Exerting Self-Control ≠ Sacrificing Pleasure

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ABSTRACT

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: self-control, hedonic consumption, goal conflict, vices and virtues, time-inconsistent preferences, anticipated regret, self-regulation, impatience, delay of gratification

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 et al., 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 et al., 1998; Shiv & Fedorikhin, 1999; Ferraro et al., 2005; Rottenstreich et al., 2007; Milkman, 2012), 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, 1984; Loewenstein, 1996; Rachlin, 1995; Thaler & Shefrin, 1981; Hoch & Loewenstein,

1991; Loewenstein & Elster, 1992; Strotz, 1956; Thaler, 1980; Wertenrboch, 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[1]:

[1] 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

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, non-tempting, 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

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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.

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; Shiv & Fedorikhin, 1999; Ferraro et al., 2005; Rottenstreich et al., 2007; Milkman, 2012). 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, 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, iff $X \succ_{\text{immediate}} Y$ and $Y \succ_{\text{delayed}} X$ (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, & Kalyaranaman, 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[2]. 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*

[2] 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 anonymized preregistrations can be accessed here: https://osf.io/ynwrv/.

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, 1984; Loewenstein, 1996; Rachlin, 1995; Thaler & Shefrin, 1981; Hoch & Loewenstein, 1991; Loewenstein & Elster, 1992; Strotz, 1956; Thaler, 1980; Wertenrboch, 1998; Metcalfe & Mischel, 1999). 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., Schelling, 1984; Loewenstein & Thaler, 1989; Hoch & Loewenstein, 1991; Bazerman, Tenbrunsel, & Wade-Benzoni, 1998; Gul & Pesendorfer, 2001). 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, shortsighted 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.[3] This inconsistency of preferences over time is the hallmark of self-control conflicts (Strotz, 1956; Ainslie, 1975; Elster, 1977; Schelling, 1978; Loewenstein & Thaler, 1989; Thaler & Shefrin, 1981; Bazerman et al., 1998; Hoch & Loewenstein, 1991; 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).[4] Because preferences are

[3] We use the terms 'force' and 'goal' interchangeably, and call instantiations of goals 'preferences'.
[4] While hyperbolic discounting can capture time inconsistent preferences, it cannot account for consumers being tempted only by certain types of consumption (e.g., food or sex) but not by others (Loewenstein, 1996; Jimenez-Gomez, 2018).

inconsistent over time, one expects to regret resolving a self-control conflict in favor of immediate gratification (Baumeister, 2002; Read, Loewenstein, & Kalyanaraman, 1999; Thomas, Desai, & Seenivasan, 2011; Ramanathan & Williams, 2007; Giner-Sorolla, 2001; Khan & Dhar, 2007; Magen & Gross, 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 (Wertenbroch, Vosgerau, & Bruyneel, 2008; Myrseth et al., 2009; Read, 2006; Fujita, 2011; Milyavskaya & Inzlicht, 2017). This hierarchy characterizes all forms of self-control conflicts, whether they involve food or drug consumption, exercise (vs. laziness), sex, anger, aggression, etc.[5]

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 versus risk-avoidance—is superordinate to the other. In absence of self-control, the consumer would not

[5] 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).

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, 1956), the self that discounts more consistently (i.e., is less subject to an immediacy-effect) is the authentic self. Nozik (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 pre-commitment; 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; Read, Loewenstein, & Kalyanaraman, 1999; Thomas, Desai, & Seenivasan, 2011; Khan & Dhar, 2007). 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, 2007a, b).

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, b; 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 post-decisional 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 et al., 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 et al., 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 post-decisional 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, Desai, and Seenivasan (2011). In two of the papers (Ramanathan & Williams, 2007; Giner-Sorolla, 2001) 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 versus utilitarian, and whether they do versus 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%, $\beta = .06$, $p = .859$).[6]

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.

[6] 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.

utilitarian) on self-control attributions was only significant when the choice represented a long-term goal violation and the consumption amount was high (β = .80, p = .038), but neither when the amount consumed was small (β = .03, p = .925), nor when the choice did not represent a long-term goal violation, irrespective of whether the amount consumed was large (β = .72, p = .124) or small (β = .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 tradeoffs 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, Fishbach, & Trope, 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; Toure-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; Toure-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 ($z = .10$, $p = .92$). 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 (Rozin et al., 1996; Oakes, 2005; Raghunathan et al., 2006), the correlation is weak and attitudes toward food and food associations are not universally shared (cf., Cornil & Chandon, 2015). 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 et al., 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 (Andre, Chandon, & Haws, 2017). 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 et al., 1999). Even within American consumers, major gender differences exist with respect to these associations (Rozin et al., 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 versus 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 et al., 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 (Kivetz & Simonson, 2002b; Haws & Poynor, 2008). 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 pre-commitment 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 versus 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, Cryder, & Loewenstein, 2006). 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 versus leisure tradeoff 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 pre-test. 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. Both the pretest and the experiment were pre-registered.

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% [36/40]) 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% [37/40] 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% [33/40] 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), the pen was worth ₩1,100 (approximately US$1). The cinema movie voucher was valid only on one particular day and was non-transferable. For participants in the self-control conflict present condition, it was valid on Saturday Oct. 13th, for participants in the control condition, it was valid on Saturday Oct. 20th, 2018. Because exams for all undergraduate programs at the university were scheduled in the week from Monday Oct 15th to Friday Oct 19th, 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 exams. No self-control conflict should be present when cinema vouchers were valid on the Saturday after exam 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 exam week, which would be indicative of participants having experienced a self-control conflict. The choice of the cinema voucher that was valid before exam 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 exam week, our framework predicts that at least as many participants as in the self-control conflict condition would chose it (we formulated this last prediction only after having pre-registered the experiment and hypotheses).

Participants and Procedure

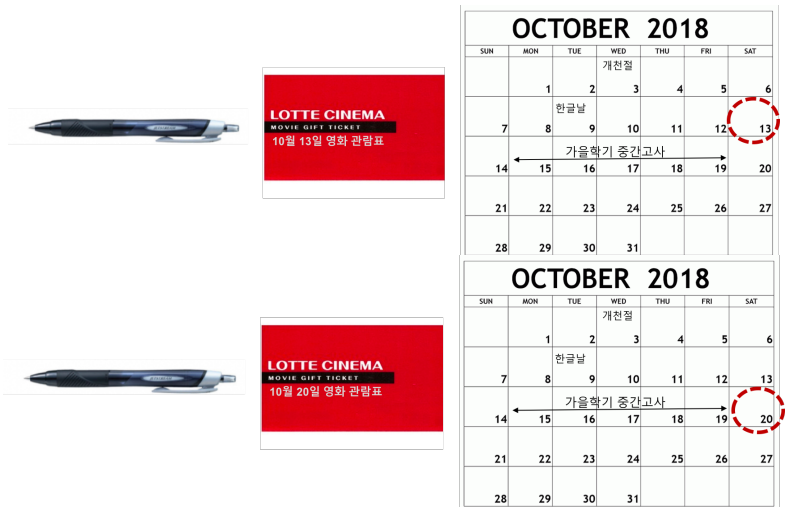
We employed a 2 (self-control conflict: yes vs. no) between-subjects design. Our aim was to recruit as many students as possible, with a minimum sample size of 100. One

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 exam 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 pre-registered.

Participants were informed that they would participate in a brief (5-minute) 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 5) 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 exam week and public holidays were marked.

Figure 5: Stimuli used in the experiment



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*.[7] 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 exam week ($M_{\text{self-control conflict}} = 4.57$, $SD = 1.77$) than when vouchers were valid after exam 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

[7] 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.

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 pre-test 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 17% of the pretest sample studying versus 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., Kivetz & Zheng, 2006; Hare et al., 2009). 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 et al., 2005).

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 violate their superordinate long-term goals. An experimenter may establish in a pre-test 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 pre-test 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 et al., 1996). It has been conceptualized as an interpersonal phenomenon (Baumeister, Stillwell, & Heatherton, 1994), often experienced in case of interpersonal harm (Zeelenberg and Breugelmans, 2008). Regret, on the other hand, is experienced in cases of both inter- and intrapersonal harm (Berndsen et al., 2004; Wagner et al., 2012). Since self-control conflicts are intra-personal 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, Stillwell, & Heatherton, 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 et al., 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 et al., 1998; Gailliot et al., 2007; Baumeister et al., 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 et al., 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 denote a preference for smaller but sooner rewards. Self-control, in contrast, involves a tradeoff 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 (Scholer & Higgins, 2010; McGuire & Kable, 2013; Watts et al., 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 non-replicability 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., 2005), 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 et al., 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 non-binding 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 that however such ego-depletion effects could not be replicated in highly-powered many lab replication attempts (Hagger & Chatzisarantis, 2016; cf., also Carter et al., 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 towards 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, 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, pre-commitment, 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, 2016; Young & Nestle, 2002; 2012). Rozin, Kabnick, Pete, Fischler, and Shields (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, Fishbach, & Trope, 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, etc. 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 and 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 (2015) 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).

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WEB APPENDIX

EXPERIMENT 1

To test whether consumers perceive the choice of a hedonic food over a utilitarian food as a self-control failure, we conducted a scenario-based experiment with two conditions (hedonic choice vs. utilitarian choice). For all experiments, we preregistered sample size, hypotheses, and analyses. All datasets, stimuli, and anonymized preregistrations can be accessed here: https://osf.io/ynwrv.

Participants and Procedure

Four hundred and thirteen Amazon Mechanical Turk (AMT) workers[8] (M_{age} = 36.12, *SD* = 11.89; 52.2% male) accessed our online study and read the following scenario: *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.* Participants were then randomly assigned to two conditions. They either read that Mr. A had chosen the chocolate cake (hedonic-choice condition) or that he had chosen the fruit salad (utilitarian-choice condition). Participants were then asked whether they thought Mr. A would see his choice as a self-control failure (three response options: *yes*, *no*, and *I am not sure*). We predicted that the *majority of participants* would perceive Mr. A's choice of the chocolate cake not as a self-control failure. Because consumers overall perceive chocolate to be unhealthier than fruit salad, we also predicted that a greater proportion of participants would indicate Mr. A to perceive the choice of the chocolate cake than of the fruit salad as a self-control failure.

Results and Discussion

[8] In experiments 1 to 3 we restricted participation to American workers with an approval rating of at least 95% and a past HIT approval rate of at least 500 (cf., Peer, Vosgerau, and Acquisti 2013).

