Exerting Self-Control ≠ Sacrificing Pleasure

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Self-control is a prominent topic in consumer research, where it is often conceptualized as the abstinence from hedonic consumption. We examine whether this conceptualization accurately captures consumers' experiences of self-control conflicts/failures in light of seminal self-control theories in economics and psychology. Rejecting that notion, we argue that self-control failures are choices in violation of superordinate long-term goals accompanied by anticipated regret, rather than choices of hedonic over utilitarian consumption. This conceptualization has important methodological, theoretical, and practical implications. Methodologically, it highlights the need for experimental paradigms with higher construct validity. Theoretically, it helps elucidate how self-control is distinct from impatience and self-regulation. Practically, it provides a rich set of implications for deducing interventions on the individual and public policy level to help consumers exert self-control.

Keywords Anticipated regret; Delay of gratification; Goal conflict; Hedonic consumption; Impatience; Self-control; Self-regulation; Time-inconsistent preferences; Vices and virtues

Self-control is a prominent topic in consumer research; consumers' seemingly short-sighted behaviors such as overeating, undersaving, and procrastinating are exploited by companies, which exacerbates the deleterious consequences of such behaviors for society. The most prominent of these consequences is probably the growing obesity epidemic in many parts of the world. Because obesity is conceptualized as a consequence of consumers' lack of self-control (Duckworth, Milkman, & Laibson, 2018), many self-control studies are conducted in the realm of food consumption and investigate the impact of contextual factors, marketing stimuli, and individual consumer characteristics on the choice, purchase, and consumption of food. These studies generally conceptualize self-control as consumers' choice to refrain from hedonic consumption. In some studies, self-controlled consumers would abstain from hedonic consumption by choosing a utilitarian option instead; in other studies, they would do so by limiting the amount of hedonic food they consume.

While the "exerting self-control = sacrificing pleasure" conceptualization has been widely adopted (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Ferraro, Shiv, & Bettman, 2005; Milkman, 2012; Rottenstreich, Sood, & Brenner, 2007; Shiv & Fedorikhin, 1999), some researchers have

questioned whether it accurately captures self-control conflicts. Loewenstein (2018), for example, argues that also behaviors that are too far—rather than short-sighted, represent self-control problems, for example, workaholism or excessive frugality. So-called "tightwads" have difficulties enjoying consumption and need to exercise self-control to do so (Rick, Cryder, & Loewenstein, 2008). Likewise, Liu et al. (2015) assert that some consumers, the so-called "virtue-lovers," are not tempted by prototypical hedonic consumption opportunities at all.

We evaluate the appropriateness of the "exerting self-control = sacrificing pleasure" conceptualization by comparing it to seminal self-control theories, which define self-control as the sacrifice of short-term impulses in favor of more important long-term goals (Elster, 1977; Hoch & Loewenstein, 1991; Loewenstein, 1996; Loewenstein & Elster, 1992; Rachlin, 1995; Strotz, 1955; Thaler, 1980; Thaler & Shefrin, 1981; Wertenbroch, 1998). According to these theories, for hedonic consumption to represent a self-control failure, consumers need to consider it a violation of their superordinate long-term goals. This assumption, which is crucial for the construct validity of paradigms used to study self-control in consumption, is often left untested. We verified empirically to what extent the assumption is met by studies relying on this conceptualization and observed that the majority of consumers does not perceive the choice of a hedonic food over a utilitarian food as a self-control failure. Instead, consistent with the foundational theories of self-control, most consumers perceive choices that violate a superordinate long-term goal (whether hedonic or utilitarian) as self-control failures. These are choices that consumers expect to regret. These empirical observations bear important methodological implications for the study of self-control. We provide guidelines on how to increase the validity of the paradigms used for the assessment of self-control in consumption and demonstrate how to assess self-control failures as superordinate long-term goal violations using real choices. We then discuss the theoretical and practical implications for the study of self-control, which we demonstrate in an experiment using actual choices. We conclude with a discussion of policy implications for interventions aimed at helping consumers exert self-control.

The current conceptualization of self-control in consumption

In order to identify the dominant paradigms for the study of self-control in consumption, we reviewed twelve consumer behavior, psychology, and management journals from 1998 to 2018 for articles containing studies on self-control in food consumption (We searched Google scholar using the keyword "self-control." The outcome of this search also included articles that did not mention the word self-control in the main text, but cited relevant self-control literature. We selected all papers that a) measured self-control as a dependent variable, b) manipulated or measured self-control as an independent variable (e.g., Baumeister et al. 1998; Gal and Liu 2011; we did not include papers that tested only individual differences in self-control), and c) referred to the self-control literature and measured constructs analogous to self-control (e.g., self-regulation, choice or consumption of vices and virtues or healthy but not tasty and tasty but unhealthy options, or tempting vs. non-tempting foods). We screened out all studies not related to food consumption.): *Journal of Consumer Psychology, Journal of Consumer Research, Journal of Marketing Research, Marketing Science, Journal of Marketing, Marketing Letters, Management Science, Organizational Behavior and Human Decision Processes, Journal of Personality and Social Psychology, Journal of Experimental Psychology: General, Journal of Experimental Social Psychology,* and *Psychological Science*. Our search yielded a total number of 291 experiments reported in 125 articles (see Table 1 in the web appendix).

For each study that examined self-control in food consumption, we recorded whether real food items were used as stimuli, whether consumption was observed within the study, the operationalization of self-control (for example, choice of the hedonic vs. utilitarian option; amount consumed or purchased; calories of the chosen food; intention to consume), the specific stimuli used in the studies to represent self-control or lack thereof, whether the study assumes that the stimuli used correspond to participants' goal hierarchy, whether participants' goal hierarchy was measured and included in the analysis, whether participants goal hierarchy was manipulated, or whether only participants sharing the same goal hierarchy were recruited to participate. In 95.9% [279] of the studies we reviewed, the stimuli representing self-control failure are hedonic foods—also described as unhealthy, tempting, indulgent, affectively superior, tasty, vice, or want foods, and (or) the stimuli representing successful exertion of self-control are utilitarian foods—also described as healthy, nontempting, cognitively superior, less tasty, virtue, or should foods. Hedonic foods typically contain high amounts of sodium, fat, and/or sugar, such as chocolate, cake, chips, ice

cream, soft drinks, French fries, doughnuts, hamburgers, and pizza. Utilitarian foods are typically low in sodium, fat, and sugar, such as fruit salad, granola bars, apples, yoghurt, raisins, vegetables, salad, cereals, carrots, bananas, water, and fruit juice (in some cases, foods are believed to be low in sugar but actually contain large amounts of it, for example, granola bars). Table 1 in the web appendix reports all the stimuli used in these experiments.

In the prototypical experiment implementing this paradigm (featured in 52.2% of the studies reviewed), a variable hypothesized to enhance or inhibit self-control is manipulated between participants (e.g., ego depletion), and participants are subsequently given a choice, real or hypothetical, between two food items (e.g., Baumeister et al., 1998; Ferraro et al., 2005; Milkman, 2012; Rottenstreich et al., 2007; Shiv & Fedorikhin, 1999). One of the options is hedonic, tempting, and immediately gratifying but less healthy, for example, chocolate cake or pizza; the other option is utilitarian, not very appealing in the moment but ostensibly healthier. The effect of the manipulated variable on self-control is estimated as the difference in choice shares of the hedonic food across experimental conditions, such that choices of the hedonic food represent self-control failures. In variations of this paradigm (34.4% of the studies reviewed), participants are given the opportunity to eat a food ad libitum. The quantity of food eaten (actual or hypothetical) serves as the dependent variable, where higher amounts of hedonic, tempting foods consumed indicate lower levels of self-control, and higher amounts of utilitarian, and healthier foods consumed are interpreted as higher levels of self-control. Consumption amounts are in some cases operationalized as self-reported consumption frequency, or in other cases as purchase quantities (7.2% of the studies reviewed).

The idea implicit in these paradigms is that participants will perceive the food stimuli as relative vices and virtues (Wertenbroch, 1998; in some studies the two options are actually labeled "vice" and "virtue") which are defined as follows: A product X is a vice relative to product Y, and Y is a virtue relative to X, if $X >_{immediate} Y$ and $Y >_{delayed} X$ (the consumption of X is preferred now, and the consumption of Y is preferred later; p. 318–19). The choice between a vice and a virtue as per Wertenbroch's definition operationalizes self-control as a conflict between two opposing preferences, one that demands immediate gratification, the other focusing on more important long-term benefits. For example,

for a consumer who wants to lose weight but really likes pizza, pizza is a vice relative to a low-calorie salad, and the salad is a virtue relative to pizza. The consumer may be tempted to choose the pizza, but when later on examining her waistline she may prefer to have chosen the salad. Choosing the salad and focusing on the consequences of her choice hence implies self-control, and choosing the pizza denotes a self-control failure.

The experimental paradigms using such vice and virtue stimuli, however, rarely define what represents self-control (or a lack thereof) based on consumers' goals. Instead, vices have been equated with hedonic goods and virtues with utilitarian goods: ". . .by Wertenbroch's (1998) formal definition, hedonic goods could be characterized as vices and utilitarian goods as virtues in a direct comparison with each other" (Khan, Dhar, & Wertenbroch, 2005, p. 20; cf. also Alba & Williams, 2013; Milkman, Rogers, & Bazerman, 2008, 2010; Mishra & Mishra, 2011; O'Curry & Strahilevitz, 2001; Okada, 2005; Read, Loewenstein, & Kalyanaraman, 1999). By equating vices with hedonic and virtues with utilitarian consumption, it is assumed that pleasure (taste) and health are the conflicting goals that consumers trade-off, with pleasure being valued more in the immediate, and health being valued more in the long run. Almost two-thirds of the 291 experiments reviewed (66.3%) rely on this assumption.

To test whether consumers perceive the choice of a hedonic option over a utilitarian option as a self-control failure, we conducted a scenario-based experiment. (A full description of all the experiments is reported in the web appendix. For all experiments, we preregistered sample size, hypotheses, and analyses. All datasets, stimuli, and preregistrations can be accessed here: https://osf. io/ynwrv/.) Participants ($N = 413$) read the following: *Imagine Mr. A is having dinner at a restaurant. He just finished his main course and is thinking about desserts. He has two options for dessert, a chocolate cake or a fruit salad.* They then read either that Mr. A had chosen the chocolate cake (hedonic choice condition) or that he had chosen the fruit salad (utilitarian choice condition) and indicated whether they thought Mr. A would see his choice as a self-control failure (three response options: *yes, no,* and *I am not sure*).

The majority of participants in both conditions believed that—as we had predicted—Mr. A would *not* see his choice as a self-control failure, whether he had chosen the chocolate cake (61.5%) or the fruit salad (85.2%; both proportions are significantly greater than 50%, $z = 3.29$, $p < .001$, and $z = 10.03$,

$p < .001$, respectively). Only a minority of participants (13.7%) considered Mr. A's choice to be a self-control failure.

These results show that consumers (or at least participants in our study) seem to disagree with the conceptualization of self-control failures as the choice of hedonic foods. The absolute majority of participants perceived neither choice to be indicative of a self-control failure. In the following section, we will review the foundational theories of self-control, and then test whether their original conceptualization captures better consumers' perceptions of self-control conflicts and failures.

