



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Anything you can imagine is possible

Citation for published version:

Cowan, K 2019, 'Anything you can imagine is possible: How imagining can overcome visceral drive states elicited in promotional advertising', *Journal of Business Research*.
<https://doi.org/10.1016/j.jbusres.2019.04.008>

Digital Object Identifier (DOI):

[10.1016/j.jbusres.2019.04.008](https://doi.org/10.1016/j.jbusres.2019.04.008)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

Journal of Business Research

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



Anything You Can Imagine is Possible: How Imagining Can Overcome Visceral Drive States Elicited in Promotional Advertising

1. Introduction

An advertisement flashes on your computer screen, promoting 50% off a new curved screen television, but you only have 24 hours until the offer expires. Promotions like this are designed to stimulate immediate action by urging a visceral state; in fact, marketers count on the effect of visceral cues in promotional advertising (Loewenstein, 2000a). Integrating scarcity, promotional advertisements can lead consumers to behave against their own self-interests (Amos & Grau, 2011; Amos & Spears, 2010) and deviate from long-term goals (Loewenstein, 1996), for example by purchasing the television without regard for their savings goals.

The Theory of Visceral Influences (TVI) suggests that negative emotions aroused by drive states, that is irrational and instinctive urges toward action, inform decision-making, such that eating chocolate cake is more desirable in the immediate present than long-term weight loss goals. Research on TVI, while mostly in the field of psychology and evolutionary biology (c.f. Carmichael & Piquero, 2004; Mischel, 1974; Mischel, Shoda, & Rodriguez, 1992; Van Boven & Loewenstein, 2003), can also be used to explain marketing phenomena in the fields of consumer psychology and advertising. Within marketing, TVI has been used to examine product packaging (Kumar & Noble, 2016), advertising, and consumer decisions, elaborating on how visceral cues stir immediacy, shut off cognition (Amos & Grau, 2011; Amos & Spears, 2010; Langenderfer & Shimp, 2001), inform consumption (Garg, Wansink, & Inman, 2007; Labroo & Patrick, 2009), influence identity (Bell, Burdon, Gregory, & Watts, 2007), and induce aggression (Kristofferson, McFerran, Morales, & Dahl, 2017). It is clear from this research that visceral cues can be harmful for eating, spending, social interactions, and broader life goals (Loewenstein, 2000a).

Little of the research investigating how visceral cues contribute to goal failure demonstrates how to reengage cognitive processing, thwarting the visceral drive state. In their research, Thomas, Desai, and Seenivasan (2011) show that payment in cash rather than credit causes mental pain, and so reduces the urge resulting from visceral cues. Others only theorize as to how visceral cues can be overcome, such as by increasing self-efficacy, the belief that one has the ability to achieve a goal (Schwarzer & Jerusalem, 1995), or by disengaging visceral stimuli processing (Metcalf & Mischel, 1999).

Loewenstein (1996) suggests there are instances where people are less susceptible, including when they make enhanced mental efforts, such as visualization (Loewenstein, 1996). Past research shows that visualization increases self-efficacy (Oettingen, 1996). Despite the importance of this topic in today's environment, where temptation is ever-present, more research is needed to ascertain how people can overcome visceral influences. This is precisely where this research contributes. Two pilot studies and three experiments investigate how visceral temptation can be attenuated, and which underlying mechanism explains the effect. Specifically, the research responds to the following research questions. Can a process such as visualization reduce the desire to give in to visceral temptation? Does self-efficacy underlie this effect, via visualization processes?

2. Literature Review

2.1 The Theory of Visceral Influences (TVI) and Evolutionary Biology

As opposed to non-visceral cues, visceral cues arise from emotions and involve an element of urgency, driving consumers to immediate action (Bell et al., 2007). "At sufficient levels of intensity...visceral factors cause people to behave contrary to their own long-term self-interest, often with full awareness that they are doing so," (Loewenstein 1996, p 272-273). TVI

offers several insights into why visceral temptations threaten goals, such as the opportunity for immediate rewards, or a fixation on hedonic attributes that can intensify emotional drive states (Loewenstein, 2000a). In other words, visceral drive states are triggered by sensory contact with stimuli, such as the reward's physical presence (e.g. seeing chocolate cake) or vividly imagining the hedonic properties of a reward (e.g. imagining the velvety taste of chocolate cake) [Langenderfer & Shimp, 2001; Loewenstein, 1996; Mischel, 1974; Mischel et al., 1989].

