Papies, E. K., & Hamstra, P. (2010). Goal priming and eating behavior: Enhancing self-regulation by environmental cues. *Health Psychology, 29,* 384–388. http://dx.doi.org/10.1037/a0019877

Papies, E. K., Stroebe, W., & Aarts, H. (2008). The allure of forbidden food: On the role of attention in self-regulation. *Journal of Experimental Social Psychology, 44,* 1283–1292. http://dx.doi.org/10.1016/j.jesp.2008.04.008

Pessiglione, M., Schmidt, L., Draganski, B., Kalisch, R., Lau, H., Dolan, R. J., & Frith, C. D. (2007). How the brain translates money into force: A neuroimaging study of subliminal motivation. *Science, 316,* 904–906. http://dx.doi.org/10.1126/science.1140459

Rachlin, H. (2000). *The science of self-control*. Cambridge, MA: Harvard University Press.

Rohrer, D., & Wixted, J. T. (1994). An analysis of latency and interresponse time in free recall. *Memory & Cognition, 22,* 511–524. http://dx.doi.org/10.3758/BF03198390

Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). Forgetting all else: On the antecedents and consequences of goal shielding. *Journal of Personality and Social Psychology, 83,* 1261–1280. http://dx.doi.org/10.1037/0022-3514.83.6.1261

Shah, J. Y., & Kruglanski, A. W. (2002). Priming against your will: How accessible alternatives affect goal pursuit. *Journal of Experimental Social Psychology, 38,* 368–383. http://dx.doi.org/10.1016/S0022-1031(02)00005-7

Strahan, E. J., Spencer, S. J., & Zanna, M. P. (2002). Subliminal priming and persuasion: Striking while the iron is hot. *Journal of Experimental Social Psychology, 38,* 556–568. http://dx.doi.org/10.1016/S0022-1031(02)00502-4

Stroebe, W., Mensink, W., Aarts, H., Schut, H., & Kruglanski, A. W. (2008). Why dieters fail: Testing the goal conflict model of eating. *Journal of Experimental Social Psychology, 44,* 26–36. http://dx.doi.org/10.1016/j.jesp.2007.01.005

Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy, 89,* 392–406. http://dx.doi.org/10.1086/260971

Tom, G., & Rucker, M. (1975). Fat, full, and happy: Effects of food deprivation, external cues, and obesity on preference ratings, consumption, and buying intentions. *Journal of Personality and Social Psychology, 32,* 761–766. http://dx.doi.org/10.1037/0022-3514.32.5.761

Trope, Y., & Fishbach, A. (2000). Counteractive self-control in overcoming temptation. *Journal of Personality and Social Psychology, 79,* 493–506. http://dx.doi.org/10.1037/0022-3514.79.4.493

van Koningsbruggen, G. M., Stroebe, W., & Aarts, H. (2011). Through the eyes of dieters: Biased size perception of food following tempting food primes. *Journal of Experimental Social Psychology, 47,* 293–299. http://dx.doi.org/10.1016/j.jesp.2010.10.012

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