What is self-control?

Self-control describes the sacrifice of immediate, short-term gratification in service of more important, long-term benefits (Elster, 1977; Hoch & Loewenstein, 1991; Loewenstein, 1996; Loewenstein & Elster, 1992; Metcalfe & Mischel, 1999; Rachlin, 1995; Strotz, 1955; Thaler, 1980; Thaler & Shefrin, 1981; Wertenbroch, 1998). All theories of self-control are based on this idea of opposing preferences, and many authors, starting with Sigmund Freud, have conceptualized them as a conflict between different selves within a person. In Freud's theory, the self consists of three parts: the id, the super-ego, and the ego. The id demands immediate gratification of its sexual desires, the super-ego represents a person's conscience, and the ego mediates between the id and the super-ego. The ego tends to collaborate with the id, becoming a victim of the stronger super-ego, which condemns the ego and gives it a deep-seated feeling of guilt (Freud, 1923, p. 73).

In the spirit of Freud's representation of intrapersonal conflicts, Ainslie (1975) conceptualized self-control problems as conflicts between a "now" self and a "future" self. The "now" self prefers consuming a tempting good now, but the "future" self would regret having consumed the tempting good in the past (e.g., smokers typically regret their habit as they get older). The conceptualization of self-control as a conflict between multiple selves has been adopted in psychology, and later on in economics, management, and by some researchers in consumer behavior (e.g., Bazerman, Tenbrunsel, & Wade-Benzoni, 1998; Gul & Pesendorfer, 2001; Hoch & Loewenstein, 1991; Loewenstein & Thaler, 1989; Schelling, 1984). Thaler and Shefrin (1981), for example, use the framework of a principal-agent model, in which an atemporal, farsighted planner (the principal) attempts to regulate the behavior of a temporally situated, short-sighted doer (the agent).

Time-Inconsistency of Preferences

The conceptualization of self-control as two co-existing but opposing forces (or selves) implies that preferences change over time. (We use the terms 'force' and 'goal' interchangeably, and call instantiations of goals 'preferences'.) This inconsistency of preferences over time is the hallmark of self-control conflicts (Ainslie, 1975; Bazerman et al., 1998; Elster, 1977; Hoch & Loewenstein, 1991; Loewenstein & Thaler, 1989; Schelling, 1978; Strotz, 1955; Thaler & Shefrin, 1981; Trope & Fishbach, 2000). It can be formalized as hyperbolic discounting in which immediate consumption is disproportionally overweighed relative to future consumption (Frederick, Loewenstein, & O'Donoghue, 2002). While hyperbolic discounting can capture time-inconsistent preferences, it cannot account for consumers being tempted only by certain types of consumption, for example food or sex, but not by other types (Jimenez-Gomez, 2018; Loewenstein, 1996).) Because preferences are inconsistent over time, one expects to regret resolving a self-control conflict in favor of immediate gratification (Baumeister, 2002; Giner-Sorolla, 2001; Khan & Dhar, 2007; Magen & Gross, 2010; Ramanathan & Williams, 2007; Read et al., 1999; Thomas, Desai, & Seenivasan, 2010).

Hierarchy of Preferences

The hierarchy of preferences, or second-order preference (Frankfurt, 1971), is a second necessary characteristic of self-control conflicts. It denotes an asymmetry in the importance of the two opposing forces or selves. The importance of the self that demands immediate gratification fades quickly as time passes, giving way to the self that serves long-term goals. A dieter may yield to the temptation of having a cheesecake, but at the end of the evening will regret having eaten it. So, her/his long-term preference (a health-goal) is superordinate to her/his short-term preference (immediate gratification). Exerting self-control means resolving the self-control conflict in favor of superordinate long-term preferences (Fujita, 2011; Milyavskaya & Inzlicht, 2017; Myrseth, Fishbach, & Trope, 2009; Read, 2006; Wertenbroch, Vosgerau, & Bruyneel, 2008). This hierarchy characterizes all forms of self-control conflicts, whether they involve food or drug consumption, exercise (vs. laziness), sex, anger, aggression, etc. (Whether moral conflicts, for example pro-social

versus selfish behavior, involve this kind of preference hierarchy is the topic of an intense debate (see for example Achtziger, Alós-Ferrer, & Wagner, 2015; Martinsson, Mysrseth, & Wollbrant, 2012; Fehr & Schmidt, 2006).)

Behavioral conflicts that do not involve such a hierarchy are not self-control conflicts (Ainslie, 1975; Fujita, 2011). Imagine a consumer who decides to try a new gelato flavor and then realizes that s/he dislikes the new flavor, and regrets not sticking to her/his trusted choice of pistachio. Her/his regret indicates a change in preferences over time (i.e., her/his preferences are time-inconsistent). However, neither preference—exploration vs. risk-avoidance—is superordinate to the other. In absence of self-control, the consumer would not invariably resolve the conflict in favor of one course of action or the other. This conflict involves a change in preferences and it involves regret, but it is not a self-control conflict.

The gelato example raises an interesting question for the definition of self-control conflicts, that is, how to decide which goal is superordinate to the other. Stated differently, which self reflects a person's true preference, the one that demands immediate gratification or the one serving long-term goals? There is a host of philosophical theories trying to answer this question (for a very interesting and entertaining overview, see Read, 2006). Consequentialists like Bentham or Miller would argue that the self that maximizes total pleasure is the superordinate one. According to hyperbolic discounting (Strotz, 1955), the self that discounts more consistently (i.e., is less subject to an immediacy-effect) is the authentic self. Nozick (1993) argued that the true preference is the one that is held for the majority of time, whereas Elster (1977) suggested it is the self that can act strategically, that is, the self which can influence the other self (for example, through precommitment; Frankfurt, 1971 proposed a similar view).

Anticipated Regret

Self-control conflicts are characterized by hierarchical and conflicting short- and long-term goals. The goals are conflicting because the immediate gratification obtained from satisfying a short-term goal bears potential negative consequences, whereas satisfying the long-term goal does not. Smoking a cigarette provides pleasure to the smoker, but brings with it a sore throat immediately after smoking, and potentially cancer in the long term. Resolving the goal conflict in favor of immediate gratification will hence lead to regretting one's choice (Baumeister, 2002; Khan & Dhar, 2007; Read et al., 1999; Thomas et al., 2010). Regretting a consumption choice means that if that person were facing the same decision again, she would choose differently. Regret also entails an affective component resulting from the self-blame experienced when people realize that their present situation would have been better had they chosen differently (Zeelenberg, 1999; Zeelenberg & Pieters, 2007; Pieters & Zeelenberg, 2007).

When facing a self-control conflict, consumers expect to regret acting against their superordinate long-term interests, given that they often engage in self-control efforts in response to temptation (Ariely & Wertenbroch, 2002; Fishbach, Friedman, & Kruglanski, 2003; Fishbach & Trope, 2005; Freitas, Liberman, & Higgins, 2002; Gollwitzer & Moskowitz, 1996; Kivetz & Simonson, 2002a, 2002b; Metcalfe & Mischel, 1999; Trope & Fishbach, 2000; Wertenbroch, 1998). The expectation that one will regret yielding to a temptation is hence a clear marker that the behavior involved represents a self-control failure (Magen & Gross, 2010). Only if a consumer expects regretting the consumption of a food does her consumption decision represent a self-control failure. If she does not expect to regret consuming the food, she does not experience a self-control conflict, even if she ultimately decides to consume the food.

Note that it is the anticipation—rather than the postdecisional experience—of regret that is crucial for the experience of self-control conflicts and failures, as it involves the generation of prefactual upward counterfactual thoughts (Bagozzi, Baumgartner, Pieters, & Zeelenberg, 2000; Baumgartner, Pieters, & Bagozzi, 2008). In the aftermath of a self-control failure, consumers may activate defense mechanisms to justify or rationalize their behavior as not inconsistent with their superordinate long-term goals (Chun, Park, & Thomas, 2019); or they may not experience regret because they have not (yet) experienced the negative consequences of their superordinate long-term goal violation (Magen & Gross, 2010), or their long-term goals may change before they experience those consequences (Shah & Kruglanski, 2002). For example, a dieter may not observe an immediate weight increase after engaging in overeating or may decide losing weight is no longer an important goal (Wrosch, Scheier, Miller, Schulz, & Carver, 2003). So only if regret is anticipated at the moment of choice does that choice qualify as a self-control failure (Magen & Gross, 2010).

Of the 125 papers included in our literature review (cf., table in the web appendix), none measured anticipated regret, and only five measured postdecisional regret or an analogous emotion (i.e., remorse) in at least one experiment: Ramanathan and Williams (2007), Giner-Sorolla (2001), Mishra and Mishra (2011), Khan and Dhar (2007), and Thomas et al. (2010). In two of the papers (Giner-Sorolla, 2001; Ramanathan & Williams, 2007), regret was measured within a battery of negative self-conscious emotions.

With the goal to test whether the conceptualization stemming from the foundational theories of self-control resonates with how consumers perceive self-control failures, that is, as choices that violate one's long-term goals and that one expects to regret, we conducted another scenario-based experiment. We manipulated orthogonally whether choices are hedonic vs. utilitarian, and whether they do vs. do not violate a superordinate long-term goal that entails the anticipation of regret. The study tests two competing predictions, one reflecting the conceptualization of self-control as abstinence from hedonic consumption, the other in line with the conceptualization of self-control as the sacrifice of short-term goals in favor of more important long-term goals. According to the former, the choice of a hedonic option should more likely be seen as a self-control failure than the choice of a utilitarian option. According to the latter, any food choice should more likely to be seen as a self-control failure if it is inconsistent with the consumer's long-term goal and the consumer anticipates regretting that choice.

Participants ($N = 805$) were asked to imagine Mr. A choosing a dessert and randomly assigned to one of the four experimental conditions:

1. Hedonic-Choice, No Goal Conflict: *He really likes chocolate, and he is not concerned about his calorie-intake. He chooses the chocolate cake, and he is sure he won't regret his choice.*
2. Hedonic-Choice, Goal Conflict: *He really likes chocolate, but he is trying to limit his calorie intake. He chooses the chocolate cake, but he is sure he will regret his choice.*
3. Utilitarian-Choice, No Goal Conflict: *He really likes fresh fruit, and he has no problem with the consumption of acidic foods. He chooses the fruit salad, and he is sure he won't regret his choice.*
4. Utilitarian-Choice, Goal Conflict: *He really likes fresh fruit, but he suffers from chronic heartburn so his doctor told him to limit his consumption of*

acidic foods such as fruit. He chooses the fruit salad, but he is sure he will regret his choice.