This explains why even though a person may not see the cake, the vividness of imagining the hedonic features of the cake recreate the desire to have it as if it were tangible and concrete (Langenderfer & Shimp, 2001). Thus, visceral cues contain two characteristics: hedonic qualities and temporal desirability, resulting in a struggle between willpower and temptation (Hoch & Loewenstein, 1991). The lack of self-control experienced heightens desire and limits rational decision-making (Garg et al., 2007; Heyman, Mellers, Tishchenko, & Schwarz, 2004; Loewenstein & Elster, 1992). Evolutionary research demonstrates that the vividness of visceral cues or imagining cues viscerally triggers the release of testosterone (Book, Starzyk, & Quinsey, 2001; Cesario, Plaks, & Higgins, 2006; Goldey & van Anders, 2001; Rines & von Saal, 1984). As a result, consumers act urgently, without considering consequences (Terberg & van Honk, 2013). While this was beneficial for our ancestors because it engaged the *fight or flight* instinct, drawing attention to food resources when available or signaling potential danger, today, visceral drives can limit effective decision-making (Griskevicius et al., 2009; Saad, 2011).

According to TVI, all stimuli are processed through a dual system of hot (i.e. acting without thinking, a “go” urge) and cold (i.e. acting with cognitive deliberation, a reflection state) (Loewenstein, 2005), consistent with hedonic and utilitarian and affective and cognitive processing. Because emotions (hot system) drive behavior when exposed to visceral stimuli,

people undertake less cognitive processing (Amos & Grau, 2011) and undergo an attention-narrowing effect, ignoring self-interest to pursue visceral temptation (Labroo & Patrick, 2009; Loewenstein, 2000a; Nowlis et al., 2004). For example, consumers who want to quit smoking, diet, or save money set goals, but then fail to predict the urges they feel when facing a cigarette, molten chocolate cake, or a good offer. Instead, when exposed to these vivid temptations, consumers cannot help but think of how much they want the cigarette, the cake, or to shop.

Though visceral influences decline over time, emotional drive states cause people to act in line with visceral drives (e.g. drives for anger beget violence, drives centered around sex trigger mating motives, etc.; Loewenstein, 1996). The cold system, cognitively based, allows people to keep goals in mind as they pursue them, facilitating perceptual processes (McClure, Laibson, Loewenstein, & Cohen, 2004; Metcalfe & Mischel, 1999). People tend to think more logically about temptation when in a cold state. However, in the presence of visceral stimuli, the hot system processes the information (Loewenstein, 2005), so emotions and speed dominate decision-making (Carmichael & Piquero, 2004). In these instances, behavioral intentions become unreliable as a result of visceral drive (Sainam, Putsis, & Zauberaman, 2018).

In online promotional advertisements, the context of this study, because advertisers simulate the consumption experience (Koehler, 1991), vividness and reward proximity heighten consumers' emotional response (Amos & Grau, 2011; Amos & Spears, 2010) and inform offer evaluations without the help of cognitive resources (Langenderfer & Shimp, 2001; Loewenstein, 1996; Lurie & Mason, 2007; Nordgren & Chou, 2013). For instance, promotional deals, before and after images, customer testimonials, bright color, temporal proximity, vividness, sampling, and scarcity tactics are often used in promotional advertising (Amos & Grau, 2011; Amos & Spears, 2010; Kristofferson et al., 2017; Loewenstein, 1996; Wadhwa, Shiv, & Nowlis, 2008). In

fact, these cues increase physical and sensory proximity, and, surprisingly, consumers' tendency to skepticism does not influence the urge generated by visceral cues (Amos & Grau, 2011). Moreover, when offers expire soon, or may be snapped up by somebody else, this can induce urgency (Kristofferson et al., 2017; Loewenstein, 1996). Time pressure forces people in a hot state to make quick decisions (Loewenstein, O'Donoghue, & Rabin, 2003) because it offers a significant economic saving for a specific window only (Cialdini, 2009; Hoch & Loewenstein 1991; Sharma & Alter, 2012).