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. Of these, a greater proportion was in the hedonic-choice (17.6%) than in the utilitarian-choice condition (9.9%, $z = 2.38$, $p = .02$). One might argue that participants in our experiment may have been reluctant to ascribe a self-control failure to an unknown person (Mr. A). To address this potential alternative explanation, we ran a replication of Experiment 1 in the first person.[9] Participants (N = 405 AMT) were asked to imagine that they had chosen the chocolate cake or the fruit salad. Replicating the results of Experiment 1, the majority of participants in both conditions indicated that they would see neither choice as a self-control failure (vice-choice: 59.3% vs. virtue-choice: 80.1%; both proportions are significantly greater than 50%, $z = 2.66$, $p = .008$, and $z = 8.55$, $p < .001$, respectively).

The results of both experiments show that consumers (or at least participants in our studies) seem to disagree with the conceptualization of self-control failures as the consumption of hedonic foods. Participants were—in line with the idea that engaging in hedonic consumption is to be considered a self-control failure—more likely to perceive the choice of the chocolate cake than the fruit salad as a self-control failure. However, this relative difference is dwarfed by the fact that 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 test whether their original conceptualization captures better consumers' perceptions of self-control conflicts and failures.

[9] We are grateful to Keith Wilcox who suggested this alternative explanation and agreed to engage in an adversarial collaboration by a) preregistering the first-person replication with our competing predictions, and b) betting a bottle of wine on whose prediction would turn out to be supported.

EXPERIMENT 2

In Experiment 2, we examine self-control attributions by manipulating whether choices are hedonic versus utilitarian, and whether they do versus do not violate a 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 vice food should more likely be seen as a self-control failure than the choice of a utilitarian virtue food. According to the latter, the choice of a food should more likely be seen as a self-control failure if it is inconsistent with the consumer's long-term goal and the consumer anticipates regretting her/his choice.

Experiment 2 is a modified version of Experiment 1 in which—besides Mr. A's choice of dessert—we orthogonally manipulated whether the choice constituted a violation of Mr. A's long-term goals and as such triggered regret or not. Experiment 2 employed a 2 (choice: hedonic vs. utilitarian) x 2 (long-term goal violation: yes vs. no) between-subjects design.

Participants and Procedure

Eight hundred and six AMT workers (M_{age} = 34.63, *SD* = 11.60; 54.4% male) accessed the study and were asked to imagine Mr. A choosing a dessert, like in Experiment 1. Participants were then randomly assigned to one of the four experimental conditions:

5. 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.*

6. 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.*
7. 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.*
8. 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.*

Like in Experiment 1, participants then indicated whether they thought Mr. A would see his choice as self-control failure.

Results and Discussion

Eight hundred and five participants completed the study and provided an answer on the dependent variable[10]. We ran a logistic regression to test whether participants' self-control failure attributions to Mr. A (yes vs. no) were influenced by Mr. A's dessert choice and by the violation of his long-term goals; estimates are displayed in Table 1; response proportions are displayed in Figure 1.

Table 1: Results of logistic regressions of self-control failure attributions (1 = yes, 0 = no), Experiment 2.

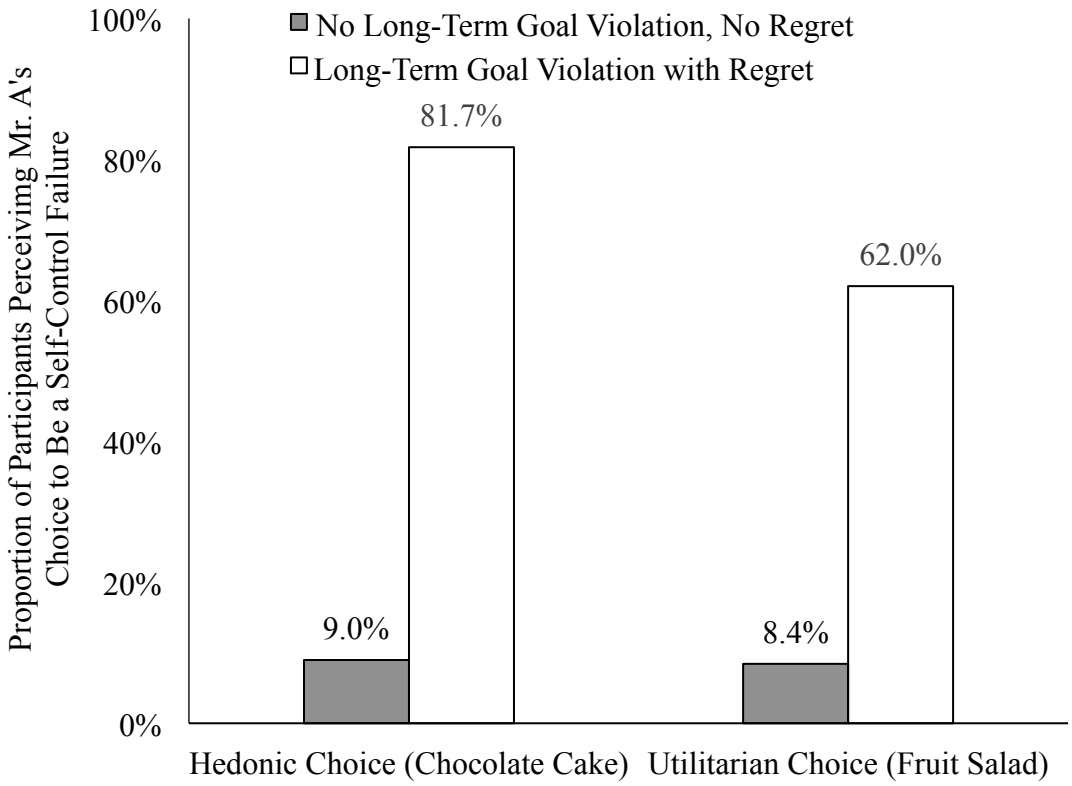
	B	Odds Ratio	*Wald*	*p*

[10] We first looked at differences across conditions in the proportion of participants responding "I am not sure". Even though proportions differed across conditions (hedonic choice, no goal conflict: 4.0%; hedonic choice, goal conflict: 6.9%, utilitarian choice, no goal conflict: 4.5%, utilitarian choice, goal conflict: 13.0%; $\chi^2(3) = 15.71$, $p < .001$), these differences were minor compared to differences in yes versus no responses. Note that we considered these participants when computing and reporting the shares corresponding to Yes and No.

Intercept	-.433	.648	14.77	< .001
Dessert Choice *1 = Hedonic; -1 = Utilitarian*	.281	1.325	6.22	.013
Long-Term Goal Violation *1 = Yes; -1 = No*	1.873	6.505	275.87	< .001
Interaction	.250	1.284	4.91	.027

The results clearly support the conceptualization of self-control failures as long-term goal violations. Participants' self-control failure attributions to Mr. A (yes vs. no) were significantly higher when his choice violated his superordinate long-term goal than when it did not ($\beta = 1.87$, $p < .001$). Analyzing the simple effects revealed that this effect was significant irrespective of whether the choice was hedonic (81.7% vs. 9.0%, $\beta = 4.25$, $p < .001$) or utilitarian (62.0% vs. 8.4%, $\beta = 3.25$, $p < .001$). They were also higher when Mr. A's choice was hedonic than utilitarian ($\beta = .28$, $p = .013$), but the significant interaction ($\beta = .25$, $p = .027$) and an analysis of the simple effects revealed that the hedonic choice was perceived as more of 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%, $\beta = .06$, $p = .859$).

Figure 1: Proportion of participants in Experiment 2 who indicated that Mr. A would see his choice as a self-control failure.



EXPERIMENT 3

In Experiment 2, we assumed that long-term goal violations would involve the anticipation of regret, confounding the two variables. To address this problem, in Experiment 3 we replicated the same design but asked participants to attribute not only self-control failures, but also the anticipation of regret to Mr. A. In addition, we manipulated the amount consumed. Consumers have been shown to exert self-control by rationing consumption quantities, for example by buying smaller packages (e.g., cigarettes) at a per-unit-price premium (Wertenbroch 1998; Schwartz et al. 2014; see also Dobson and Gerstner 2010). Hence, the more a consumer eats of a food which consumption violates her/his long-term goals, the more s/he should anticipate regretting that consumption, and the more likely s/he should be to view that food consumption as a self-control failure. Therefore, we predicted

that consumption amount would affect both the experience of self-control failures and the anticipation of regret. Specifically, we predicted that:

1. The choice of a food is more likely to be seen as inducing anticipated regret and as representing a self-control failure if it is inconsistent with the decision-maker's long-term goals.
2. The amount consumed moderates the effect of goal inconsistency such that goal-inconsistent food options are more likely to be seen as inducing anticipated regret and as representing self-control failures when the amount consumed is large than small.

Experiment 3 employed a 2 (choice: vice vs. virtue) x 2 (long-term goal violation: yes vs. no) x 2 (consumption amount: half a serving vs. two servings) between-subjects design.

Participants and Procedure

Eight hundred and nineteen AMT workers (M_{age} = 36.52, *SD* = 12.05; 46.0% male) accessed and completed Experiment 3. Participants read the same scenarios as in Experiment 2. Half of the participants were told that Mr. A chose half a serving of the dessert, whereas the other half was told that he chose two servings of the dessert. Before indicating whether they thought Mr. A would see his choice of dessert as a self-control failure, we asked participants to what extent they thought Mr. A would regret his choice (1 = not at all, 7 = very much).

Results

Self-Control Failure Attributions. We ran a logistic regression of whether participants thought Mr. A would see his choice as a self-control failure (yes or no[11]) on Mr. A's dessert

[11] As in Experiment 2, we first analyzed differences across conditions in the proportion of participants responding "I am not sure." Proportions differed marginally across the 8 experimental conditions, χ^2 (7) = 12.58,

choice, violation of his long-term goals, and consumption amounts; estimates are reported in Table 2; response proportions are displayed in Figure 2.