Participants then indicated whether they thought Mr. A would see his choice as self-control failure (three response options: *yes*, *no*, and *I am not sure*). In support of the conceptualization of self-control as the sacrifice of short-term goals in favor of more important long-term goals, participants' self-control failure attributions to Mr. A (yes vs. no) were dramatically higher when his choice violated his superordinate long-term goal than when it did not, irrespective of whether his choice was hedonic (81.7% vs. 9.0%, $\beta = 4.25$, $p < .001$) or utilitarian (62.0% vs. 8.4%, $\beta = 3.25$, $p < .001$). The hedonic choice was perceived more as a self-control failure than the utilitarian choice only when it violated Mr. A's long-term goal (81.7% vs. 62.0%, $\beta = 1.06$, $p < .001$), but not when it did not (9.0% vs. 8.4%, $\beta = 0.06$, $p = .859$). (The attentive reader may think that the manipulations we used are heavy-handed and did not leave participants much choice but to respond in a way that would confirm our hypotheses. Regardless of whether that is the case or not, we would like to emphasize that our argument is fundamentally a theoretical one that does not depend on the empirical demonstrations of how consumers view self-control conflicts.).

A replication of this experiment ($N = 819$) that also included a manipulation of consumption amount (half a serving vs. two servings) provides further support to our conceptualization. The results of this study revealed that the effect of choice (hedonic vs. utilitarian) on self-control attributions was only significant when the choice represented a long-term goal violation and the consumption amount was high ($\beta = 0.80$, $p = .038$), but neither when the amount consumed was small ($\beta = 0.03$, $p = .925$), nor when the choice did not represent a long-term goal violation, irrespective of whether the amount consumed was large ($\beta = 0.72$, $p = .124$) or small ($\beta = 0.59$, $p = .241$).

Differences between the Two Conceptualizations of Self-Control

The results of the experiments we conducted indicate that to accurately capture consumers' self-control experience, self-control failures need to be conceptualized and represented as superordinate long-term goal violations that consumer expect to regret. In this section, we discuss the main differences between this conceptualization of self-control

and the one according to which self-control coincides with abstinence from hedonic consumption. The two conceptualizations differ with respect to the subjectivity of self-control conflicts, to the heterogeneity of consumers' goals and the differences in the trade-offs implied by those goals, and to their treatment of self-control anomalies.

Self-Control Conflicts Are Subjective

If self-control problems arise from the intrapersonal conflict of hierarchical and opposing short- and long-term goals, it follows that the experience of self-control conflicts is subjective (Fujita, 2011; Myrseth & Fishbach, 2009). Because a self-control failure implies violating a subjective superordinate long-term goal, what constitutes a self-control failure is also subjective. In order to make self-control attributions, access to the goal hierarchy generating the conflict is required. Hence, strictly speaking, only a consumer can say to experience a self-control problem. Observers cannot attribute self-control problems to someone else, even if they consider their behavior unhealthy or detrimental, unless they are aware of that person's goal hierarchy. Self-control is not choosing what is objectively better. Self-control enhances the likelihood of attaining a superordinate long-term goal, even if that goal is not functional (Fujita, 2011).

Not All Consumers Pursue the Same Superordinate Long-Term Goals (Heterogeneity of Goals)

Most studies of self-control in food consumption assume that all participants share the same goal hierarchy, represented by the conflicting short- and long-term goals of pleasure and health. Out of the 291 studies that we reviewed, 66.3% [193] rely on this assumption on participants' goals without providing evidence that the assumption holds. In any case in which participants' goal hierarchy is different from the assumed hierarchy, however, their behavior cannot be interpreted as a manifestation of self-control or as a self-control failure. Defining self-control failures as the choice of a hedonic option relies on the assumption that consumers not experiencing a self-control failure would inevitably choose the utilitarian option. There is, however, a multitude of reasons other than temptation why a consumer would choose one food over the other (cf. Fujita, 2011; Myrseth & Fishbach, 2009; Myrseth et al., 2009; Liu et al., 2015).

Consider the choice between pizza (hedonic option) and grilled chicken salad (utilitarian). A consumer may choose the former but not necessarily experience a self-control failure because she does not care about restraining her calorie intake, or because she is a vegetarian, or because she likes pizza more than salad. In all these cases, her preference ordering for the two options would not change depending on whether she evaluates the immediate or delayed consequences of her consumption. The two options do not pose a self-control conflict. Or imagine a struggling recently converted vegetarian who is tempted by the chicken but knows she will regret choosing it because her long-term goal is to avoid meat consumption. Her choosing the chicken, rather than the pizza, would represent a self-control failure.

There are notable exceptions to the assumption that all participants share the same goal hierarchy (e.g., Kivetz & Zheng, 2006; Touré-Tillery & Fishbach, 2015). In 45 of the 291 studies reviewed (15.5%), researchers have collected and included as moderators in their analyses a direct or indirect measure of the extent to which participants' goal hierarchy was consistent with the stimuli used (e.g., Hung & Labroo, 2011, Kivetz & Zheng, 2006; Touré-Tillery & Fishbach, 2015). For example, Kivetz and Zheng (2006, Study 1C) directly measured the extent to which the foods used in their study (i.e., chocolate cake and fruit salad) were consistent with participants' goal hierarchy. In line with our argument, participants who scored below the median on the goal-consistency measures, that is, who did not perceive eating the cake rather than the fruit salad as detrimental to their long-term goals, were not affected by the self-control manipulation ($z = 0.10$, $p = .92$). With a similar intent, in a small subset of the studies reviewed (12.0%) only participants holding the same goal hierarchy are recruited, typically dieters or restrained eaters (e.g., Fujita & Han, 2009), or researchers attempt to activate specific goals (11.3%), typically using priming manipulations (e.g., Laran, 2010).

Consumers May not Perceive Pleasure and Health to Be in Conflict

A related assumption that studies of self-control in food consumption rely on is that participants consider pleasure and health to be in direct conflict. Even though American consumers in general believe food tastiness and healthiness to be negatively correlated, so the better a food tastes the less healthy it is believed to be (Oakes, 2005; Raghunathan, Naylor, & Hoyer, 2006; Rozin, Ashmore, & Markwith, 1996), the correlation is weak and attitudes toward food

and food associations are not universally shared (cf., Cornil & Chandon, 2016a). In a recent cross-national survey conducted in the US, UK, France, and Belgium, consumers associated "unhealthy" only weakly with "tasty" (Cooremans, Geuens, & Pandelaere, 2017). Some consumers are "virtue lovers" (Liu et al., 2015) and exhibit the opposite pattern of associations as they perceive healthy food as tastier than unhealthy food. This has been observed for dieters (Irmak, Vallen, & Robinson, 2011) and French consumers (Werle, Trendel, & Ardito, 2013). These results call into question the assumption that choosing the utilitarian, healthier option necessarily requires the exertion of self-control.

Whether tastiness and healthiness are perceived to be in conflict also depends on what consumers mean by "healthiness." Healthiness can refer to at least two distinct food properties, promoting weight loss (e.g., low fat content) and promoting general health (e.g., antioxidant properties). American consumers perceive tastiness and dieting-properties of food to be strongly negatively correlated, but tastiness and general health promoting properties to be positively correlated (André, Chandon, & Haws, 2019). Japanese, Flemish Belgians, and French consumers seem less concerned about food and health than American consumers; they display lower agreement with the statement "food is as much a poison as it is a nutrient," lower levels of food-related worry, and less guilt associated with food consumption (Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999). Even within American consumers, major gender differences exist with respect to these associations (Rozin, Kabnick, Pete, Fischler, & Shields, 2003). In addition, social norms govern what constitutes good (healthy) and bad (unhealthy) foods, and these norms are constantly changing. For example, the Atkins diet, a diet almost exclusively consisting of protein in the form of meat, was very popular in the early 2000s and considered effective in promoting weight loss. Twenty years later, the consumption of many meats is considered unhealthy as they contain animal fat.

These individual and cross-cultural differences call into question the ubiquity of the trade-off between pleasure and health. To many consumers, choosing the hedonic vs. the utilitarian food option may denote a preference for that option rather than a breakdown in self-control.

Self-Control Does not Require Abstinence from Pleasure

Even if consumers experience pleasure and health to be in conflict, and these motives correspond to their short- and long-term goals, choosing the hedonic option may not denote a self-control failure. For example, a self-controlled consumer may choose a hedonic option over a utilitarian option without experiencing regret if she deems the cost of that single indulgence negligible (Myrseth & Fishbach, 2009, call this an "epsilon-cost" temptation). In choices like the ones featured in experimental studies of self-control, (e.g., the choice of a candy bar to take home, or a hypothetical choice), one might argue that a participant may not perceive the indulgence as being in conflict with her superordinate long-term dieting and health goals because the costs associated with the indulgence are so trivial. Therefore, claiming that participants who do not choose the utilitarian option lack self-control may mischaracterize their behavior (Berkman, Hutcherson, Livingston, Kahn, & Inzlicht, 2017; Milyavskaya & Inzlicht, 2017).

In a similar vein, one could argue that in the typical experiment measuring self-control as the choice share of the hedonic among a hedonic and a utilitarian option, choosing neither option would denote the strongest demonstration of self-control to minimize food intake. We are aware of only one paper, Townsend and Liu (2012), in which self-control studies included such a neither-choice option. The authors, however, did not interpret neither-choices as the strongest demonstration of self-control, but analyzed them together with choices of the utilitarian option.

Self-Control Anomalies

Defining self-control failures as violations of one's superordinate long-term goals accommodates behaviors that have previously been described as self-control anomalies (Loewenstein, 2018), for example, hyperopia (Haws & Poynor, 2008; Kivetz & Simonson, 2002b). Hyperopic consumers deprive themselves of indulgence and instead focus too much on acquiring and consuming utilitarian necessities, acting responsibly, and doing "the right thing." Hyperopic consumers are not tempted to indulge. Instead, they need to employ precommitment strategies such as choosing hedonic luxury items over cash of equal or greater value as rewards in loyalty programs in order to indulge (Kivetz & Simonson, 2002b). If self-control is equated with abstinence from hedonic consumption, hyperopia is difficult to account for and is typically described as an exception. When self-control failures are defined as violations of superordinate long-term goals, in contrast, hyperopic behavior can be described as involving an opposite preference

order. For example, hyperopic consumers may be tempted by frugality (i.e., this is their short-term goal) and need to exert effort to overcome their frugality and approach indulgence that would contribute to their well-being (indulgence is in line with their long-term best interests). In accordance with this view, hyperopia has been shown to lead to long-term regret (Kivetz & Keinan, 2006) and can be mitigated by making such long-term regret salient (Keinan & Kivetz, 2008).

Another example of behaviors that are difficult to account for under the assumption that self-control implies abstaining from indulgence is the tightwad vs. spendthrift continuum. Spendthrifts are consumers who have difficulties limiting their spending, whereas tightwads have the opposite problem, they find it difficult to spend money (Rick et al., 2008). For spendthrifts, saving money requires self-control as their short-term goal/impulse is spending it, for tightwads the opposite is true, spending money requires self-control as their short-term goal/impulse is frugality.

An Experimental Paradigm to Study Self-Control

In order to provide an exemplification of how the proposed conceptualization can be translated into an experimental paradigm that validly captures self-control conflicts and failures, we conducted an experiment with real choices at a university in Korea. In the study, we tested students' self-control in an academic achievement vs. leisure trade-off conflict, thereby generalizing our findings to a non-food-related domain. To test whether these students see academic achievement as a superordinate long-term goal and leisure (going to the movies) as a subordinate short-term goal, we first conducted a pretest. We then directly manipulated whether or not a leisure opportunity violated students' superordinate long-term goal of academic achievement and observed its effects on students' anticipated regret.