Scarcity, an implied imbalance between demand and supply, results from a real or artificially induced shortage (Cialdini, 2009; Gitlin, 2007; Verhallen & Robben, 1994). In promotions, scarcity creates a more visceral, emotional reaction from consumers. Thus, it generates more positive evaluations of the advertisement, reduced cognitive functioning, poor decision making and the neglect of long-term interests (Gabler, Landers & Reynolds, 2017; Kukar-Kinney, Scheinbaum, & Schaefer, 2016; Lynn, 1992; Mani et al., 2013; Mullainathan & Shafir, 2013; Verhallen & Robben, 1994). In promotional advertising, scarcity limits availability through quantity or deadlines on the deal (Ku, Kuo, & Kuo, 2012). Given that when exposed to ads with visceral cues, including vivid imagery and scarcity cues, the hot system activates and informs consumer decisions, part of the challenge with visceral stimuli is that one tends to disregard everything else, including logic. So how can people avoid processing visceral temptations using the hot system, which triggers immediate actions contrary to long-term self-interests? According to Loewenstein (1996) and others (see Schwarzzer & Renner, 2000), people can avoid visceral states when they have adequate self-efficacy.

2.2 Self-Efficacy

When somebody sets a goal, he/she inevitably faces temptation, either contrary to the goal (e.g. a dessert) or as an alternative way of accomplishing the goal (e.g. diet pills). In both cases, the person needs sufficient self-efficacy to reject temptation and continue to pursue the goal. Self-efficacy, the belief in the self as capable of overcoming obstacles to achieve a desired result (Schwarzer & Renner, 2000), results in efforts made toward a goal (Gist & Mitchell, 1992). Psychologically, self-efficacy reduces the desire for a reward and changes motivations (Hoch & Loewenstein, 1991). Some antecedents of self-efficacy include experience and assessment of personal resources and constraints (Locke, Frederick, Lee, & Bobko, 1984).

So, extensive personal resources, few goal barriers, positive self-talk, and prior success lead individuals to feel greater self-efficacy. Accordingly, consumers can build self-efficacy through imagining (i.e. visualizing) goal attainment (Taylor et al. 1998) and exhibiting mindfulness (Celsi, Nelson, Dellande, & Gilly, 2017). By merely imagining an action, people activate the muscles that correspond to that action (Korn & Johnson, 1983), which improves actual behavior (Koehler, 1991). Oettingen (1996) argues that mental efforts via imagining (i.e. visualizing) enhances efficacy, and lead to greater goal commitment. In this case, imagining envisions the yet-to-be-experienced, combining existing information with the unknown (Cowan & Dai, 2014) and often yields results consistent with imagined futures (Koehler, 1991; Sherman, Cialdini, Schwartzman, & Reynolds, 1985).

While imagining can help overcome temptation in the short-term (Celsi et al., 2017), and imaginary visualizations can help people focus on long-term goal progress (Oettingin, 1996), visualization can clearly help people overcome temptation in the long-term, even visceral temptation. However, not just any type of visualization process works. Rather, because personal resources and positive self-talk lead to self-efficacy, it is also important to experience negative

visualization of impending realities because it builds realistic estimations of personal resources and a more realistic vision to engage in self-talk. Only by both positive and negative imaginings will people feel less tempted to abandon their goals, regardless of difficulty or past commitment (e.g. Milne, Orbell, & Sheeran, 2002; Oettingen, Mayer, Thorpe, Janetzke, and Lorenz, 2005). In contrast, using only one valence (positive or negative) leads to overconfidence or no confidence. From here forward, the three imagining (i.e. visualization) strategies are termed balanced (i.e. visualization of positive outcomes and negative obstacles), negative (i.e. visualization of only negative obstacles), and positive (i.e. visualization of only positive outcomes) imaginings.

2.3 The Effect of Visceral Cues on Imagining

Overconfidence involves positive imagining, independent of probability. While positive intentions increase motivation, overconfidence from positive imagining only does not (Gollwitzer & Oettingen, 1998; Oettingen, 1996). Positive imaginings overestimate willpower and can be destructive, because people subject themselves to temptation, and have low self-control (Loewenstein, 2000b). In this case, self-efficacy would be excessive and have a disastrous impact on individual goal pursuit because of falsely held beliefs (Oettingen, 1996). When efficacy is at a false high, individuals are vulnerable to visceral cues, including those that propose alternative ways of achieving goals (Parks-Stamm et al., 2007). Because any type of temptation (an easy alternative to the goal or a deviation from the goal) will focus attention on the reward offered by the temptation, consumers will be less prepared to deal with a temptation, experience stronger urgings, and, when the temptation has visceral aspects, will be more responsive to a tempting advertisement.