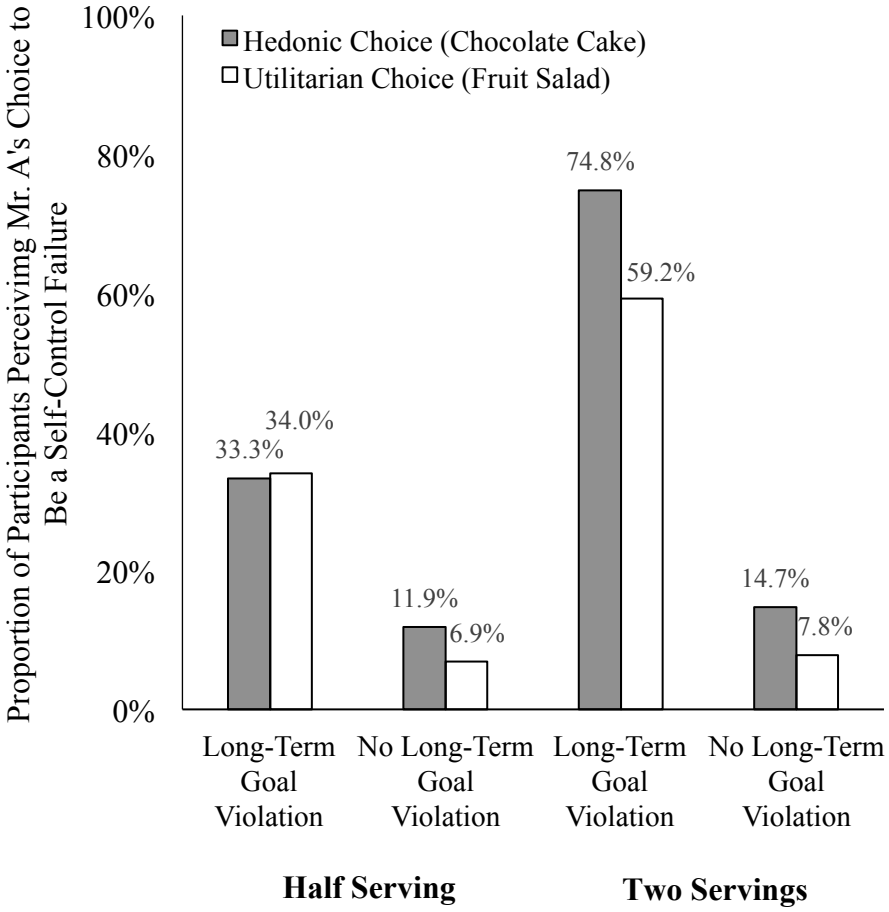
Table 2: Results of logistic regressions of self-control failure attributions (1 = yes, 0 = no), Experiment 3.

	B	Odds Ratio	*Wald*	*p*
Intercept	-.81	.45	58.55	< .001
Dessert Choice *1 = Hedonic; -1 = Utilitarian*	.27	1.31	6.39	.011
Long-Term Goal Violation *1 = Yes; -1 = No*	1.30	3.66	150.76	< .001
Consumption Amount *1 = Two Servings; -1 = Half Serving*	.51	1.67	22.96	< .001
Dessert Choice x Goal Violation	-.06	.94	.31	.578
Dessert Choice x Consumption Amount	.11	1.12	1.15	.284
Goal Violation x Consumption Amount	.38	1.47	13.15	< .001
Three-Way Interaction	.08	1.08	.58	.446

An analysis of the simple effects revealed that the effect of choice (hedonic vs. utilitarian) on self-control attributions was only significant when the choice represented a goal violation than when it did not and the consumption amount was high (74.8% vs. 59.2%, β = .80, p = .038), but neither when the consumption amount was small (33.3% vs. 34.0%, β = .03, p = .925), nor when the choice did not represent a goal violation, irrespective of whether the amount consumed was large (14.7% vs. 7.8%, β = .72, p = .124) or small (11.9% vs. 6.9%, β = .59, p = .241).

p = .083, ranging from 5.9% in the vice-choice, no goal conflict, half serving condition, to 18.4% in the virtue-choice, goal conflict, two servings condition.

Figure 2: Proportion of participants in Experiment 3 who indicated that Mr. A would see his choice as a self-control failure.



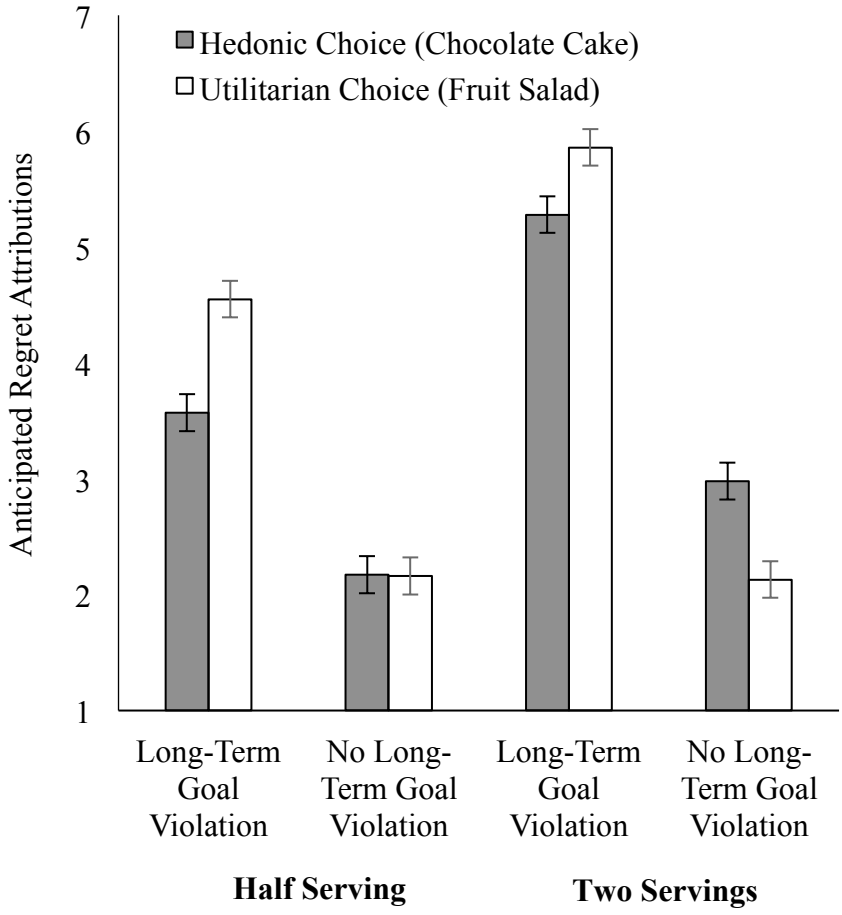
Anticipated Regret Attributions. Parallel to the analysis of the attribution of self-control failures, we ran an ANOVA of the extent to which participants believed Mr. A would regret his dessert choice on Mr. A's dessert choice, long-term goal violation, and consumption amount; estimates are displayed in Table 3, means are displayed in Figure 3.

Table 3: ANOVA results for the extent to which participants thought Mr. A would regret his choice in Experiment 3.

	F (1, 811)	p	*partial* η^2
Mr. A's Dessert Choice (1 = Hedonic, 0 = Utilitarian)	2.44	.12	.003
Long-Term Goal Violation (1 = Yes, 0 = No)	480.30	< .001	.372

Consumption Amount (1 = Two Servings, 0 = Half Serving)	71.88	< .001	.081
Dessert Choice x Goal Violation	29.39	< .001	.035
Dessert Choice x Consumption Amount	7.70	.006	.009
Goal Violation x Consumption Amount	24.69	< .001	.030
Three-Way Interaction	0.96	.33	.001

Figure 3: Participants' regret attributions to Mr. A for his dessert choice in Experiment 3 (error bars represent +/- std. error).



As predicted and consistent with the results regarding self-control failure attributions, participants thought Mr. A would be more likely to regret his choice when it constituted a violation of his long-term goals, $M_{\text{goal violation}} = 4.82$, $SD = 1.69$ vs. $M_{\text{no goal violation}} = 2.36$, $SD = 1.77$, $F(1, 811) = 480.30$, $p < .001$, irrespective of Mr. A's actual choice of dessert, $F(1, 811)$

= 2.44, p = .12. This effect was—again as predicted, and mirroring the results on self-control attributions—moderated by consumption amounts. Compared to goal-consistent choices for which differences in serving sizes mattered little ($M_{\text{two servings}}$ = 2.55, SD = 1.85 vs. $M_{\text{half serving}}$ = 2.16, SD = 1.66, $t(815) = 2.39$, p = .017), two servings of a goal-inconsistent choice were believed more likely to be regretted than half a serving of a goal-inconsistent choice ($M_{\text{two servings}}$ = 5.57, SD = 1.44 vs. $M_{\text{half serving}}$ = 4.06, SD = 1.59, $t(815) = 9.32$, $p < .001$).

We also observed two non-predicted significant interactions. The dessert choice x consumption amount interaction indicated that the difference in regret between half and two servings was smaller for fruit-salad than for chocolate cake choices. And the dessert choice x goal violation interaction suggests that for goal-consistent choices, the choice of chocolate cake was regretted more than the choice of fruit salad, whereas for goal-inconsistent choices, the choice of the fruit salad was regretted more than the choice of the chocolate cake.

Discussion

In Experiment 3, like in Experiment 2, the choice of a dessert—hedonic or utilitarian—had no effect on whether participants perceived the choice to be a self-control failure. Instead, what mattered was whether Mr. A's dessert choice constituted a violation of his long-term goals, and how much dessert Mr. A chose to consume. Analogous results were obtained on regret attributions. Participants believed Mr. A would regret his dessert choice when it constituted a violation of his long-term goals, and regret was intensified the larger was the amount Mr. A chose to consume. These findings suggest that consumers represent self-control failures in line with a 'long-term goal violation leading to regret' conceptualization. The more severely a choice violates one's long-term goals, the more it is expected to be regretted and seen as a self-control failure. Whether choice options are hedonic or utilitarian, in contrast, has little bearing for the experience of self-control failures.

The effects for self-control failures mirrored those observed for anticipated regret, except for one additional significant interaction. When Mr. A's dessert choice violated his long-term goals, participants thought Mr. A would regret consuming the fruit salad more than consuming the chocolate cake. For the attribution of self-control failures, if anything, the opposite pattern was observed: When Mr. A's dessert choice violated his long-term goals, participants perceived consumption of the chocolate cake more as a self-control failure than consumption of the fruit salad (thought this interaction was not significant). Our best post-hoc explanation for this discrepancy is that anticipated regret is affected by the immediacy with which the negative consequences of a self-control failure are experienced. Eating a lot of chocolate does not lead to immediate negative consequences, but eating a lot of fruit salad does so when one suffers from chronic heartburn. Hence, consumption of the fruit salad leads to more anticipated regret than the consumption of chocolate cake. The latter, however, may more likely be seen as a self-control failure because consumers believe the consumption of chocolate in general to be less healthy than the consumption of fruit salad.

Table 1. Review of papers on self-control in food consumption in twelve consumer behavior, psychology, and management journals from 1998 to 2018: *Management Science, Journal of Marketing Research, Marketing Science, Journal of Marketing, Journal of Consumer Research*, *Journal of Consumer Psychology, Marketing Letters*, *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*.

For each study that examines self-control in food consumption we recorded whether real food items were used as stimuli, whether consumption was observed within the study (including studies that retrospectively ask participants to report their consumption frequency of certain foods), 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 (where only examples were listed, those are reported), 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 (e.g., using goal priming procedures), or whether only participants sharing the same goal hierarchy were recruited to participate. Both in the latter case and in the case in which goal hierarchy was manipulated, we considered both studies in which the measurement was direct (e.g., assessment of the importance of the goal of losing weight or eating healthy) and indirect (e.g., gender justified as a proxy by evidence that female participants are more likely to have the goal of eating healthy or restraining their food intake).