Pretest

Forty students (72.5% male; M_{age} = 19.58, SD = 1.75) volunteered to participate in a short study at the campus center. They completed a short survey that, apart from demographics and their favorite movie genre, asked two questions:

1. What is more important to you in general?
   a. Academic achievement (performing well in the exams).
   b. Watching movies.
2. If you hadn't planned anything for tonight, what would you enjoy more?
   a. Studying.
   b. Going to a movie.

The majority of students (90% [36]) indicated that, in general, academic achievement is more important to them than watching movies (test against equal distribution χ^2 (1) = 25.6, p < .001), but 92.5% [37] said they would enjoy going to a movie tonight more than studying (test against equal distribution χ^2 (1) = 28.9, p < .001). Looking at preferences within-subjects, 83% [33] showed this pattern indicative of time-inconsistent preferences, suggesting that academic achievement and leisure (i.e., going to the movies) constitute opposing long- and short-term goals for the majority of students at this university. The other seven students showed consistency in their preferences. Among these, four always preferred leisure over studying/academic achievement and three always preferred studying/ academic achievement over leisure.

Main Study

In the main study, we manipulated the presence of a self-control conflict between subjects. In exchange for participating in a short survey, participants were given a choice between a cinema movie voucher and a pen. The cinema movie voucher was worth ₩10,000 (approximately US$9), and the pen was worth ₩1,100 (approximately US$1). The cinema movie voucher was valid only on one particular day and was nontransferable. For participants in the self-control conflict present condition, it was valid on Saturday, October 13, for participants in the control condition, it was valid on Saturday, October 20, 2018. Because examinations for all undergraduate programs at the university were scheduled in the week from Monday, October 15 to Friday, October 19, the cinema voucher valid on Oct 13th posed a self-control conflict for students, choosing it would satisfy their short-term goal of leisurely enjoyment but impede achieving their superordinate long-term goal to study for examinations. No self-control conflict should be present when cinema vouchers were valid on the Saturday after examination week.

We predicted that participants would expect to regret the choice of the cinema voucher to a greater degree when it was valid before than after examination week, which would be indicative of participants having experienced a self-control conflict. The
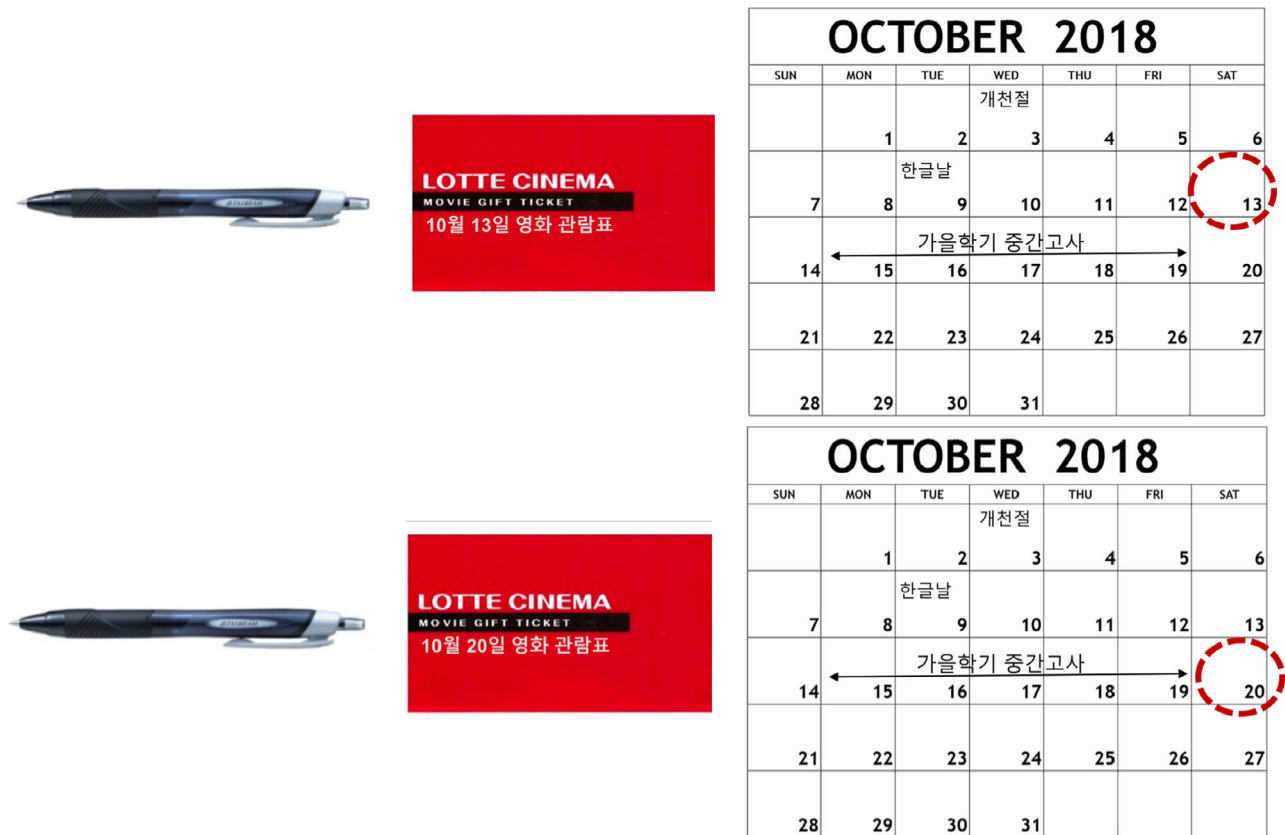
Figure 1. Stimuli used in the experiment.

choice of the cinema voucher that was valid before examination week would—according to our framework—constitute a self-control failure. Since there would be no long-term goal conflict for cinema vouchers that were valid after examination week, our framework predicts that at least as many participants as in the self-control conflict condition would choose it (we formulated this last prediction only after having preregistered the experiment and hypotheses).

Participants and Procedure

We employed a 2 (self-control conflict: yes vs. no) between-subjects design. Our aim was to recruit as many students as possible, with a minimum sample size of 100. One hundred and thirty students signed up to participate in one of the experimental sessions scheduled over three days about one week before the mid-term examination week. Of those, 93 students (M_{age} = 20.91, SD = 1.71; 59.1% male) showed up and participated, 7 short of the minimum that we had preregistered.

Participants were informed that they would participate in a brief (5-min) survey about product preferences and decision making; the survey was administered via computer. Specifically, participants were told *"In this study, you will choose between a pen and a movie voucher. The movie ticket is valid only on [Oct. 13th; Oct. 20th], Saturday 2018. Please note that it cannot be transferred to others (when you exchange the voucher to the ticket at the ticket office, your ID will be checked). You can use the movie voucher at any Lotte cinema branch on [October 13th, October 20th]. You will actually receive your choice as a thank-you gift for participating in the study after you finish the survey."*

Participants were then shown an image (Figure 1) depicting the pen, the cinema movie voucher, and a calendar in which the date for which the cinema voucher was valid was circled. In addition, the examination week and public holidays were marked.

Participants were then asked, *"Before you indicate your choice, please answer the following question. If you choose a movie ticket, how much do you think you would regret your choice later?"*, and given a 7-point

response scale with end points (1) *I don't think I would regret my choice at all*, and (7) *I think I will regret my choice*. (A reviewer noted that we could measure regret also for having chosen the pen, given that the pen was much cheaper than the cinema ticket, and its choice may have hence violated a financial well-being goal. Cinema tickets, however, were personalized with the name of the participant and were non-transferable, and could thus not be monetized. The value difference between the cinema ticket and the pen was thus perfectly confounded with the academic achievement versus enjoyment trade-off, and so regret for having chosen the pen should—theoretically—be a mirror image of regret for having chosen the cinema ticket.) Upon having answered that question, on the next screen page participants indicated their choice of cinema movie voucher or pen, their age, gender, and major. Finally, they were thanked and given their choice of movie voucher or pen. In the debriefing, we urged participants not to tell their friends and peers about the specifics of this study to prevent social comparisons/influence from contaminating the study results.

Results

As predicted, participants anticipated regretting choosing the movie voucher to a greater extent when vouchers were valid before examination week ($M_{\text{self-control conflict}} = 4.57$, $SD = 1.77$) than when vouchers were valid after examination week ($M_{\text{control}} = 3.18$, $SD = 1.53$, $t(91) = 4.03$, $p < .001$). Twenty-six out of 49 participants (53.1%) in the self-control conflict condition chose the cinema movie voucher, whereas 36 out of 44 participants in the control condition (81.8%) did so ($\chi^2(1) = 8.63$, $p = .003$).

Methodological Implications For Research In Self-Control

In the following, we use the design and results of this experiment to discuss some important methodological implications for the study of self-control. In particular, we explain how researchers can ensure that participants experience self-control conflicts and how to measure them, how to measure anticipated regret and self-control failures, whether to measure other emotions such as guilt, how to distinguish self-control from self-regulation, and, finally, how to distinguish self-control failures from impatience and willingness to delay gratification.

Ensuring that Participants Experience Self-Control Conflicts

For participants to experience a self-control conflict, it is necessary that choice options reflect their opposing and hierarchically ordered short- and long-term goals. This necessary condition can be tested in several ways. One way is to establish in a pretest that the majority of participants sees one choice option as satisfying a short-term goal and the other choice option as satisfying a conflicting but more important long-term goal. This is what we did in our pretest. An advantage of this method is that it is efficient and easy. A disadvantage is that it tests opposing short- and long-term goals only in the aggregate, so for a minority of participants the choice options may actually not correspond to short- and long-term goals (in our case, for 18% of the pretest sample studying vs. going to the movies did not constitute a self-control conflict).

Alternatively, for a specific choice set researchers could measure to what extent it involves a self-control conflict. This individual goal conflict index can then be included in the statistical analysis. An interaction with the manipulated factor of interest would be evidence for the factor of interest affecting self-control (cf., Hare, Camerer, & Rangel, 2009; Kivetz & Zheng, 2006). A third approach is to sample only participants who are known to share the same goal hierarchy. For example, Tian et al. (2018) either recruited only women with weight loss goals or allowed individuals to participate in the experiments only if they reported that they (a) had a goal of achieving and maintaining good health, (b) liked chocolate, and (c) ate health bars (chocolate and health bars were the stimuli used in the studies). Other researchers have recruited only restrained eaters (e.g., Fishbach & Dhar, 2005; Hur, Koo, & Hofmann, 2015).

Aligning choice options with participants' goal hierarchy by measuring those goals individually or in aggregate, or by recruiting participants who share the same superordinate long-term goals, however, is a necessary but not sufficient condition for the experience of a self-control conflict. To ensure that participants experienced a self-control conflict, it is also necessary to measure whether participants anticipate regretting the choice that violates their superordinate long-term goals. An experimenter may establish in a pretest that participants see the consumption of chocolate cake as tempting and at the same time as detrimental to their goal of maintaining a certain body shape and weight, but in the main experiment give participants the choice

between servings of chocolate cake and fruit salad that are very small. Even though the choice stimuli correspond to participants opposing short- and long-term goal, no self-control conflict would be experienced because the cost of the goal violation is small. A simple way to assess whether a choice would qualify as a self-control conflict is to measure whether participants would regret choosing the superordinate long-term goal-violating option.