Likewise, those who dwell only on negative imaginings consider only obstacles that can prevent them from achieving their goals. When people dwell on negative imaginings, they do not focus on the goal, and are easily distracted by temptations (Oettingen et al., 1995), contrary to or consistent with the goal. The presence of visceral cues in an ad will affect those using a negative imagining strategy. In this case, self-efficacy will be too low, because they will not have the resources to overcome temptation, and only assess the obstacles or constraints to a goal (Gist and Mitchell, 1992; Locke et al., 1984).

Only a balance imagining strategy should produce a moderately high level of self-efficacy, adequate for goal pursuit because balanced imaginings highlight constraints and personal resources, facilitating positive implementation intentions. Therefore, people with such imaginings should feel more confident and better able to overcome temptation. Thus, the interaction between the temptation and imagining strategy will affect responses toward the ad through self-efficacy, leading to the hypotheses below.

***H1:** When exposed to an ad with visceral cues, those in the positive or negative (vs. balanced) imagining strategy will report more favorable responses toward the ad.*

***H2:** Imagining strategy and visceral cues will interact to influence responses toward the ad, such that imagining strategy will moderate the main effect of visceral cues on responses toward the ad; only positive and negative imagining strategies lead to more favorable responses toward the ad when exposed to ads with (vs. without) visceral cues.*

***H3:** Self-efficacy mediates the effect of the interaction of imagining strategy and visceral cues on responses toward the ad.*

3. Methodology

3.1 Pilot Study 1: Savings Goals

The purpose of the pilot study was two-fold. The first goal was to test whether assigning a savings goal of \$700 to participants would make the assigned goal desirable and increase intentions to implement the goal. Additionally, after confirming the successful manipulations of the imagining strategy conditions the secondary goal concerns testing the first hypothesis, so that with regard to the online advertisement, balanced (vs. negative and positive) imaginings will lead to less favorable responses toward than ad.

3.1.1 Procedure and sample

A total of 94 responses ($M_{age} = 21$; 55.3% male) were collected in the behavioral lab of a large American University. The study design consisted of one factor manipulated on three levels (imagining strategy: positive vs. negative vs. balanced).

An introduction informed participants that they were taking part in a series of studies, with the first investigating how daydreaming affects goals (Oettingen, 2012). First, participants were randomly assigned to one of the three conditions to all involving a savings goal of \$700. Specifically, in the positive imagining condition, participants listed and ranked four positive aspects of achieving the savings goal and then visualized what these futures would look like for the two top ranked items, describing them in an essay. Participants in the negative imagining condition received the same instructions, but the wording referred to negative impending realities and obstacles. Finally, those in the balanced imagining condition received both sets of instructions, but wrote about the top item on each list: positive and negative.

On the next screen, participants were introduced to a different study, helping a new cruise line test its advertising. They viewed the online ad created for a fictional spring break cruise with BigCruise Company, incorporating cues (a 10% offer expiring in one week with customer testimonials were included) that other researchers have found to be visceral (Amos & Spears, 2010). Subsequently, participants evaluated the advertisement using 7-point semantic-differential scales, including five items on attitude toward the cruise (e.g. unappealing/appealing, bad/good; $\alpha = .96$), attitude toward the ad (e.g. dislike/like; offensive/tasteful; $\alpha = .94$), and purchase intentions (never/definitely; definitely not/definitely buy; $\alpha = .98$), using the items developed by Lavack, Thakor, & Bottausci, (2008). These three variables were analyzed as a second-order construct measuring responses toward the ad ($\alpha = .89$). Next, participants responded to several items, using 7-point Likert scales, to measure four covariates: locus of control (“To what extent does saving \$700 depend on external circumstances,” “To what extent does saving \$700 depend on personal responsibility?” 1 = not at all; 7 = totally); tendency to plan, (“I constantly plan for the future” and “I prefer to make up my own future as I go,” 1 = not at all; 7 = totally); experience of cruises (1 = never; 7 = very often); and deal proneness (1 = not at all, 7 = very). On the next screen, participants completed manipulation check. Following Oettingen (2012), the questionnaire asked participants to complete four sentences from a list of eight sentence stems (e.g. “I will not...”, “Until...I will..”, etc.), where only four suggest plan formation. An index was created by totaling the number of plan formulation stems (scores ranged from 0 to 4). Finally, participants provided demographic information before being debriefed.