Study N	*Article N*	*Journal*	*Authors (Year)*	*Real Food*	*Actual Consumption*	*Study*	*Operationalization of Self-Control*	*Stimuli Representing Self-Control = Utilitarian Foods*	*Stimuli Representing Self-Control Failure = Hedonic Foods*	*Untested Assumption on Participants' Goal Hierarchy*	*Measurement of Participants' Goal Hierarchy*	*Manipulation of Participants' Goal Hierarchy*	*Recruitment of Participants with the Same Goal Hierarchy*
1	1	JCR	Chandon and Wansink (2007)	No	No	3	Calories	Small, medium, or large diet fountain drink containing no calories	Small, medium, or large regular soda (containing 155, 205, and 310 calories, respectively); Chocolate chip cookies (containing 220 calories per cookie)	Yes	No	No	No
2				No	No	4	Intention to order (1 = I wouldn't want any chips; 9 = I would want some chips)		Potato chips (as a side dish)	Yes	No	No	No

Study N	*Article N*	*Journal*	*Authors (Year)*	*Real Food*	*Actual Consumption*	*Study*	*Operationalization of Self-Control*	*Stimuli Representing Self-Control = Utilitarian Foods*	*Stimuli Representing Self-Control Failure = Hedonic Foods*	*Untested Assumption on Participants' Goal Hierarchy*	*Measurement of Participants' Goal Hierarchy*	*Manipulation of Participants' Goal Hierarchy*	*Recruitment of Participants with the Same Goal Hierarchy*
3	2	JCR	Coelho do Vale, Pieters, and Zeelenberg (2008)	Yes	Yes	2	Amount consumed		Potato chips	No	No	Yes	No
4				Yes	Yes	2	Amount consumed		M&Ms	Yes	No	No	No
5	3	JCR	Dewitte, Bruyneel, and Geyskens (2009)	No	No	4	Number of times (0-2) Ps chose the indulgent option in two hypothetical scenarios	Fruit salad, Rice	Ice cream with chantilly cream, Fries	Yes	No	No	No
6	4	JCR	Duke and Amir (2018)	Yes	Yes	3	Choice; Amount consumed	Shelled edamame	Caramel-covered popcorn	Yes	No	No	No
7				No	No	1A	Amount of fat in chosen menu items	N/A		Yes	No	No	No
8				Yes	Yes	2A	Self-reported monthly frequency		Eating at a fast-food	Yes	No	No	No
9	5	JCR	Dzhogleva and Lamberton (2014)	No	No	*4A*	Choice (1 = strongly prefer the $50 restaurant gift certificate; 7 = strongly prefer the $50 groceries gift certificate)	$50 grocery gift card	$50 restaurant gift card	Yes	No	No	No
10				No	No	4B	Choice (1 = very unhealthy but very tasty restaurant; 7 = very healthy but not so tasty restaurant)	$25 gift card to a very healthy but not so tasty restaurant	$25 gift card to a very unhealthy but very tasty restaurant	Yes	No	No	No

Study N	*Article N*	*Journal*	*Authors (Year)*	*Real Food*	*Actual Consumption*	*Study*	*Operationalization of Self-Control*	*Stimuli Representing Self-Control = Utilitarian Foods*	*Stimuli Representing Self-Control Failure = Hedonic Foods*	*Untested Assumption on Participants' Goal Hierarchy*	*Measurement of Participants' Goal Hierarchy*	*Manipulation of Participants' Goal Hierarchy*	*Recruitment of Participants with the Same Goal Hierarchy*
11				Yes	Yes	1	Choice, Amount of M&Ms consumed (only for Ps who chose M&Ms)	Grapes	M&Ms	Yes	No	No	No
12	6	JCR	Fedorikhin and Patrick (2010)	Yes	Yes	2	Choice, Amount of M&Ms consumed (only for Ps who chose M&Ms)	Grapes	M&Ms	Yes	No	No	No
13				Yes	Yes	3	Choice, Amount of M&Ms consumed (only for Ps who chose M&Ms)	Grapes	M&Ms	Yes	No	No	No
14	7	JCR	Ferraro, Shiv, and Bettman (2005)	Yes	No	1	Choice	Fruit salad	Chocolate cake	No	No	No	Yes
15				Yes	No	2	Choice	Fruit salad	Chocolate cake	No	No	No	Yes
16	8	JCR	Finkelstein and Fishbach (2010)	Yes	Yes	2	Amount consumed	Pretzels (neither a vice nor a virtue)		No	Yes	No	No
17	9	JCR	Fishbach and Dhar (2005)	Yes	No	1	Choice	Apple	Chocolate bar	No	No	No	Yes
18				No	No	4	Extent to which Ps would like to have a heavy (i.e., tasty but fatty) food for dinner on that night (5-pt scale)		Tasty but fatty food	No	No	No	Yes
19	10	JCR	Gal and Liu (2011)	Yes	No	1	Choice	Apple	Chocolate bar	Yes	No	No	No
20				Yes	No	3	Choice	Apple	Chocolate bar	Yes	No	No	No
21				Yes	No	4	Choice	Apple	Chocolate bar	No	Yes	No	Yes
22	11	JCR	Geyskens, Dewitte, Pandelaere, and Warlop (2008)	Yes	Yes	3A	Amount consumed		M&Ms	Yes	No	No	No
23				Yes	Yes	3B	Amount consumed		M&Ms	Yes	No	No	No
24	12	JCR	Hong and Lee	Yes	No	2	Choice	Apple	Chocolate bar	Yes	No	No	No

Study N	*Article N*	*Journal*	*Authors (Year)*	*Real Food*	*Actual Consumption*	*Study*	*Operationalization of Self-Control*	*Stimuli Representing Self-Control = Utilitarian Foods*	*Stimuli Representing Self-Control Failure = Hedonic Foods*	*Untested Assumption on Participants' Goal Hierarchy*	*Measurement of Participants' Goal Hierarchy*	*Manipulation of Participants' Goal Hierarchy*	*Recruitment of Participants with the Same Goal Hierarchy*
25			(2008)	Yes	No	3	Choice	Apple	Chocolate bar	Yes	No	No	No
26	13	JCR	Huang, Huang, and Wyer (2016)	No	No	4	Choice	Salad	French fries	Yes	No	No	No
27				No	No	5	Choice	Apple	Chocolate bar	Yes	No	No	No
28	14	JCR	Hung and Labroo (2011)	Yes	No	4	Percentage of healthy food items purchased	Fresh fruit, Green tea, Yogurt	Ice-Cream, Butter croissant, Candy, Chocolate	No	Yes	No	No
29				Yes	No	5	Choice	Apple	Chocolate bar	Yes	No	No	No
30	15	JCR	Hur, Koo, and Hofmann (2015)	Yes	Yes	6	Amount eaten (rated by two independent coders)		Cookie	No	No	No	Yes
31	16	JCR	Kim (2013)	Yes	Yes	1	Amount consumed		M&Ms	Yes	No	No	No
32	17	JCR	Kim, Wadhwa, and Chattopadhyay (2018)	Yes	No	1	Fat calorie intake	Healthy items (e.g., veggie wrap, salad)	Unhealthy items (e.g., double cheeseburger, pepperoni pizza)	Yes	No	No	No
33				No	No	2A	Likelihood of ordering	Subway turkey breast sandwich	Carl's Jr. X-tra bacon double-double	Yes	No	No	No
34				Yes	No	2B	Number of cookies taken home	Healthy oatmeal cookie	Delicious sugar cookie	Yes	No	No	No
35				Yes	No	5	Choice	Apple	Chocolate brownie	Yes	No	No	No
36	18	JCR	Klesse, Levav, and Goukens (2015)	Yes	Yes	1A	Choice	Healthy fruit skewer	Indulgent chocolate skewer	Yes	No	No	No
37				Yes	No	1B	Caloric content of the chosen snack	Bagged apple slices, Baby carrot bag, Wasa sandwich snack, Cereal bar, Cereal cookies, Fruit biscuits	Snickers, Mars, Kinder Bueno, KitKat Chunky, Potato chips, M&Ms	Yes	No	No	No
38				Yes	No	2	Choice	Banana	Twix candy bar	Yes	No	No	No

Study N	*Article N*	*Journal*	*Authors (Year)*	*Real Food*	*Actual Consumption*	*Study*	*Operationalization of Self-Control*	*Stimuli Representing Self-Control = Utilitarian Foods*	*Stimuli Representing Self-Control Failure = Hedonic Foods*	*Untested Assumption on Participants' Goal Hierarchy*	*Measurement of Participants' Goal Hierarchy*	*Manipulation of Participants' Goal Hierarchy*	*Recruitment of Participants with the Same Goal Hierarchy*
39				Yes	No	3	Caloric content of the chosen snack	Bagged apple slices, Baby carrot bag, Wasa sandwich snack, Cereal bar, Cereal cookies, Fruit biscuits	Snickers, Mars, Twix, KitKat, M&Ms, Potato chips	Yes	No	No	No
40				Yes	No	4	Caloric content of the chosen snack	Bagged apple slices, Baby carrot bag, Wasa sandwich snack, Cereal bar, Cereal cookies, Fruit biscuits	Snickers, Mars, Twix, KitKat, M&Ms, Potato chips	Yes	No	No	No
41				No	No	1	Number (out of 5 different ones) of small desserts chosen by participants		Desserts	No	Yes	No	No
42	19	JCR	Krishnamurthy and Prokopec (2010)	No	No	2	Number (out of 5 different ones) of small desserts chosen by participants		Desserts	No	Yes	No	No
43				Yes	No	3	Number of fun-sized candy bars taken		Assorted fun-sized candy bars	No	No	Yes	No
44				Yes	No	4	Number of fun-sized candy bars taken		Assorted fun-sized candy bars	Yes	No	No	No
45	20	JCR	Laran (2010a)	No	No	1	Choice	Healthy snacks (raisins, celery sticks, cheerios, low fat yogurt, baby carrots, granola bar, rice cake, and apple)	Tasty but fatty snacks (chocolate bar, Chips Ahoy cookies, cheese curls, Doritos chips, ice cream, doughnuts, Oreos, and fruit roll-ups)	No	No	Yes	No