Anticipated regret is a subjective experience that cannot be measured on ratio-scales; hence, only relative comparisons of anticipated regret can be interpreted. In other words, we can only say that participants in an experimental condition were more likely to experience a self-control conflict—or, equivalently, that they experienced a self-control conflict to a greater extent—than participants in another experimental condition.

Self-Control Failures: Superordinate Long-Term Goal Violation and Anticipated Regret

Choices that resolve a self-control conflict in favor of the short-term goal are self-control failures. In our experiment, 53.1% of participants in the self-control conflict condition displayed a failure to exert self-control, based on the assumption that for all participants in that condition the cinema movie voucher was both tempting and constituted an impediment to their superordinate long-term goal of academic success. Instead of establishing this in a pretest on a different sample drawn from the same population, we could have measured conflicting short- and long-term goals on an individual basis on the same sample that participated in the main experiment. Had we done so, in addition to measuring participants' anticipated regret, we could have been more confident in our claim that each participant having chosen the cinema movie voucher actually violated her/his superordinate long-term goal.

Note that in our experiment, participants could choose only one cinema voucher (or a pen), akin to experiments asking participants to choose between a hedonic and a utilitarian option. A disadvantage of using such binary choices is that the severity of self-control failures cannot be measured. If, instead of a binary choice, we had offered participants to choose as many cinema vouchers as they wanted to (assuming they could have watched several movies on a Saturday), we could have quantified to what extent our manipulation of self-control conflict had affected self-control failures. In food consumption studies, this can be achieved by measuring how much of a superordinate long-term goal-violating food is consumed. Differences in consumption amounts between an experimental and a control condition can be seen as an indicator of the severity of self-control failures. For example, if consumers' superordinate long-term goal is to consume more vegetables, a good measure of the effectiveness of an intervention to enhance self-control would be vegetable consumption per day. If consumers' long-term goal is a reduction in food intake, the amount of food/calories consumed would be appropriate (for a similar argument, see Wansink & Chandon, 2014). A statistical advantage of measuring actual consumption quantities is that they are continuous measures of self-control behavior, which implies higher sensitivity and more statistical power to detect effects.

Measuring Regret and Other Emotions

One may wonder why we focus on the measurement of anticipated regret. What about other emotions such as guilt, embarrassment, or disappointment that frequently accompany the experience of self-control failures (cf., Hoch & Loewenstein, 1991)?

Guilt is the unpleasant feeling associated with the recognition that one has violated a personally relevant, moral or ethical standard (Kugler & Jones, 1992; Tangney, Miller, Flicker, & Barlow, 1996). It has been conceptualized as an interpersonal phenomenon (Baumeister et al., 1994), often experienced in case of interpersonal harm (Zeelenberg & Breugelmans, 2008). Regret, on the other hand, is experienced in cases of both inter- and intrapersonal harm (Berndsen, Pligt, Doosje, & Manstead, 2004; Wagner, Handke, Dörfel, & Walter, 2012). Since self-control conflicts are intrapersonal conflicts, regret seems to be the more appropriate measure for the experience of self-control failures. To the extent that food consumption is governed by social norms, however, it may make sense to measure guilt in addition to regret. Guilt may even be a more sensitive measure of self-control conflicts if consumers have internalized the social norm (Baumeister et al., 1994; Zeelenberg & Breugelmans, 2008). The same reasoning holds for embarrassment and disappointment.

Concluding, we argue that anticipated regret is the primary definitional feature of breakdowns in self-control and is thus the most appropriate emotion-measure for self-control failures. Guilt, embarrassment, and disappointment may be additional or alternative measures of self-control failures in

contexts where the social norms governing food consumption are (a) known, (b) internalized by consumers to such an extent that they pretty much overlap with individuals' superordinate long-term goals, and (c) are shared and understood in the same way by all consumers.

Distinguishing Self-Control from Self-Regulation

Self-regulation is the ability to direct and monitor one's actions in order to meet certain standards or goals. An example of self-regulation is executive control in response conflicts such as responding in a Stroop task (Carver & Scheier, 1981; Norman & Shallice, 1986; Scheier & Carver, 1988). A breakdown in executive control—for example, a wrong response in the Stroop task—is undesirable both at its occurrence and at any later point in time (Fujita, 2011; Milyavskaya & Inzlicht, 2017). Response conflicts do not involve time-inconsistent preferences and hence do not classify as self-control conflicts (Saunders, Milyavskaya, Etz, Randles, & Inzlicht, 2018).

In our experiment, in contrast, participants in the self-control conflict condition exhibited time-inconsistent preferences, and they thus experienced a self-control conflict. We know this from two pieces of information: First, in the pretest the majority of participants indicated that, in general, academic achievement is more important than leisure, but—when choosing for tonight—they would rather choose watching a movie. Second, participants in the self-control conflict condition expected to regret the choice of the movie ticket to a greater extent than participants in the control condition.

Ego depletion theorists disagree and explicitly dismiss the distinction between self-control and self-regulation (Muraven, Tice, & Baumeister, 1998; Gailliot et al., 2007; Baumeister, Sparks, Stillman, & Vohs, 2008; see also Wertenbroch et al., 2008). According to these researchers, a mistake in the Stroop task is qualitatively similar to yielding to the temptation of choosing the cinema ticket, and the terms self-control and self-regulation are interchangeable.

We believe the theoretical distinction between self-control and self-regulation is important because it implies different psychological mechanisms underlying each class of behaviors. Interventions that are successful at moderating one class of behaviors may be ineffective at moderating the other class of behaviors and vice versa. For example, repeated practice is a very efficient way to improve most self-regulation behaviors, especially those that involve skill (Carver & Scheier, 1981;

Norman & Shallice, 1986; Scheier & Carver, 1988), but whether it is effective at improving self-control has been called into question (Miles et al., 2016). Providing monetary incentives for successful performance, in contrast, has been shown to help improve self-control in various domains, such as exercising (Charness & Gneezy, 2009), smoking cessation (Volpp et al., 2009), adherence to medication (Volpp et al., 2008), adherence to weight loss regimes (John et al., 2011), and food consumption (Schwartz et al., 2014). For self-regulation behaviors, incentivizing successful performance is not effective and can even have the opposite effect and lead to shirking, especially when monetary incentives are very large (Ariely, Gneezy, Loewenstein, & Mazar, 2009).

Distinguishing Self-Control Failures from Impatience and Willingness to Delay Gratification

Many behavioral researchers equate lack of self-control with impatience and unwillingness to delay gratification. Both impatience and unwillingness to delay gratification denote a preference for smaller but sooner rewards. Self-control, in contrast, involves a trade-off of a subordinate short-term goal, indicated by impatience, and a superordinate long-term goal, indicated by willingness to wait for the larger reward. For example, participants in the self-control conflict condition of our experiment who chose the movie ticket showed impatience or unwillingness to delay gratification, because they chose the sooner reward of watching a movie at the expense of studying for achieving academic excellence. Because they exhibited higher levels of anticipated regret than participants in the control condition, we can say that they also exhibited a lack of self-control. Had they not exhibited greater anticipation of regret, however, we would not be able to say so, because it could be that they perceived watching the movie as a negligible cost (Myrseth & Fishbach, 2009) that did not significantly affect their ability to study. Alternatively, they may not have cared that much about academic achievement compared to the enjoyment of watching a movie. In both cases, participants would not have shown a preference shift over time, and so their behavior would only indicate impatience or unwillingness to delay gratification but not a self-control failure (McGuire & Kable, 2013; Scholer & Higgins, 2010; Watts, Duncan, & Quan, 2018).

Concluding, impatience and unwillingness to delay gratification imply time-consistent preferences and denote rational behavior. They are distinct from lack of self-control, which is characterized by time-

inconsistent preferences, an irrational behavior. In this light, pursuing one's short-term goal denotes impatience but is not necessarily indicative of time-inconsistent preferences, unless that behavior induces regret.

General Discussion

Prompted by the nonreplicability of prominent findings in psychology and consumer behavior in the recent years, both fields have started to critically evaluate researchers' data collection methods, statistical tools, and transparency standards. We believe that the paradigms we use to test our theories deserve the same scrutiny. Theories and findings can be trusted only in so far as the experimental paradigms employed to test them truly capture the phenomena of interest. We believe the current predominant paradigm for studying self-control in consumer behavior deserves such a critical evaluation.

Following foundational theories on self-control conflicts in psychology and economics, we argued that superordinate long-term goal violations and anticipated regret—rather than abstinence from hedonic consumption—characterize self-control failures. Anticipated regret ensures that participants in an experiment actually experience a self-control conflict, and that, if they resolved the conflict in favor of their short-term goal, their choice/consumption behavior represents a self-control failure. We suggest that empirical studies of self-control in consumption adopt this conceptualization.

If anticipated regret is a necessary qualifier to accurately capture self-control conflicts and failures, it would be legitimate to ask what has been tested by self-control experiments that did not incorporate a measure of anticipated regret. We certainly have no definitive answer (since this is an empirical question), but we invite the reader to entertain the following possibilities.

Experiments Actually Tested Self-control

To the extent to which the choice options featured by the experimental paradigm corresponded to participants' goal hierarchy (e.g., in experiments in which restrained eaters were recruited; Fishbach & Dhar, 2005; Hur et al., 2015), abstinence or restraint from (hedonic) consumption would provide an appropriate test of self-control. What is missing in these experiments is an ultimate test of whether participants truly experienced a self-control conflict (and failure), that is, a demonstration that

participants expected to regret their choice or behavior. It may be informative to replicate extant self-control studies and include anticipated regret to test whether this is indeed the case, particularly in cases in which the cost of the superordinate goal violation is small (e.g., the choice of a snack to take home, or a hypothetical choice between two foods).

Experiments Tested Different Effects

Another possibility is that the choices featured by these experiments did not correspond to participants' underlying short- and long-term goals, and hence the observed effects do not represent effects on self-control but on something else. For example, ego-depleting tasks are typically perceived as more effortful than comparable tasks in control conditions (Kurzban, Duckworth, Kable, & Myers, 2013). So it could be that participants' subsequent choice of a hedonic food (e.g., chocolate) may represent a reward for having exerted effort rather than constituting a self-control failure. Measuring anticipated regret in such cases would help distinguishing self-reward choices from true self-control failures.

Experiments Relied On Stereotypical Food Perceptions

A third possibility, particularly likely for studies in which participants make hypothetical or nonbinding choices between the options (e.g., they chose but were not required to consume the food), is that the stimuli represented common food perceptions or food stereotypes. For example, most consumers agree that chocolate is less healthy than apples, pizza is less healthy than salad, and in general hedonic foods are less healthy than utilitarian foods. If stimuli are pretested in such a fashion, a researcher may conclude that her/his stimuli correspond to a specific hierarchy of short- and long-term goals. Without measures of anticipated regret, however, it is impossible to tell whether participants really experienced a self-control conflict and hedonic choices represented self-control failures.