3.1.2 Results and discussion

An ANCOVA with imagining strategy (positive = 0, negative = 1, balanced = 2) as the independent variable and the plan formation index as the dependent variable yielded the expected significant effect ($F(1, 92) = 2.55; p < .05$). Post hoc analysis revealed only significant differences between balanced and each of the other conditions. Plan formation was greater in the balanced ($M = 2.00$) than the positive ($M = 1.60; p < .03$) or negative ($M = 1.70; p < .05$) conditions. Therefore, the manipulation was successful.

An ANCOVA with the imagining strategy as the independent variable, the covariates, and responses toward the ad as the dependent variable, yielded a significant effect ($F(1, 93) = 2.86; p < .04$). Post hoc analysis indicated less favorable responses toward the ad in the balanced ($M = 2.98$) than either the negative ($M = 3.64; p < .02$) or positive ($M = 3.26; p < .05$) condition.

These results validate that assignment of a goal (e.g. saving \$700 in a year) results in implementation intentions as if the participant create the goal himself/herself. Likewise, the results provide evidence of the manipulation of imagining strategy conditions, and indicate initial support for hypothesis 1. Consistent with predictions, participants in the positive and negative conditions reported more favorable responses toward the ad than those assigned the balanced imagining condition. Thus, the manipulations were successful and visceral cues were less influential on those with balanced imaginings. The next study tests health and wellness goals.

3.2 Pilot Study 2: Health and Wellness Goals

The goals of pilot study 2 were to generalize the imagining conditions more broadly. Therefore, the goals were self-selected rather than assigned. The temptation advertised, though consistent with the target goal, represented another means of achieving that goal, in line with the adage of giving a man a fish rather than teaching him how to fish. Della Vigna and Malandienier

(2002) find that consumers tend to overpay for health clubs per month, overestimating their commitment to exercise. It is expected to replicate the results of the first pilot study.

3.2.1 Procedure and sample

A total of 62 ($M_{age} = 21$; 40.6% male) responses were collected in the behavioral lab of a large American University. The study design consisted of one factor manipulated on two levels (imagining strategy: negative vs. balanced).

Once again, a questionnaire invited participants to take part in a series of studies, with the first investigating daydreaming. They wrote a specific health and wellness goal for the year, and the system randomly assigned them to one of the two imagining strategies, identical to the two conditions used in pilot study 1. Next, the participants evaluated an online advertisement for a local gym. In this case, the visceral cues comprised a promotional free membership within a valid time, customer testimonials, and before and after images as used previously in the health and wellness context (Amos & Spears, 2010). The fine print said that consumers must sign up for at least twelve months, consistent with Della Vigna and Malmendier's (2006) claim that gym memberships often work to the disadvantage of consumers, forcing them to sign up for a year or more. The dependent variables, manipulation checks, and covariates were the same as in pilot study 1, but modified for the gym context (responses toward the ad: $\alpha = .94$). Finally, participants provided demographic information before being debriefed.

3.2.2 Results and discussion

An ANCOVA with imagining strategy (negative = 0, balanced = 1) as the independent variable and the plan formation index as the dependent variable yielded the expected effect ($F(1, 60) = 5.37$; $p < .01$), where participants primed with the balanced imagining condition completed

more sentences with plan formation intentions ($M = 2.30$) than those in the negative imagining condition ($M = 1.76$). The manipulation was successful.

An ANCOVA with imagining strategies as the independent variable, the covariates, and responses toward the ad as the dependent variable yielded a significant effect ($F(1, 60) = 2.54; p < .05$), where participants experienced less favorable responses toward the ad in the balanced ($M = 4.80$) than negative ($M = 5.14$) imagining condition, consistent with expectations.

These results replicate the findings from the first pilot study and introduce greater generalizability through the context, the goal assignment, and the type of temptation. Collectively, pilot studies one and two provide initial support for hypothesis 1. In the next main study, the goal is to compare how participants in varying imagining strategies respond to tempting online ads with and without visceral cues, which is one of the major goals of this research. In doing so, study 1 tests hypothesis 2.

3.3 Study 1: Saving Goal and Temptation to Spend

The two goals of study 1 are to elaborate on the pilot studies and evaluate hypothesis 2. Specifically, a main effect of visceral cues is expected such that they improve responses toward the ad by vividly depicting the temptation and making the offer more tangible, and thus spurring an emotional reaction (Amos & Grau, 2011; Amos & Spears, 2010; Loewenstein, 2005). However, consistent with the hypotheses, the imagining strategy should moderate the relationship between visceral cues and responses toward the ad, so that those using a balanced imagining strategy experience similar responses toward the ad across visceral cue conditions.