Study N	*Article N*	*Journal*	*Authors (Year)*	*Real Food*	*Actual Consumption*	*Study*	*Operationalization of Self-Control*	*Stimuli Representing Self-Control = Utilitarian Foods*	*Stimuli Representing Self-Control Failure = Hedonic Foods*	*Untested Assumption on Participants' Goal Hierarchy*	*Measurement of Participants' Goal Hierarchy*	*Manipulation of Participants' Goal Hierarchy*	*Recruitment of Participants with the Same Goal Hierarchy*
46				No	No	2	Choice	Healthy snacks	Fatty snacks	No	No	Yes	No
47				No	No	4	Choice	Healthy snacks	Fatty snacks	Yes	No	Yes	No
48				No	No	1	Multiple choices (number of tasty snacks chosen out of 4; Ps were able to choose from a list of 8 healthy and 8 fatty snacks)	Healthy snacks (raisins, celery sticks, cheerios, low fat yogurt, baby carrots, granola bar, rice cake, and apple)	Tasty snacks (chocolate bar, Chips Ahoy cookies, cheese curls, Doritos chips, ice cream, doughnuts, Oreos, and fruit roll-ups)	Yes	No	No	No
49				No	No	2	Choice	"Low fat, healthy food item"	"Rich, tastier food item"	Yes	No	No	No
50	21	JCR	Laran (2010b)	No	No	3	Multiple choices (number of tasty snacks chosen out of 3; Ps were able to choose from a list of 8 healthy and 8 fatty snacks)	Healthy snacks (raisins, celery sticks, cheerios, low fat yogurt, baby carrots, granola bar, rice cake, and apple)	Tasty snacks (chocolate bar, Chips Ahoy cookies, cheese curls, Doritos chips, ice cream, doughnuts, Oreos, and fruit roll-ups)	No	No	Yes	No
51				No	No	4A	Multiple choices (number of tasty snacks chosen out of 4; Ps were able to choose from a list of 8 healthy and 8 fatty snacks)	Healthy snacks (raisins, celery sticks, cheerios, low fat yogurt, baby carrots, granola bar, rice cake, and apple)	Tasty snacks (chocolate bar, Chips Ahoy cookies, cheese curls, Doritos chips, ice cream, doughnuts, Oreos, and fruit roll-ups)	Yes	No	No	No
52				Yes	No	5	Rating (1 = very healthy to 10 = very indulgent) of items purchased	Healthy snacks	Indulgent snacks	Yes	No	No	No
53	22	JCR	Laran and	Yes	Yes	1A	Amount consumed		M&Ms and Skittles	Yes	No	No	No

Study N	*Article N*	*Journal*	*Authors (Year)*	*Real Food*	*Actual Consumption*	*Study*	*Operationalization of Self-Control*	*Stimuli Representing Self-Control = Utilitarian Foods*	*Stimuli Representing Self-Control Failure = Hedonic Foods*	*Untested Assumption on Participants' Goal Hierarchy*	*Measurement of Participants' Goal Hierarchy*	*Manipulation of Participants' Goal Hierarchy*	*Recruitment of Participants with the Same Goal Hierarchy*
54			Janiszewski (2011)	Yes	Yes	2	Amount consumed		M&Ms and Skittles	Yes	No	No	No
55	23	JCR	Lisjak, Bonezzi, Kim, and Rucker (2015)	Yes	Yes	1	Amount consumed		M&Ms	No	Yes	No	No
56	24	JCR	Lowe and Haws (2014)	Yes	Yes	3	Amount consumed		Individually wrapped miniature chocolate candies	Yes	No	No	No
57				No	No	1A	Choice	Healthy fruit bowl	Decadent piece of chocolate	Yes	No	No	No
58				Yes		1C	Choice	Healthy granola bar	Decadent piece of chocolate	Yes	No	No	No
59	25	JCR	May and Irmak (2018)	Yes		3	Choice	Healthy granola bar	Decadent piece of chocolate	Yes	No	No	No
60				No		4	Choice	Healthy fruit bowl	Decadent piece of chocolate	Yes	No	No	No
61				No	No	5	Amount purchased (hypothetical)		Candies	Yes	No	No	No
62	26	JCR	Mehta, Zhu, and Meyers-Levy (2014)	Yes	Yes	1A	Amount consumed		M&Ms	Yes	No	No	No
63				Yes	Yes	2	Amount consumed		Cheeseballs	Yes	No	No	No
64	27	JCR	Mukhopadhyay, Sengupta, and Ramanathan (2008)	Yes	Yes	3	Amount consumed		Cookies	Yes	No	No	No
65				No	No	4	Choice	Fruit salad	Chocolate cake	Yes	No	No	No
66				Yes	Yes	1	Amount scooped and consumed		Vanilla ice cream	Yes	No	No	No
67	28	JCR	Nenkov and Scott (2014)	No	No	4	Choice (1 = will definitely have the rich entrée; 7 = will definitely have the healthy entrée)	Healthy, less tasty entrée	Rich and delicious entrée	Yes	No	No	No

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68	29	JCR	Ramanathan and Williams (2007)	No	(1) Yes (2) No	1	Choice to take cookies; Likelihood of choosing one of the items		Cookies (at time 1); 8 hedonic food items such as cheesecake and ice cream (at time 2)	Yes	No	No	No
69				Yes	(1) Yes (2) No	2	Choice to take cookies; Choice between chips and notepad	Notepad (at time 2)	Cookies (at time 1); Chips (at time 2)	Yes	No	No	No
70	30	JCR	Romero and Biswas (2016)	No	No	1A	Choice	Salads (chicken salad, grilled italian chicken ceasar salad, shrimp salad, taco salad)	Burgers or sandwiches (bacon cheeseburger, cowboy burger, chicken BLT, Four cheese grill)	Yes	No	No	No
71				No	No	1B	Choice	Broccoli salad	Grilled cheese sandwich	Yes	No	No	No
72				No	No	3	Choice	Strawberries	Chocolate cake	Yes	No	No	No
73				No	No	4	Choice	Raisins	Chocolate chip cookies	Yes	No	No	No
74				Yes	Yes	5	Amount consumed	Low-calorie orange juice with high vitamin content	High-calorie synthetic orange soda with no vitamin content	Yes	No	No	No
75	31	JCR	Rottenstreich, Sood, and Brenner (2007)	No	No	1	Choice	Fruit salad	Chocolate cake, Cheesecake, Creme Brulée	Yes	No	No	No
76	32	JCR	Salerno, Laran, and Janiszewski (2014)	Yes	Yes	1	Amount consumed		M&Ms	No	No	Yes	No
77				Yes	Yes	2	Amount consumed		Famous Amos Chocolate Chip Cookies	No	No	Yes	No
78				No	No	3	Choice	Raisins (Participation in raisin-eating study)	M&Ms (Participation in M&Ms-eating study)	No	No	Yes	No
79				No	No	4	Choice	Grocery store gift card	Trendy restaurant gift card	No	No	Yes	No
80	33	JCR	Salerno, Laran,	Yes	No	2	Choice	Granola bar	M&Ms	No	No	Yes	No

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81			and Janiszewski (2015)	Yes	No	3	Choice	Bag of baby carrots	Pack of Oreo	No	No	Yes	No
82				Yes	Yes	2	Amount and calories consumed		M&Ms	No	Yes	No	No
83	34	JCR	Scott, Nowlis, Mandel, and Morales (2008)	Yes	Yes	3	Amount and calories consumed		Cookies	No	Yes	No	No
84				Yes	Yes	4	Amount and calories consumed		M&Ms	No	Yes	No	No
85				No	No	1A	Choice	Reduced fat ice cream	Regular ice cream	Yes	No	No	No
86	35	JCR	Sela, Berger, and Liu (2009)	Yes	No	1B	Choice	Fruit (banana, red apple, pear, green apple, tangerine, and peach) - all 6 or only one of these	Cookies and cakes (chocolate chip, oatmeal raisin, white chocolate chip, and M&M cookies; mini croissants; and banana nut muffins) - all 6 or only one of these	Yes	No	No	No
87	36	JCR	Shiv and Fedorikhin (1999)	Yes	No	1	Choice	Fruit salad	Chocolate cake	Yes	No	No	No
88				Yes	No	2	Choice	Fruit salad	Chocolate cake	Yes	No	No	No
89				No	No	1	Choice	Salad subscription	Dessert subscription	Yes	No	No	No
90				Yes	Yes	2	Choice	Nutritional fruit granola bars	Decadent chocolate granola bars	Yes	No	No	No
91				No	No	3	Preference for the coupon	Coupon for wine (perceived as virtue)	Coupon for wine (perceived as vice)	No	Yes	No	No
92	37	JCR	Siddiqui, May, and Monga (2017)	No	No	4	Willingness to drive to get the gift certificate	Gift certificate for healthy but not tasty shake	Gift certificate for tasty but not healthy shake	Yes	No	No	No
93				No	No	5	Willingness to drive to get the gift certificate	Gift certificate for healthy but not tasty shake	Gift certificate for tasty but not healthy shake	Yes	No	No	No

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94				Yes	No	1	Average impulsiveness, weighted-average impulsiveness, average unhealthiness, and weighted-average unhealthiness of shopping basket	N/A	N/A	Yes	No	No	No
95	38	JCR	Thomas, Desai, and Seenivasan (2011)	No	No	2	Number of vice products in basket; Amount spent on vice vs. healthy purchases	10 healthy products: Aquafina Pure Water six-pack, Arnold/Brownberry 100% Whole Wheat Bread, Bush's Baked Bean, Cheerios Cereal Honey Nut, Del Monte Diced Peaches, Health Valley Granola, Kashi Go Lean Crunch Cereal, Quaker Oatmeal, Special K Cereal, Yoplait 99% Fat Free Yogurt	10 vice products: Chips Ahoy Chocolate Chip Cookies, Coca Cola Classic, Ghirardelli Hot Cocoa, Little Debbie Muffins Banana Nut, Mrs. Smith's Apple Pie, Mrs. Smith's Pumpkin Pie, Oreo Cookies Chocolate Sandwich, Oreo Cookies Golden Sandwich, Sara Lee Cheesecake, Drake's Coffee Cakes	Yes	No	No	No

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96				No	No	3	Number of vice products in basket; Amount spent on vice vs. healthy purchases	10 healthy products: Aquafina Pure Water six-pack, Arnold/Brownberry 100% Whole Wheat Bread, Bush's Baked Bean, Cheerios Cereal Honey Nut, Del Monte Diced Peaches, Health Valley Granola, Kashi Go Lean Crunch Cereal, Quaker Oatmeal, Special K Cereal, Yoplait 99% Fat Free Yogurt	10 vice products: Chips Ahoy Chocolate Chip Cookies, Coca Cola Classic, Ghirardelli Hot Cocoa, Little Debbie Muffins Banana Nut, Mrs. Smith's Apple Pie, Mrs. Smith's Pumpkin Pie, Oreo Cookies Chocolate Sandwich, Oreo Cookies Golden Sandwich, Sara Lee Cheesecake, Drake's Coffee Cakes	Yes	No	No	No
97				No	No	4	Number of vice products in basket; Amount spent on vice vs. healthy purchases	10 healthy products: Aquafina Pure Water six-pack, Arnold/Brownberry 100% Whole Wheat Bread, Bush's Baked Bean, Cheerios Cereal Honey Nut, Del Monte Diced Peaches, Health Valley Granola, Kashi Go Lean Crunch Cereal, Quaker Oatmeal, Special K Cereal, Yoplait 99% Fat Free Yogurt	10 vice products: Chips Ahoy Chocolate Chip Cookies, Coca Cola Classic, Ghirardelli Hot Cocoa, Little Debbie Muffins Banana Nut, Mrs. Smith's Apple Pie, Mrs. Smith's Pumpkin Pie, Oreo Cookies Chocolate Sandwich, Oreo Cookies Golden Sandwich, Sara Lee Cheesecake, Drake's Coffee Cakes	Yes	No	No	No