Heterogeneous Manipulations and Inconsistent Experimental Paradigms Make it Difficult to Draw General Conclusions

The final (and most pessimistic) possibility is that it is difficult to draw generalizable conclusions from extant findings on self-control, because of the nature of the manipulations and of the heterogeneity of the paradigms used. Many studies on self-control used ego depletion manipulations, however, ego

depletion effects could not be replicated in highly-powered many laboratory replication attempts (Hagger et al., 2016; cf., also Carter, Kofler, Forster, & McCullough, 2015). If the existence of ego depletion is under question, it may be problematic to speculate on what caused the effects that were observed in these studies. One (benign) interpretation would be that the manipulations caused cognitive fatigue. Another interpretation could be that the reported effects are type-I errors.

Furthermore, self-control studies have used a multitude of experimental paradigms, even within the same paper. A first study, for example, may ask participants (male and female) to choose between a chocolate cookie and a fruit salad without determining participants' goal hierarchies; in a second study, only women may be recruited as they are argued to be more likely to have a dieting goal; in a third study, both male and female participants may be recruited and their chronic self-control measured on the individual level. If that measure interacts with the manipulation it is reported as supporting evidence for a self-control effect, if it does not have an effect it is not further discussed. Individual differences diagnostic of participants' goal hierarchy may be measured (for example, having a weight loss goal), and sometimes used (correctly) as a moderator, other times (incorrectly) as a covariate. Given these idiosyncrasies observed in the literature, it appears to us that conclusions can only be drawn from individual studies whose manipulations are reliable and experimental paradigms are consistent.

Relevance for Practitioners and Consumers

Interventions equating self-control with abstinence from hedonic consumption would be geared toward discouraging consumers from consuming certain foods. Instead of requiring consumers to internalize the long-term goal associated with the behavior targeted by the intervention, these interventions would simply direct consumers toward specific choices and behaviors.

We question whether consumer behavior researchers and psychologists have the expertise to be in a position to tell consumers what to eat or to define what constitutes a healthy lifestyle. This task falls within the expertise of nutritionists, biologists, and medical professionals. These professionals can determine which foods in which quantities are objectively good or bad for us, provide recommendations regarding consumption amounts, and advice consumers on their ideal level of physical activity, etc.

The task of consumer behavior researchers and psychologists, we believe, is to study the antecedents and consequences of the experience of self-control conflicts and failures. From this research, we can glean important insights on how to help consumers align their goals and actual behavior with objective criteria of a healthy lifestyle. For example, consumer behavior researchers can devise interventions that motivate consumers to consider the long-term consequences of their actions. They can design interventions that facilitate the anticipation of regret. They can help consumers realize that they have a self-control problem. The importance of the subjectivity of self-control conflicts is reflected in the old adage in clinical psychology that one cannot help a patient who does not believe to have a problem. In psychoanalysis, egosyntonic personality disorders are defined by behaviors, values, and feelings that are in harmony with the ego. Egodystonic thoughts and behaviors, in contrast, are in conflict with the ego and the person's ideal self-image. Egodystonic disorders are relatively easy to treat as the patient is in distress and experiences a desire to change. Egosyntonic disorders, in contrast, are very difficult to treat as the patient does not recognize having a problem and hence does not see any need to modify her/his behavior (Palombo, Bendicsen, & Koch, 2009).

Consumer behavior researchers and psychologists can also encourage consumers to view their food consumption as part of a holistic consumption episode rather than as isolated consumption instances. They can help design choice architectures that make superordinate long-term goals more salient and minimize the influence of short-term goals and impulsivity. They can help consumers employ the eight strategies to enhance self-control devised by Hoch and Loewenstein (1991): avoiding the desired object, postponing its acquisition and distraction, substituting the desired object with a less tempting one, precommitment, economic cost assessment (making the negative consequences of immediate consumption salient), time binding (making the positive consequences of delaying consumption salient), bundling costs (increasing the negative consequences of immediate consumption), referring to a higher authority or principle, and enhancing feelings of regret and guilt.

Based on our theorizing, it should also be easier to exert self-control when abandoning the idea that hedonic consumption represents a self-control failure. For example, rather than categorizing foods into good and bad, consumers could train themselves to use relative quantities as a benchmark for harmful consumption. Rationing portion sizes and consumption frequency are indeed powerful strategies to limit

food intake because how much we eat is as much governed by a food's tastiness as by serving size (Cornil & Chandon, 2016b; Young & Nestle, 2002, 2012). Rozin et al. (2003) have shown that, compared to the US, French portion sizes are smaller in comparable restaurants, in supermarkets, and in cookbooks. Importantly, sizes of other items in supermarkets do not differ between the US and France. The authors conclude "Ironically, although the French eat less than Americans, they seem to eat for a longer period of time, and hence have more food experience. The French can have their cake and eat it as well." (p. 450). In the same vein, Loewenstein (2018, p. 100) argues that "the best policies for combatting problems such as obesity and undersaving are not those that enhance self-control but those that remove the need for it."

Finally, consumers may be able to directly reduce the desirability of a food by changing their preferences (cf., Keinan, Kivetz, & Netzer, 2016; Myrseth et al., 2009; Raghunathan et al., 2006; Woolley & Fishbach, 2016). It may be possible to train oneself to reduce liking of foods that are full of salt, fat, and sugar, and instead to start liking foods that are usually considered virtues, such as vegetables, salads, fish, and seafood. In other words, consumers may be successful in changing their perception of foods such that tastiness and healthiness become positively correlated: The healthier the food the more pleasure is derived from eating it (Zajonc & Markus, 1982). Another way to change one's preferences may be to acknowledge that eating pleasure is not solely derived from short-term visceral impulses such as the consumption of salt, fat, and sugar. Drawing on research on the social and cultural dimensions of eating, Cornil and Chandon (2016a) define "Epicurean eating pleasure" as the enduring pleasure derived from the aesthetic appreciation of the sensory and symbolic value of food. Interestingly, this would also be more in accordance with the original meaning of the word "virtue." In Aristotelian ethics, man does not engage in virtuous acts by *forgoing* pleasure, rather, *pleasure is derived* from acting virtuously (https://en.wikipedia.org/wiki/Nicomachean_Ethics).

REFERENCES

Achtziger, A., Alós-Ferrer, C., & Wagner, A. K. (2015). Money, depletion, and prosociality in the dictator game. *Journal of Neuroscience, Psychology, and Economics*, *8*, 1–14. https://doi.org/10.1037/npe0000031

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

Alba, J. W., & Williams, E. F. (2013). Pleasure principles: A review of research on hedonic consumption. *Journal of Consumer Psychology*, *23*, 2–18. https://doi.org/10.1016/j.jcps.2012.07.003

André, Q., Chandon, P., & Haws, K. (2019). Healthy Through presence or absence, nature or science?: A framework for understanding front-of-package food claims. *Journal of Public Policy & Marketing*, *38*, 172–191. https://doi.org/10.1177/0743915618824332

Ariely, D., Gneezy, U., Loewenstein, G., & Mazar, N. (2009). Large stakes and big mistakes. *The Review of Economic Studies*, *76*, 451–469. https://doi.org/10.1111/j.1467-937X.2009.00534.x

Ariely, D., & Wertenbroch, K. (2002). Procrastination, deadlines, and performance: Self-control by precommitment. *Psychological Science*, *13*, 219–224. https://doi.org/10.1111/1467-9280.00441

Bagozzi, R. P., Baumgartner, H., Pieters, R., & Zeelenberg, M. (2000). The role of emotions in goal-directed behavior. In S. Ratneshwar, D. G. Mick, & C. Huffman (Eds), *The why of consumption: Contemporary perspectives on consumer motives, goals, and desires* (pp. 36–58). New York, NY: Routledge.

Baumeister, R. F. (2002). Yielding to temptation: Self-control failure, impulsive purchasing, and consumer behavior. *Journal of Consumer Research*, *28*, 670–676. https://doi.org/10.1086/338209

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, *74*, 1252–1265.

Baumeister, R. F., Sparks, E. A., Stillman, T. F., & Vohs, K. D. (2008). Free will in consumer behavior: Self-control, ego depletion, and choice. *Journal of Consumer Psychology*, *18*, 4–13. https://doi.org/10.1016/j.jcps.2007.10.002

Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1994). Guilt: An interpersonal approach. *Psychological Bulletin*, *115*, 243–267. https://doi.org/10.1037/0033-2909.115.2.243

Baumgartner, H., Pieters, R., & Bagozzi, R. P. (2008). Future-oriented emotions: Conceptualization and behavioral effects. *European Journal of Social Psychology*, *38*, 685–696. https://doi.org/10.1002/ejsp.467

Bazerman, M. H., Tenbrunsel, A. E., & Wade-Benzoni, K. (1998). Negotiating with yourself and losing: Making decisions with competing internal preferences. *Academy of Management Review*, *23*, 225–241. https://doi.org/10.5465/amr.1998.533224

Berkman, E. T., Hutcherson, C. A., Livingston, J. L., Kahn, L. E., & Inzlicht, M. (2017). Self-control as value-based choice. *Current Directions in Psychological Science*, *26*, 422–428. https://doi.org/10.1177/0963721417704394

Berndsen, M., van der Pligt, J., Doosje, B., & Manstead, A. (2004). Guilt and regret: The determining role of interpersonal and intrapersonal harm. *Cognition and*

Emotion, *18*, 55–70. https://doi.org/10.1080/02699930244000435

Carter, E. C., Kofler, L. M., Forster, D. E., & McCullough, M. E. (2015). A series of meta-analytic tests of the depletion effect: Self-control does not seem to rely on a limited resource. *Journal of Experimental Psychology: General*, *144*, 796–815. https://doi.org/10.1037/xge0000083

Carver, C. S., & Scheier, M. F. (1981). The self-attention-induced feedback loop and social facilitation. *Journal of Experimental Social Psychology*, *17*, 545–568. https://doi.org/10.1016/0022-1031(81)90039-1

Charness, G., & Gneezy, U. (2009). Incentives to exercise. *Econometrica*, *77*, 909–931.

Chun, H. H., Park, J., & Thomas, M. (2019). Cold anticipated regret versus hot experienced regret: Why consumers fail to regret unhealthy consumption. *Journal of the Association for Consumer Research*, *4*, 125–135. https://doi.org/10.1086/702622

Cooremans, K., Geuens, M., & Pandelaere, M. (2017). Cross-national investigation of the drivers of obesity: Re-assessment of past findings and avenues for the future. *Appetite*, *114*, 360–367. https://doi.org/10.1016/j.appet.2017.04.010

Cornil, Y., & Chandon, P. (2016a). Pleasure as an ally of healthy eating? Contrasting visceral and Epicurean eating pleasure and their association with portion size preferences and wellbeing. *Appetite*, *104*, 52–59. https://doi.org/10.1016/j.appet.2015.08.045

Cornil, Y., & Chandon, P. (2016b). Pleasure as a substitute for size: How multisensory imagery can make people happier with smaller food portions. *Journal of Marketing Research*, *53*, 847–864. https://doi.org/10.1509/jmr.14.0299

Duckworth, A. L., Milkman, K. L., & Laibson, D. (2018). Beyond willpower: Strategies for reducing failures of self-control. *Psychological Science in the Public Interest*, *19*, 102–129. https://doi.org/10.1177/1529100618821893

Elster, J. (1977). Ulysses and the sirens: A theory of imperfect rationality. *Information (International Social Science Council)*, *16*, 469–526. https://doi.org/10.1177/053901847701600501

Fehr, E., & Schmidt, K. M. (2006). The economics of fairness, reciprocity and altruism–experimental evidence and new theories. *Handbook of the Economics of Giving, Altruism and Reciprocity*, *1*, 615–691.