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98				Yes	No	2	Choice	Snack-sized box of Sun Maid Raisins	Single-cup Reese's Peanut Butter Cup	No	No	Yes	No
99				No	No	3	Choice	Participation in decision- making study (that did not involve eating cookies)	Participation in taste study that would involve eating Oreo cookies	No	No	Yes	No
	39	JCR	Townsend and Liu (2012)										
100				No	No	4	Choice	Participation in decision- making study (that did not involve eating cookies)	Participation in taste study that would involve eating Oreo cookies	No	No	Yes	No
101				Yes	No	5	Choice	Snack-sized box of Sun Maid Raisins	Single-cup Reese's Peanut Butter Cup	No	No	Yes	No
102				Yes	Yes	1	Amount consumed		Pringles potato chips	Yes	No	No	No
103	40	JCR	Vanbergen and Laran (2016)	Yes	No	2	Choice	Nature Valley granola bar	Pack of Oreo	Yes	No	No	No
104				Yes	Yes	3	Amount consumed		Pringles potato chips	Yes	No	No	No
105	41	JCR	Vohs and Faber (2007)	Yes	No	3	Amount spent on healthy vs. unhealthy purchases (out of $10 experiment money)	A granola bar, a bag of pretzels, a bagel, a bottle of orange juice	A candy bar, a bag of Doritos, a donut, a bottle of Coke	Yes	No	No	No
106				No	No	1	Likelihood of ordering	Mixed green salad	Beer battered fish & chips	Yes	No	No	No
107	42	JCR	Wang and Huang (2018)	Yes	No	2	Choice	Nature Valley granola bar	Twix candy bar	Yes	No	No	No
108				No	No	3	Likelihood of ordering	Mixed green salad	Beer battered fish & chips	Yes	No	No	No
109	43	JCR	Wilcox, Kramer, and Sen (2011)	No	No	3	Choice	Salad	French fries	No	No	Yes	No
110				No	No	4	Choice	Salad	French fries	No	Yes	No	No
111	44	JCR	Wilcox and	No	No	3	Choice	Granola bar	Chocolate chip cookie	Yes	No	No	No

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112			Stephen (2013)	Yes	Yes	5	Frequency of binge eating	N/A	N/A	Yes	No	No	No
113				No	No	1	Choice	Salad, baked potato, chicken nuggets	French fries	No	Yes	No	No
114				No	No	2A	Choice	Veggie burger, Chicken sandwich, or Fish sandwich	Bacon cheeseburger	No	Yes	No	No
115	45	JCR	Wilcox, Vallen, Block, and Fitzsimons (2009)	No	No	2B	Choice	100 Calorie Oreo cookies, Original Oreo cookies, Golden Oreo cookies	Chocolate covered Oreo cookies	No	Yes	No	No
116				No	No	3	Choice	Salad, baked potato, chicken nuggets	French fries	No	Yes	No	No
117				No	No	4	Choice	Salad, baked potato, chicken nuggets	French fries	No	Yes	No	No
118				Yes	Yes	1	Amount consumed	Raisins	M&Ms	Yes	No	No	No
119				No	No	2	Number of unhealthy snacks desired (up to 15) rated as unhealthy by a judge		Cookies, Potato chips, Candy bars (examples)	Yes	No	No	No
120	46	JCR	Winterich and Haws (2011)	No	No	3	Number of unhealthy snacks desired (up to 7) rated as unhealthy by a judge		Unhealthy snacks	No	Yes	No	No
121				No	No	4	Share of unhealthy snacks desired		Unhealthy snacks	No	Yes	No	No
122	47	JCR	Zhang, Huang, and Broniarczyk (2010)	Yes	Yes	3	Amount consumed		Soda	No	No	Yes	No

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123	48	JCP	Dholakia, Gopinath, Bagozzi, and Nataraajan (2006)	Yes	No	2	Self-control intention: I am resisting the urge to eat the cheese-cake (1 = strongly disagree; 7 = strongly agree)		Cheesecake	No	No	No	Yes
124	49	JCP	Ein-Gar and Steinhart (2011)	No	No	3	Likelihood to purchase hedonic items (0 = I would certainly not buy it; 100 = I would certainly buy it)		Hedonic grocery items (e.g., chips, soda, chewing gum)	Yes	No	No	No
125				Yes	Yes	4	Amount consumed		Salty puffs and chocolate snacks	Yes	No	No	No
126	50	JCP	Hedgcock, Vohs, and Rao (2012)	No	No	2	Choice between pairs of vice-virtue snacks or drinks (scale anchors: "I definitely would not select this snack/drink" and "I definitely would select this snack/ drink")	Snacks and drinks: Clif Bar, Powerbar, Propel Zero, and calorie free Vitamin Water	Snacks and drinks: Snickers, MilkyWay, Coca-Cola, and Pepsi	No	No	Yes	No
127	51	JCP	Hildebrand, Harding, and Hadi (2018)	No	No	1	(Craving) Salivation after the exposure to the stimulus		Chocolate	Yes	No	No	No
128				No	No	2	Craving	Taco salad, Arugula pizza	Burrito, Cheese pizza	Yes	No	No	No
129				No	No	3	Craving		Cheese pizza	Yes	No	No	No

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130	52	JCP	Kivetz and Zheng (2017)	No	No	3	Purchase intention	Chocolate as energy source for exercise	Chocolate as snack item for pleasure	No	No	Yes	No
131				No	No	4	Purchase intention		Chocolate	Yes	No	No	No
132				No	No	6	Choice	Fruit salad	Chocolate cake	Yes	No	No	No
133				No	No	2	Choice (1 = definitely prefer cake; 9 = definitely prefer fruit salad)	Fruit salad	Chocolate cake	Yes	No	No	No
134	53	JCP	Mukhopadhyay and Johar (2009)	No	No	3	Choice (1 = definitely prefer cake; 9 = definitely prefer fruit salad)	Fruit salad	Chocolate cake	Yes	No	No	No
135				No	No	4	Choice (1 = definitely prefer cake; 9 = definitely prefer fruit salad)	Fruit salad	Chocolate cake	Yes	No	No	No
136	54	JCP	Park and Hedgcock (2016)	Yes	Yes	3	Amount consumed		Candy	No	No	Yes	No
137	55	JCP	Patrick, Chun, and MacInnis (2009)	Yes	Yes	1	Amount consumed		Chocolate cake	Yes	No	No	No
138				Yes	Yes	2	Amount consumed		Chocolate cake	Yes	No	No	No
139	56	JCP	Trudel and Murray (2013)	Yes	Yes	1	Amount consumed		Chocolate	No	No	Yes	No
140				Yes	Yes	2	Amount consumed		Chocolate	No	No	Yes	No
141				Yes	Yes	3	Amount consumed		Chocolate	No	Yes	No	No
142	57	JCP	Walsh (2014)	Yes	Yes	2	Amount consumed		Chocolate cookies	No	No	Yes	No
143	58	JEP:G	Khan and Dhar (2007)	Yes	No	3	Choice	Plain fat-free yogurt	Large Mrs Field's cookie	No	No	No	Yes
144				Yes	No	4	Choice	Plain fat-free yogurt	Large Mrs Field's cookie	No	No	No	Yes
145	59	JEP:G	Kivetz and Zheng	Yes	No	1C	Choice	Fruit salad	Chocolate cake	No	Yes	No	No

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			(2006)										
146				Yes	No	3	Choice	Set of 4 AA or AAA Duracell Alkaline Batteries	Box of Godiva 4 Piece Assorted Deluxe Chocolates	Yes	No	No	No
147				Yes	No	4	Choice	Set of 4 AA or AAA Duracell Alkaline Batteries	Box of Godiva 4 Piece Assorted Deluxe Chocolates	Yes	No	No	No
148	60	JEP:G	Miles et al. (2016)	Yes	Yes	-	Amount consumed		Chocolate	Yes	No	No	No
149				Yes	Yes	4	Amount consumed		Pringles potato chips	Yes	No	No	No
150				Yes	Yes	5	Forced abstinence from consumption (manipulated between subjects)		Pringles potato chips	Yes	No	No	No
151				Yes	Yes	7	Amount consumed		Pringles potato chips	Yes	No	No	No
152	61	JEP:G	Tuk, Zhang, and Sweldens (2015)	No	No	8	Intention to eat healthy and unhealthy food	Tomatos, Grapes	Chips, Skittles	Yes	No	No	No
153				Yes	Yes	15	Amount consumed		Pringles potato chips	Yes	No	No	No
154				Yes	Yes	16	Amount consumed		Pringles potato chips	Yes	No	No	No
155				Yes	Yes	17	Amount consumed		M&Ms	Yes	No	No	No
156				No	No	18	Intention to eat unhealthy food		Soft drink, Candy bar, Hamburger	Yes	No	No	No
157	62	JESP	DeWall, Baumeister, Stillman, and Gailliot (2007)	Yes	Yes	1	Forced consumption of one of the two foods (manipulated between subjects)	Radishes	Donut	Yes	No	No	No
158	63	JESP	Fujita and Roberts (2010)	No	No	1	Choice	Apple, Banana	Piece of lemon pound cake, Chocolate candy bar	No	Yes	No	No
159	64	JESP	Hofmann, Friese,	Yes	Yes	-	Amount consumed		M&Ms	No	No	No	Yes

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			and Roefs (2009)										
160	65	JESP	Hofmann, Rauch, and Gawronski (2007)	Yes	Yes	-	Amount consumed		M&Ms	No	Yes	No	No
161	66	JESP	Major, Hunger, Bunyan, and Miller (2014)	Yes	Yes	-	Calories consumed		Skittles, M&M's, and Goldfish Crackers	No	Yes	No	Yes
162	67	JESP	Muraven, Gagne, and Rosman (2008)	Yes	Yes	1	Forced consumption of one of the two foods (manipulated between subjects)	Radishes	Chocolate cookies	Yes	No	No	No
163	68	JESP	Tice, Baumeister, Shmueli, and Muraven (2007)	Yes	Yes	1	Amount consumed	Drink that was healthful but tasted bad (unsweetened orange Kool Aid mix combined with water and vinegar)		Yes	No	No	No
164				Yes	Yes	4	Forced consumption of one food in presence of the other	Radishes	Cookies and M&Ms	Yes	No	No	No
165	69	JESP	Tong et al. (2016)	Yes	Yes	2	Amount consumed		M&Ms	Yes	No	No	No
166	70	JESP	van Dellen, Sanders, and Fitzsimons (2012)	No	No	1	Appeal ratings (1 = very unappealing; 5 = very appealing)	Tomato, Strawberries, Yogurt, and Bran cereal	Cheeseburger, Soft drink, Cookie, and Sugary cereal	Yes	No	No	No
167				No	No	2	Appeal ratings (1 = very unappealing; 5 = very appealing)	Tomato	Cheeseburger	Yes	No	No	No
168	71	JM	Argo and White (2012)	Yes	Yes	1	Amount consumed		Gum drops	No	Yes	No	Yes
169				Yes	Yes	2	Amount consumed		Candy-coated chocolates	No	Yes	No	No