Ferraro, R., Shiv, B., & Bettman, J. R. (2005). Let us eat and drink, for tomorrow we shall die: Effects of mortality salience and self-esteem on self-regulation in consumer choice. *Journal of Consumer Research*, *32*, 65–75. https://doi.org/10.1086/429601

Fishbach, A., & Dhar, R. (2005). Goals as excuses or guides: The liberating effect of perceived goal progress on choice. *Journal of Consumer Research*, *32*, 370–377. https://doi.org/10.1086/497548

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

Fishbach, A., & Trope, Y. (2005). The substitutability of external control and self-control. *Journal of Experimental Social Psychology*, *41*, 256–270. https://doi.org/10.1016/j.jesp.2004.07.002

Frankfurt, H. G. (1971). Freedom of the will and the concept of a person. *The Journal of Philosophy*, 5–20. https://doi.org/10.2307/2024717

Frederick, S., Loewenstein, G., & O'donoghue, T. (2002). Time discounting and time preference: A critical review. *Journal of Economic Literature*, *40*, 351–401. https://doi.org/10.1257/jel.40.2.351

Freitas, A. L., Liberman, N., & Higgins, E. T. (2002). Regulatory fit and resisting temptation during goal pursuit. *Journal of Experimental Social Psychology*, *38*, 291–298. https://doi.org/10.1006/jesp.2001.1504

Freud, S. (1923). *Das Ich und das Es* (Internationaler Psychoanalytischer Verlag, Vienna, W. W. Norton & Company, New York).

Fujita, K. (2011). On conceptualizing self-control as more than the effortful inhibition of impulses. *Personality and Social Psychology Review*, *15*, 352–366. https://doi.org/10.1177/1088868311411165

Fujita, K., & Han, H. A. (2009). Moving beyond deliberative control of impulses: The effect of construal levels on evaluative associations in self-control conflicts. *Psychological Science*, *20*, 799–804. https://doi.org/10.1111/j.1467-9280.2009.02372.x

Gailliot, M. T., Baumeister, R. F., DeWall, C. N., Maner, J. K., Plant, E. A., Tice, D. M., . . . Schmeichel, B. J. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, *92*, 325–336. https://doi.org/10.1037/0022-3514.92.2.325

Giner-Sorolla, R. (2001). Guilty pleasures and grim necessities: affective attitudes in dilemmas of self-control. *Journal of Personality and Social Psychology*, *80*, 206–221. https://doi.org/10.1037/0022-3514.80.2.206

Gollwitzer, P., & Moskowitz, G. B. (1996). Goal effects on action and cognition. In N. Schwarz and G. L. Gore (Eds.), *Social psychology: Handbook of basic principles* (pp. 361–399). New York, NY: Guilford Press.

Gul, F., & Pesendorfer, W. (2001). Temptation and self-control. *Econometrica*, *69*, 1403–1435. https://doi.org/10.1111/1468-0262.00252

Hagger, M. S., Chatzisarantis, N. L. D., Alberts, H., Anggono, C. O., Batailler, C., Birt, A. R., . . . Zwienenberg, M. (2016). A multilab preregistered replication of the ego-depletion effect. *Perspectives on Psychological Science*, *11*, 546–573. https://doi.org/10.1177/1745691616652873

Hare, T. A., Camerer, C. F., & Rangel, A. (2009). Self-control in decision-making involves modulation of the vmPFC valuation system. *Science*, *324*, 646–648. https://doi.org/10.1126/science.1168450

Haws, K. L., & Poynor, C. (2008). Seize the day! Encouraging indulgence for the hyperopic consumer. *Journal of Consumer Research*, *35*, 680–691. https://doi.org/10.1086/592129

Hoch, S. J., & Loewenstein, G. F. (1991). Time-inconsistent preferences and consumer self-control. *Journal of Consumer Research*, *17*, 492–507. https://doi.org/10.1086/208573

Hur, J. D., Koo, M., & Hofmann, W. (2015). When temptations come alive: How anthropomorphism undermines self-control. *Journal of Consumer Research*, *42*, 340–358. https://doi.org/10.1093/jcr/ucv017

Irmak, C., Vallen, B., & Robinson, S. R. (2011). The impact of product name on dieters' and nondieters' food evaluations and consumption. *Journal of Consumer Research*, *38*, 390–405. https://doi.org/10.1086/660044

Jimenez-Gomez, D. (2018). *Hyperbolic discounting is not lack of self-control*. Available at SSRN 3259378.

John, L. K., Loewenstein, G., Troxel, A. B., Norton, L., Fassbender, J. E., & Volpp, K. G. (2011). Financial incentives for extended weight loss: A randomized, controlled trial. *Journal of General Internal Medicine*, *26*, 621–626. https://doi.org/10.1007/s11606-010-1628-y

Keinan, A., & Kivetz, R. (2008). Remedying hyperopia: The effects of self-control regret on consumer behavior. *Journal of Marketing Research*, *45*, 676–689. https://doi.org/10.1509/jmkr.45.6.676

Keinan, A., Kivetz, R., & Netzer, O. (2016). The functional alibi. *Journal of the Association for Consumer Research*, *1*, 479–496. https://doi.org/10.1086/688218

Khan, U., & Dhar, R. (2007). Where there is a way, is there a will? The effect of future choices on self-control. *Journal of Experimental Psychology: General*, *136*, 277–288. https://doi.org/10.1037/0096-3445.136.2.277

Khan, U., Dhar, R., & Wertenbroch, K. (2005). A behavioral decision theoretic perspective on hedonic and utilitarian choice. Ratneshwar. In S. Ratneshwar, & D. G. Mick (Eds), *Inside consumption: frontiers of research on consumer motives, goals, and desires* (pp. 144–165). New York, NY: Routledge.

Kivetz, R., & Keinan, A. (2006). Repenting hyperopia: An analysis of self-control regrets. *Journal of Consumer Research*, *33*, 273–282. https://doi.org/10.1086/506308

Kivetz, R., & Simonson, I. (2002a). Earning the right to indulge: Effort as a determinant of customer preferences toward frequency program rewards. *Journal of Marketing Research*, *39*, 155–170. https://doi.org/10.1509/jmkr.39.2.155.19084

Kivetz, R., & Simonson, I. (2002b). Self-control for the righteous: Toward a theory of precommitment to indulgence. *Journal of Consumer Research*, *29*, 199–217. https://doi.org/10.1086/341571

Kivetz, R., & Zheng, Y. (2006). Determinants of justification and self-control. *Journal of Experimental Psychology: General*, *135*, 572–587. https://doi.org/10.1037/0096-3445.135.4.572

Kugler, K., & Jones, W. (1992). On conceptualizing and assessing guilt. *Journal of Personality and Social Psychology*, *62*, 318–327. https://doi.org/10.1037/0022-3514.62.2.318

Kurzban, R., Duckworth, A. L., Kable, J. W., & Myers, J. (2013). An opportunity cost model of subjective effort and task performance. *Behavioral and Brain Sciences*, *36*, 661–679. https://doi.org/10.1017/S0140525X12003196

Laran, J. (2010). Choosing your future: Temporal distance and the balance between self-control and indulgence. *Journal of Consumer Research*, *36*, 1002–1015. https://doi.org/10.1086/648380

Liu, Peggy J., Kelly L. Haws, Cait Lamberton, Troy H. Campbell, and Gavan J. Fitzsimons (2015)."Vice-virtue bundles." *Management Science 61*(1), 204–228. https://doi.org/10.1287/mnsc.2014.2053

Loewenstein, G. (1996). Out of control: Visceral influences on behavior. *Organizational Behavior and Human Decision Processes*, *65*, 272–292. https://doi.org/10.1006/obhd.1996.0028

Loewenstein, G. (2018). Self-control and its discontents: a commentary on duckworth, milkman, and laibson. *Psychological Science in the Public Interest*, *19*, 95–101. https://doi.org/10.1177/1529100619828401

Loewenstein, G., & Elster, J. (Eds.) (1992). *Choice over time*. New York, NY: Russell Sage Foundation.

Loewenstein, G., & Thaler, R. H. (1989). Anomalies: Intertemporal choice. *Journal of Economic Perspectives*, *3*, 181–193. https://doi.org/10.1257/jep.3.4.181

Magen, E., & Gross, J. J. (2010). Getting our act together: Toward a general model of self-control. *Self-control in Society, Mind and Brain*, 335–353.

Martinsson, P., Myrseth, K. O. R., & Wollbrant, C. (2012). Reconciling pro-social vs. selfish behavior: On the role of self-control. *Judgment and Decision Making*, *7*, 304–315.

McGuire, J. T., & Kable, J. W. (2013). Rational temporal predictions can underlie apparent failures to delay gratification. *Psychological Review*, *120*, 395–410. https://doi.org/10.1037/a0031910

Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychological Review*, *106*, 3–19. https://doi.org/10.1037/0033-295X.106.1.3

Miles, E., Sheeran, P., Baird, H., Macdonald, I., Webb, T. L., & Harris, P. R. (2016). Does self-control improve with practice? Evidence from a six-week training program. *Journal of Experimental Psychology: General*, *145*, 1075–1091. https://doi.org/10.1037/xge0000185

Milkman, K. L. (2012). Unsure what the future will bring? You may overindulge: Uncertainty increases the appeal of wants over shoulds. *Organizational Behavior and Human Decision Processes*, *119*, 163–176. https://doi.org/10.1016/j.obhdp.2012.07.003

Milkman, K. L., Rogers, T., & Bazerman, M. H. (2008). Harnessing our inner angels and demons: What we have learned about want/should conflicts and how that knowledge can help us reduce short-sighted decision making. *Perspectives on Psychological Science*, *3*, 324–338. https://doi.org/10.1111/j.1745-6924.2008.00083.x

Milkman, K. L., Rogers, T., & Bazerman, M. H. (2010). I'll have the ice cream soon and the vegetables later: A study of online grocery purchases and order lead time. *Marketing Letters*, *21*, 17–35. https://doi.org/10.1007/s11002-009-9087-0

Milyavskaya, M., & Inzlicht, M. (2017). Attentional and motivational mechanisms of self-control. D. de Ridder, M. Adriaanse, & K. Fujita (Eds), *International handbook of self-control in health and well-being* (pp. 11–26). New York, NY: Routledge.

Mishra, A., & Mishra, H. (2011). The influence of price discount versus bonus pack on the preference for virtue and vice foods. *Journal of Marketing Research, 48,* 196–206. https://doi.org/10.1509/jmkr.48.1.196

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.