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170				Yes	Yes	3	Amount consumed		Candy-coated chocolates	No	Yes	No	No
171				Yes	Yes	4	Amount consumed		Candy-coated chocolates	No	Yes	No	Yes
172				Yes	Yes	5	Amount consumed		Gum drops	Yes	Yes	No	Yes
173	72	JM	Deng and Srinivasan (2013)	Yes	Yes	1	Amount consumed		Froot Loops, Cheerios cereal	Yes	No	No	No
174				Yes	Yes	2	Amount consumed		M&Ms cookies, M&Ms candy	Yes	No	No	No
175				Yes	Yes	3	Amount consumed		M&Ms candy	Yes	No	No	No
176				Yes	Yes	4	Amount consumed		M&Ms candy	Yes	No	No	No
177				Yes	Yes	5	Amount consumed	Baby Carrots		Yes	No	No	No
178	73	JM	Garg, Wansink, and Inman (2007)	Yes	Yes	Prelim	Amount consumed		Buttered popcorn	Yes	No	No	No
179				Yes	Yes	1A	Amount consumed		Buttered popcorn	Yes	No	No	No
180				Yes	Yes	2	Amount consumed	Raisins	M&Ms	Yes	No	No	No
181	74	JM	Ma, Ailawadi, and Grewal (2013)	Yes	No (1) Yes (2)	-	Amount purchased; Frequency of multivitamin consumption; Frequency of eating at fast food restaurants	(1) Healthy food categories: Cereal, cheese, juices, milk, soups, yogurt (2) Multivitamins	(1) Unhealthy food categories: Cookies, crackers, soda, frozen dinners, processed meat, ice cream, salty snacks (2) Eating at a fast food restaurants	Yes	No	No	No
182	75	JMR	Belei et al. (2012)	Yes	Yes	1	Amount consumed	Chocolate with antioxidants "Health from the cacao bean"	Low-fat chocolate	Yes	No	No	No
183				Yes	Yes	3	Amount consumed	Chocolate with antioxidants "Health from the cacao bean"	Low-fat chocolate	Yes	No	Yes	No

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184				Yes	Yes	4	Amount consumed	Enriched omega-3 roasted nuts	Low-fat roasted nuts	Yes	No	Yes	No
185				Yes	No	1A	Choice, Calories	Healthy items on the menu (e.g., grilled and baked fish, white meat, and vegetables)	Unhealthy item on the menu (e.g., fried food items and red meat)	Yes	No	No	No
186	76	JMR	Biswas, Szocs, Chacko, and Wansink (2017)	Yes	No	1B	Choice	100-calorie Oreos	Chocolate-covered Oreos	Yes	No	No	No
187				Yes	No	1C	Choice	Granola bar	Chocolate bar	Yes	No	No	No
188				No	No	2A	Choice	Baked potato	French fries	Yes	No	No	No
189				No	No	2B	Choice	Raisins	M&M's	Yes	No	No	No
190				No	No	3	Choice	Organic pasta	Steak	Yes	No	No	No
191				Yes	No	4	Choice	Fresh fruit	Candy bar	No	No	No	Yes
192	77	JMR	Dhar and Wertenbroch (2012)	No	No	5	Choice	Healthy hotel breakfast menu (offering only virtue items)	Unhealthy hotel breakfast menu (with Eggs Benedict and a ham and cheese croissant as vice items)	Yes	No	No	No
193				Yes	No	1	Amount of money spent on vices		Salty snacks, chips, chocolate, candy bars, sweets and chewing gum	Yes	No	No	No
194	78	JMR	Huyghe, Verstraeten, Geuens, and van Kerckhove (2017)	No	No	2	Average vice rating of the shopping basket and relative amount of money spent on vices		Products rated as vices (based on Khan and Dhar 2007 definition of vice virtue)	Yes	No	No	No

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195				No	No	3	Average vice rating of the shopping basket and relative amount of money spent on vices		Products rated as vices (based on Khan and Dhar 2007 definition of vice virtue)	Yes	No	No	No
196				Yes	No	4	Choice	6 virtue snacks (granola bars, cereal biscuits, and fruit)	6 vice snacks (candy bars, candy, chips)	Yes	No	No	No
197				Yes	No	1	Choice	Granola bar	Candy bar	Yes	No	No	No
198	79	JMR	Kidwell, Hasford, and Hardesty (2015)	Yes	Yes	2	Percentage of unhealthy foods eaten; Total calories consumed	Fruits, Vegetables, Whole grains, Lean meats	Processed or deep fried foods, Commercially baked goods, Fatty meats, Canned and refined goods	Yes	No	No	No
199				Yes	No	3	Choice	Granola bar	Candy bar	Yes	No	No	No
200				No	No	Pilot	Choice	Low-Fat Blueberry Muffin (relative virtue)	Chocolate Chip Cookie (relative vice)	Yes	No	No	No
201				No	No	1	Choice between price discount and bonus package (hypothetical)	Chocolates (described as healthy)	Chocolates (described as tasty)	Yes	No	No	No
202	80	JMR	Mishra and Mishra (2011)	No	No	2	Choice between price discount and bonus package (hypothetical)	Raisins	Chocolates	Yes	No	No	No
203				No	No	3	Purchase intention	Fruit salad	Chocolate cake	Yes	No	No	No
204				No	No	4	Choice between price discount and bonus package (hypothetical)	Chocolates (described as healthy)	Chocolates (described as tasty)	Yes	No	No	No

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205				No	No	5	Purchase intention	Raisins	Chocolates	Yes	No	No	No
206	81	JMR	Ramanathan and Menon (2006)	Yes	No	3	Choice (to pick up a cookie); Amount of cookies picked up		Cookies	Yes	No	No	No
207	82	JMR	Sengupta and Zhou (2007)	No	No	2	Choice	Vegetable salad	Chocolate cake	No	Yes	Yes	No
208				No	No	4	Choice	Vegetable salad	Chocolate cake	No	Yes	No	No
209	83	JMR	Trudel and Murray (2011)	Yes	Yes	1A	Amount consumed		Chocolates	No	No	Yes	No
210				Yes	Yes	2	Amount consumed		Chocolates	No	No	Yes	No
211				Yes	Yes	3	Amount consumed		Chocolates	No	No	Yes	No
212	84	JMR	Usta and Häubl (2011)	No	No	2	Choice	Fruit salad	Chocolate cake	Yes	No	No	No
213	85	JMR	Van den Bergh et al. (2001)	Yes	No	1A	Purchase	Wrapping paper, Batteries, Mobile phone cards, Plastic bags, TV program listings	Chocolate bars, Candy, Chewing Gum	Yes	No	No	No
214				Yes	No	1B	Purchase	Orange, Apple	Twix, Mars	Yes	No	No	No
215	86	JMR	VanEpps, Downs, and Loewenstein (2016)	Yes	No	1	Calories ordered	N/A	N/A	Yes	No	No	No
216				Yes	No	2	Calories ordered	N/A	N/A	Yes	No	No	No
217				Yes	No	3	Calories ordered	N/A	N/A	Yes	No	No	No
218	87	JMR	Wang, Novemsky, Dhar, and Baumeister (2010)	Yes	No	2	Choice	Granola bars (Honey Oat and Trail Mix)	Candy bars (Twix and Snickers)	Yes	No	No	No
219				No	No	3	Choice	Stonyfield Farm nonfat plain yogurt	Mrs. Field's milk chocolate chip cookie	Yes	No	No	No
220	88	JMR	Wansink and Chandon (2006)	Yes	Yes	1	Amount consumed	Low fat M&Ms	Regular M&Ms	Yes	Yes	No	No
221				Yes	Yes	3	Amount consumed	Low-fat Rocky Mountain granola	Regular Rocky Mountain Granola	Yes	Yes	No	No

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222	89	JMR	Zhang, Winterich, and Mittal (2010)	No	No	1C	Number of items bought and amount spent		Serving of Oreo cookies, Bag of potato chips, Bag of gummy candies, Serving of Cheetos, Snickers bar, bottle of cola	Yes	No	No	No
223				No	No	3	Number of items bought and amount spent	Granola bar, apple, and orange juice	Snickers bar, potato chips, and regular cola	Yes	No	No	No
224				Yes	No	4	Number of items bought and amount spent	Granola bar, pretzel, bagel, and orange juice	Chocolate bar, Doritos, donut, and cola	Yes	No	No	No
225	90	JPSP	Baumeister, Bratsvlavsky, Muraven, and Tice (1998)	Yes	Yes	1	Forced consumption of one of the two foods (manipulated between subjects)	Radishes	Chocolate chip cookies and chocolate candies	Yes	No	No	No
226	91	JPSP	Baumeister, deWall, Ciarocco, and Twenge (2005)	Yes	Yes	1	Amount consumed	Healthy drink made with drink mix, 1 cup of sugar, 4 cups of water, and 2 cups of vinegar		Yes	No	No	No
227				Yes	Yes	2	Amount consumed		Cookies	Yes	No	No	No
228	92	JPSP	Fishbach, Dhar, and Zhang (2006)	No	No	2	Interest for consuming the items during the day (1 = not at all; 7 = very much)	Fresh fruits, Green vegetables, Bottle of mineral water	Pizza	No	No	Yes	No