Myrseth, K. O. R., & Fishbach, A. (2009). Self-control: A function of knowing when and how to exercise restraint. *Current Directions in Psychological Science, 18,* 247–252. https://doi.org/10.1111/j.1467-8721.2009.01645.x

Myrseth, K. O. R., Fishbach, A., & Trope, Y. (2009). Counteractive self-control: When making temptation available makes temptation less tempting. *Psychological Science, 20,* 159–163. https://doi.org/10.1111/j.1467-9280.2009.02268.x

Norman, D. A., & Shallice, T. (1986). Attention to action. *Consciousness and self-regulation.* New York: Springer, 1–18.

Nozick, R. (1993). *The nature of rationality.* Princeton, NJ: Princeton University Press.

PietersOakes, M. E. (2005). Stereotypical thinking about foods and perceived capacity to promote weight gain. *Appetite, 44,* 317–324. https://doi.org/10.1016/j.appet.2005.03.010

O'Curry, S., & Strahilevitz, M. (2001). Probability and mode of acquisition effects on choices between hedonic and utilitarian options. *Marketing Letters, 12,* 37–49.

Okada, E. M. (2005). Justification effects on consumer choice of hedonic and utilitarian goods. *Journal of Marketing Research, 42,* 43–53. https://doi.org/10.1509/jmkr.42.1.43.56889

Palombo, J., Bendicsen, H. K., & Koch, B. J. (2009). *Guide to psychoanalytic developmental theories.* Berlin, Germany: Springer Science & Business Media.

Pieters, R., & Zeelenberg, M. (2007). A theory of regret regulation 1.1. *Journal of Consumer Psychology, 17,* 29–35. https://doi.org/10.1207/s15327663jcp1701_6

Rachlin, H. (1995). Self-control: Beyond commitment. *Behavioral and Brain Sciences, 18,* 109–121. https://doi.org/10.1017/S0140525X00037602

Raghunathan, R., Naylor, R. W., & Hoyer, W. D. (2006). The unhealthy= tasty intuition and its effects on taste inferences, enjoyment, and choice of food products. *Journal of Marketing, 70,* 170–184. https://doi.org/10.1509/jmkg.70.4.170

Ramanathan, S., & Williams, P. (2007). Immediate and delayed emotional consequences of indulgence: The moderating influence of personality type on mixed emotions. *Journal of Consumer Research, 34,* 212–223. https://doi.org/10.1086/519149

Read, D. (2006). Which side are you on? The ethics of self-command. *Journal of Economic Psychology, 27,* 681–693. https://doi.org/10.1016/j.joep.2006.04.005

Read, D., Loewenstein, G., & Kalyanaraman, S. (1999). Mixing virtue and vice: Combining the immediacy effect and the diversification heuristic. *Journal of Behavioral Decision Making, 12,* 257–273. https://doi.org/10.1002/(SICI)1099-0771(199912)12:4<257:AID-BDM327>3.0.CO;2-6

Rick, S. I., Cryder, C. E., & Loewenstein, G. (2008). Tightwads and spendthrifts. *Journal of Consumer Research, 34,* 767–782. https://doi.org/10.1086/523285

Rottenstreich, Y., Sood, S., & Brenner, L. (2007). Feeling and thinking in memory-based versus stimulus-based choices. *Journal of Consumer Research, 33,* 461–469. https://doi.org/10.1086/510219

Rozin, P., Ashmore, M., & Markwith, M. (1996). Lay American conceptions of nutrition: Dose insensitivity, categorical thinking, contagion, and the monotonic mind. *Health Psychology, 15,* 438–447. https://doi.org/10.1037/0278-6133.15.6.438

Rozin, P., Fischler, C., Imada, S., Sarubin, A., & Wrzesniewski, A. (1999). Attitudes to food and the role of food in life in the USA, Japan, Flemish Belgium and France: Possible implications for the diet–health debate. *Appetite, 33,* 163–180. https://doi.org/10.1006/appe.1999.0244

Rozin, P., Kabnick, K., Pete, E., Fischler, C., & Shields, C. (2003). The ecology of eating: Smaller portion sizes in France than in the United States help explain the French paradox. *Psychological Science, 14,* 450–454. https://doi.org/10.1111/1467-9280.02452

Saunders, B., Milyavskaya, M., Etz, A., Randles, D., & Inzlicht, M. (2018). Reported self-control is not meaningfully associated with inhibition-related executive function: A Bayesian analysis. *Collabra: Psychology, 4.* https://doi.org/10.1525/collabra.134

Scheier, M. F., & Carver, C. S. (1988). A model of behavioral self-regulation: Translating intention into action. In *Advances in experimental social psychology* (Vol. 21, pp. 303–346). Amsterdam, Netherlands: Academic Press/Elsevier.

Schelling, T. C. (1978). Egonomics, or the art of self-management. *The American Economic Review, 68,* 290–294.

Schelling, T. C. (1984). *Choice and consequence.* Cambridge, MA: Harvard University Press.

Scholer, A. A., & Higgins, E. T. (2010). Conflict and control at different levels of self-regulation. In R. R. Hassin, K. N. Ochsner, & Y. Trope (Eds.), *Oxford series in social cognition and social neuroscience. Self-control in society, mind, and brain* (pp. 312–334). New York, NY: Oxford University Press. http://doi.org/10.1093/acprof:oso/9780195391381.003.0017

Schwartz, J., Mochon, D., Wyper, L., Maroba, J., Patel, D., & Ariely, D. (2014). Healthier by precommitment. *Psychological Science, 25,* 538–546. https://doi.org/10.1177/0956797613510950

Shiv, B., & Fedorikhin, A. (1999). Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of Consumer Research, 26,* 278–292. https://doi.org/10.1086/209563

Strotz, R. H. (1955). Myopia and inconsistency in dynamic utility maximization. *The Review of Economic Studies*, 23, 165–180. https://doi.org/10.2307/2295722

Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt, and embarrassment distinct emotions? *Journal of Personality and Social Psychology*, 70, 1256–1269. https://doi.org/10.1037//0022-3514.70.6.1256

Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization*, 1, 39–60. https://doi.org/10.1016/0167-2681(80)90051-7

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

Thomas, M., Desai, K. K., & Seenivasan, S. (2010). How credit card payments increase unhealthy food purchases: Visceral regulation of vices. *Journal of Consumer Research*, 38, 126–139. https://doi.org/10.1086/657331

Tian, A. D., Schroeder, J., Häubl, G., Risen, J. L., Norton, M. I., & Gino, F. (2018). Enacting rituals to improve self-control. *Journal of Personality and Social Psychology*, 114, 851–876. https://doi.org/10.1037/pspa0000113

Touré-Tillery, M., & Fishbach, A. (2015). It was (n't) me: Exercising restraint when choices appear self-diagnostic. *Journal of Personality and Social Psychology*, 109, 1117–1131. https://doi.org/10.1037/a0039536

Townsend, C., & Liu, W. (2012). Is planning good for you? The differential impact of planning on self-regulation. *Journal of Consumer Research*, 39, 688–703. https://doi.org/10.1086/665053

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

Volpp, K. G., Loewenstein, G., Troxel, A. B., Doshi, J., Price, M., Laskin, M., & Kimmel, S. E. (2008). A test of financial incentives to improve warfarin adherence. *BMC Health Services Research*, 8, 272–272. https://doi.org/10.1186/1472-6963-8-272

Volpp, K. G., Troxel, A. B., Pauly, M. V., Glick, H. A., Puig, A., Asch, D. A., . . . Audrain-McGovern, J. (2009). A randomized, controlled trial of financial incentives for smoking cessation. *New England Journal of Medicine*, 360, 699–709. https://doi.org/10.1056/NEJMsa0806819

Wagner, U., Handke, L., Dörfel, D., & Walter, H. (2012). An experimental decision-making paradigm to distinguish guilt and regret and their self-regulating function via loss averse choice behavior. *Frontiers in Psychology*, 3, 431. https://doi.org/10.3389/fpsyg.2012.00431

Wansink, B., & Chandon, P. (2014). Slim by design: Redirecting the accidental drivers of mindless overeating. *Journal of Consumer Psychology*, 24, 413–431. https://doi.org/10.1016/j.jcps.2014.03.006

Watts, T. W., Duncan, G. J., & Quan, H. (2018). Revisiting the marshmallow test: A conceptual replication investigating links between early delay of gratification and later outcomes. *Psychological Science*, 29, 1159–1177. https://doi.org/10.1177/0956797618761661

Werle, C. O., Trendel, O., & Ardito, G. (2013). Unhealthy food is not tastier for everybody: The "healthy= tasty" French intuition. *Food Quality and Preference*, 28, 116–121. https://doi.org/10.1016/j.foodqual.2012.07.007

Wertenbroch, K. (1998). Consumption self-control by rationing purchase quantities of virtue and vice. *Marketing Science*, 17, 317–337. https://doi.org/10.1287/mksc.17.4.317

Wertenbroch, K., Vosgerau, J., & Bruyneel, S. D. (2008). Free will, temptation, and self-control: We must believe in free will, we have no choice (Isaac B. Singer). *Journal of Consumer Psychology*, 18, 27–33. https://doi.org/10.1016/j.jcps.2007.10.006

Woolley, K., & Fishbach, A. (2016). For the fun of it: Harnessing immediate rewards to increase persistence in long-term goals. *Journal of Consumer Research*, 42, 952–966. https://doi.org/10.1093/jcr/ucv098

Wrosch, C., Scheier, M. F., Miller, G. E., Schulz, R., & Carver, C. S. (2003). Adaptive self-regulation of unattainable goals: Goal disengagement, goal reengagement, and subjective well-being. *Personality and Social Psychology Bulletin*, 29, 1494–1508. https://doi.org/10.1177/0146167203256921

Young, L. R., & Nestle, M. (2002). The contribution of expanding portion sizes to the US obesity epidemic. *American Journal of Public Health*, 92, 246–249. https://doi.org/10.2105/AJPH.92.2.246

Young, L. R., & Nestle, M. (2012). Reducing portion sizes to prevent obesity: A call to action. *American Journal of Preventive Medicine*, 43, 565–568. https://doi.org/10.1016/j.amepre.2012.07.024

Zajonc, R. B., & Markus, H. (1982). Affective and cognitive factors in preferences. *Journal of Consumer Research*, 9, 123–131. https://doi.org/10.1086/208905

Zeelenberg, M. (1999). Anticipated regret, expected feedback and behavioral decision making. *Journal of Behavioral Decision Making*, 12, 93–106. https://doi.org/10.1002/(SICI)1099-0771(199906)12:2<93:AID-BDM311>3.0.CO;2-S

Zeelenberg, M., & Breugelmans, S. M. (2008). The role of interpersonal harm in distinguishing regret from guilt. *Emotion*, 8, 589–596. https://doi.org/10.1037/a0012894

Zeelenberg, M., & Pieters, R. (2007). A theory of regret regulation 1.0. *Journal of Consumer Psychology*, 17, 3–18. https://doi.org/10.1207/s15327663jcp1701_3

Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Appendix S1. Web Appendix.