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229	93	JPSP	Fishbach, Friedman, and Kruglanski (2003)	No	No	5	(1) Choice; (2) Extent to which food items should be avoided	Apple	(1) Twix chocolate bar; (2) French fries, Chocolate, Cake, Chips, Hamburger, Pizza, and Soda	No	No	Yes	Yes
230	94	JPSP	Fishbach and Shah (2006)	Yes (1 out of 3)	No	5	Multiple choice (number of virtue items chosen out of three)	Yogurt, Fruit salad, Apple	Chocolate bar, Chocolate chip cookies, Bag of chips	No	Yes	Yes	No
231				No	No	1	Appeal ratings (1 = very unappealing; 7 = very appealing)	Five healthy foods (e.g., strawberry, tomato)	Five unhealthy foods (e.g., cheesburger, coke)	Yes	No	No	No
232	95	JPSP	Fishbach and Zhang (2008)	No	No	3	Appeal ratings (1 = very unappealing; 7 = very appealing)	Healthy appetizers (4), entrees (10), and desserts (4), e.g., edamame beans, light chicken salad, fruit plate	Unhealthy appetizers (4), entrees (10), and desserts (4), e.g., fried chicken wings, bacon cheeseburger, and chocolate mousse	Yes	No	No	No
233				No	No	5	Choice	9 healthy courses (entrees and desserts)	9 unhealthy courses (entrees and desserts)	Yes	No	No	No
234				Yes	No	6	Choice	Baby carrots with dip	Hershey's milk chocolate bar	No	No	No	Yes
235	96	JPSP	Giner-Sorolla (2001)	Yes	Yes	3	Amount consumed		Puffed cheese curls, Potato chips, M&Ms, Reese's miniature peanut buttercups	No	No	No	Yes
236	97	JPSP	Inzlicht and Kang (2010)	Yes	Yes	2	Amount consumed		Ice-cream	No	Yes	No	Yes

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237	98	JPSP	Job, Walton, Bernecker, and Dweck (2015)	Yes	Yes	-	Frequency of consumption over the prior week (never, 1 time per week, 2 times per week, 3-4 times per week, 5-6 times per week, 1 time per day, two or more times per day)		Chocolate, Candy bar, and other five unhealthy food items	Yes	No	No	No
238	99	JPSP	Kammrath et al. (2015)	Yes	Yes	3	Forced consumption of one of the two foods (manipulated between subjects)	Radishes	Chocolate chip cookies and chocolate candies	Yes	No	No	No
239				Yes	No	1	Amount consumed (Intention)		Tortilla chips	No	Yes	No	No
240				Yes	Yes	2A	Amount consumed (Intention and actual)		Gummy candies	No	Yes	No	No
241				Yes	Yes	2B	Amount consumed (Intention and actual)	Mini rice cakes		No	Yes	No	No
242	100	JPSP	Lewis and Earl (2018)	No	No	3	Amount consumed (Intention)		Gummy candies	Yes	No	No	No
243				No	No	4	Amount consumed (Intention)	Baby carrots	Gummy candies	No	No	No	Yes
244				No	No	5	Amount consumed (Intention)		Gummy candies	No	No	No	Yes
245				Yes	Yes	6	Amount consumed (Intention and actual)	Carrots, gummies, potato chips, plain M&Ms, roasted and salted almonds, seedless green grapes		No	Yes	No	No
246	101	JPSP	Lisjak, Molden, and Lee (2012)	Yes	No	6	Choice	Apple	Chocolate candy bar	No	No	No	Yes

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247				No	No	1	Choice (1 = definitely M&M's 7 = definitely raisins)	Raisins	M&M's	Yes	No	No	No
248	102	JPSP	Lowe and Haws (2019)	No	No	2	Choice (7-point scale)	Apple, Banana	Cheetos, Doritos	Yes	No	No	No
249				No	No	4	Choice (7-point scale)	Grapes	Skittles	Yes	No	No	No
250				Yes	Yes	5	Amount consumed		Snickers miniatures	Yes	No	No	No
251	103	JPSP	Mead and Patrick (2016)	Yes	Yes	1	Desire for a target temptation selected from the list; average daily consumption of the target temptation over a week (self-report)		Snack foods: ice cream, chocolate, salty snacks, cookies, candy, cake, and 'other' (the 'other' category allowed participants to indicate their own temptation)	No	No	No	Yes
252				Yes	Yes	4	Amount consumed immediately and over a week; desire for M&Ms		M&Ms	Yes	No	No	No
253	104	JPSP	Papies, Pronk, Keesman, and Barsalou (2015)	No	No	2	Choice	10 neutral, healthy food items, e.g., raisin crackers, rice wafers	10 attractive, unhealthy food items, e.g., chips, cheesecake	Yes	No	No	No
254				Yes	Yes	3	Choice, Total calories of the lunch chosen	Bowl of salad	Unhealthy snack item (e.g., fried croquette, cheese puff pastry, donut, muffin)	No	Yes	No	No
255	105	JPSP	Tian et al. (2018)	Yes	Yes	1	Calorie intake	N/A		No	No	No	Yes
256				Yes	No	2	Choice	Baby carrot	Lindt chocolate truffle	No	No	No	Yes
257				No	No	3A	Choice	Odwalla bar	Snickers bar	No	No	No	Yes
258				No	No	3B	Choice	Odwalla bar	Snickers bar	No	No	No	Yes

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259	106	JPSP	Tice, Bratslavsky, and Baumeister (2001)	Yes	Yes	1	Amount consumed		Pretzels, chocolate chip cookies, and small cheese ("goldfish") crackers	No	Yes	No	No
260				Yes	No	3	Choice	Raisin packets	KitKat bars	No	No	No	Yes
261	107	JPSP	Toure-Tillery and Fishbach (2015)	No	No	5	Appeal ratings (1 = not appealing; 7 = very appealing)	Five healthy food items (one starter, three entrées, and one dessert). Examples: garden salad (starter), Lite Grilled Chicken Platter (tender grilled chicken breast served with assorted seasonal vegetables and fresh seasonal fruits), and a fresh fruit plate (dessert)	Five indulgent food items (one starter, three entrées, and one dessert). Examples: deep fried chicken wings (starter), Bacon Cheese Burger (ground chuck patty covered with melted cheddar and crispy bacon, served with French fries), and chocolate mousse (dessert).	No	Yes	No	No
262	108	JPSP	van Dillen, Papies, and Hofmann (2012)	Yes	No	3	Choice	Tangerines and apples	Marzipans and chocolates	Yes	No	No	No
263	109	JPSP	Ward and Mann (2000)	Yes	Yes	1	Amount consumed		Doritos, M&Ms, and chocolate chip cookies	No	Yes	No	No
264				Yes	Yes	2	Amount consumed		Doritos, M&Ms, and chocolate chip cookies	No	Yes	No	No
265	110	ManSci	Mochon et al. (2016)	Yes	No	-	Count of, percentage of, and amount spent on healthy items	Healthy foods (e.g., most fruit, vegetables, fat-free dairy products, lean meats, and whole grains)		Yes	No	No	No

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266	111	MktLett	Kim, Kim, and Park (2018)	No	No	1	Choice	Water bottle, salad, strawberries, Diet Coke	Soda, sandwich, chocolate cake, regular Coke	Yes	No	No	No
267				No	No	2	Choice	Strawberries	Chocolate cake	Yes	No	No	No
268				No	No	3	Amount consumed (Intention)		Hamburger (with different meat-size options)	Yes	No	No	No
269				No	No	4	Amount consumed (Intention)	Apples	Oreo cookies	Yes	No	No	No
270	112	MktLett	Milkman, Rogers, and Bazerman (2010)	Yes	No	-	"Should minus want" score of goods in a customer's basket; proportion of extreme "should" and "want" items in basket	Should grocery items (fresh foods)	Want grocery items (treats, hedonically attractive items)	Yes	No	No	No
271	113	MktLett	Yan et al. (2017)	Yes	No	-	Choice	Low-fat low-sugar or low-calorie baked beans, fresh fruit juices, crisps, and beer	Regular baked beans, fresh fruit juices, crisps, and beer	Yes	No	No	No
272	114	MktSci	Wertenbroch (1998)	Yes	No	1	Quantity purchased (price elasticity)	75% fat-free chips	25% fat chips	Yes	No	No	No
273				Yes	No	2	Reservation prices (price elasticity)	Reduced-fat Oreo cookies	Regular fat Oreo cookies	Yes	No	No	No
274				Yes	No	Field	Sales, price elasticity	Light cream cheese, Light processed cheese, Light and non-alcoholic beer, Diet soft drinks	Regular fat cream cheese, Regular processed cheese, Alcoholic beer, Regular soft drinks	Yes	No	No	No

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275	115	OBHDP	Dholakia, Gopinath, and Bagozzi (2005)	No	No	1	Desire for the sandwich (1 = no desire at all; 7 = very very strong desire); Likelihood to purchase impulsively the sandwich (0 = definitely will not buy; 100 = definitely will buy)	Healthy lunch (generic)	Special gourmet sandwich	Yes	No	No	No

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276				No	No	2	Choice (1 = buy the healthy and low-calorie salad for lunch, not even think about the cheesecake; 2 = buy the healthy and low-calorie salad for lunch, want the cheesecake but not buy it; 3 = decide not to buy the salad and buy the cheesecake instead; 4 = buy both the salad and the cheesecake; 5 = buy both the salad and the cheesecake plus a chicken sandwich to complete the meal	Healthy salad (generic)	Strawberry cheesecake	Yes	No	No	No
277	116	OBHDP	Milkman (2012)	No	No	2A	Choice	Fresh fruit salad	Brownie	Yes	No	No	No
278				Yes	No	3	Choice	Apple	Packet of M&Ms	No	No	No	Yes
279	117	OBHDP	Read and van Leeuwen (1998)	Yes	No	-	Choice	Apple, Banana	Borrelnoten, Mars, Snickers	Yes	No	No	No
280	118	OBHDP	Shiv and Fedorikhin (2002)	Yes	No	1	Choice	Fruit salad	Chocolate cake	Yes	No	No	No
281				Yes	No	2	Choice	Tomato soup	Pizza	No	Yes	No	No
282	119	PSci	Fujita and Han (2009)	No	No	1	Choice	Apple	Candy bar	No	No	No	Yes
283				No	No	2	Choice	Apple	Candy bar	No	No	No	Yes

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284				No	No	3	Choice	Apple	Candy bar	No	No	No	Yes
285	120	Psci	Lim et al. (2018)	No	No	-	Choice	30 healthy food items (e.g., vegetables, fruits, and beans)	30 unhealthy food items (e.g., fast food, sweet desserts, processed meats, and fried food)	Yes	No	No	No
286	121	PSci	Myrseth, Fishbach, and Trope (2009)	No	No	1	Choice	Health bars	Chocolates	No	No	No	Yes
287	122	PSci	Schwartz et al. (2014)	Yes	No	-	Count of, percentage of, and amount spent on healthy items	Healthy foods (e.g., most fruit, vegetables, fat-free dairy products, lean meats, and whole grains)		Yes	No	No	No
288	123	Psci	Stillman et al. 2017	Yes	No	1	Choice	Apple	Candy bar	Yes	No	No	No
289	124	PSci	Sulllivan et al. (2015)	Yes	Yes	-	Choice	Foods having higher healthiness ratings	Foods having higher tastiness ratings	No	No	No	Yes
290	125	PSci	Vohs and Heatherton (2000)	Yes	Yes	1	Amount consumed		Ice-cream	No	Yes	No	No
291				Yes	Yes	3	Amount consumed		Ice-cream	No	No	No	Yes

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