3.3.1 Procedure and sample

A total of 184 ($M_{age} = 22$; 41% male) responses were collected in the behavioral lab of a large American University. The study design consisted of two manipulated factors, one on two levels (visceral cues: absent vs. present) and the other on three levels (imagining strategy: positive vs. negative vs. balanced).

Participants received the same cover story, instructions (in the same order), and stimuli as in pilot study 1. As in pilot study 1, the \$700 savings goal was assigned. The online advertisement was the one used in pilot study 1, but modified to manipulate visceral cues, absent versus present. An altered ad without visceral cues eliminated the customer testimonials and de-emphasized the deadline for participation. The following screens required participants to provide responses regarding the same dependent variables (responses toward the ad: $\alpha = .88$), covariates, and manipulation checks. To check the manipulation of visceral cues, participants indicated to what extent they believed the promotional offer “required urgency,” “provided limited time to participate,” and “included vivid features” with the average providing a measure of promotional urgency driven by visceral cues (1 = not at all, 7 = very much; $\alpha = .74$). Lastly, respondents provided demographic information before being debriefed.

3.3.2 Results and discussion

An ANOVA with the imagining strategy (positive = 0, negative = 1, balanced = 2), visceral cues (absence = 0, presence = 1), and their interaction term as the independent variables and the plan formation index as the dependent variable only yielded a significant effect for imagining strategy ($F(1, 182) = 2.42$; $p = .05$). Participants in the balanced imagining condition completed more plan formations ($M = 2.43$) than participants in the negative ($M = 1.91$; $p < .05$) and positive imagining ($M = 1.89$; $p < .04$) conditions. To examine the manipulation of visceral

cues, the same ANOVA was run with the visceral urgency scale as the dependent variable. As expected, the ad with visceral cues present ($M = 5.89$) versus absent ($M = 3.32$) scored higher in urgency ($F(1, 182) = 150.88, p < .001$). Thus, both manipulations were successful.

An ANCOVA with imagining strategy, visceral cues, and their interaction terms as the independent variable, the covariates, and responses toward the ad as the dependent variable, yielded a significant main effect of visceral cue presence, such that the presence of visceral cues resulted in more favorable responses toward the ad ($M = 4.76$) compared to when absent ($M = 4.37; F(1, 182) = 5.42; p < .01$). Importantly, there was a significant imagining strategy \times visceral cue interaction on responses toward the ad ($F(1, 182) = 2.99; p < .05$).

Planned contrasts revealed that in the positive imagining condition, participants had more favorable responses toward the ad when the advertisement included visceral cues ($M = 5.01$) than when it did not ($M = 4.35; F(1, 182) = 4.31; p < .02$). Similarly, in the negative imagining condition, participants reported more favorable responses toward the ad when the advertisement included visceral cues ($M = 4.76$) than when it did not ($M = 4.23; F(1, 182) = 7.49; p < .005$). However, those in the balanced imagining condition experienced no difference in responses toward the ad between the ads with and without visceral cues ($M = 4.47$ and $M = 4.50; p > .1$).

These results support hypothesis 2. In other words, imagining strategy moderates the main effect of visceral cues in advertisements, whereby the presence (vs. absence) of visceral cues improves responses toward the ad in the positive and negative imagining conditions but not in the balanced imagining condition. Likewise, with visceral cues present, those who engage in balanced imaginings experience less favorable responses toward the ad than those who only experience positive or negative imaginings. Additionally, these results corroborate the findings from the pilot studies and provide additional support for hypothesis 1. The next study explores

whether the same effects occur when the temptation experienced is consistent with the participant's goals, as in pilot study 2.

3.4 Study 2: Saving Money Goal and Temptation to Savings Commitment

The goals of study 2 are twofold. First, the study aims to enhance the robustness of study 1 and the pilot studies by investigating the same money-saving context as in study 1, but providing a temptation consistent with the money-saving goal, as over-commitment can negatively impact efforts made toward a goal (Della Vigna & Malandeni, 2002). Moreover, Loewenstein (1996) contends that visceral cues can often get consumers committed to a money-spending program with no long-term value. The online advertisement developed for this study evokes just that, appealing to consumers' desire to save money while locking consumers into a 12-month commitment with a minimum cost per month. Thus, this study again examines hypothesis 2, with the expectation that imagining strategy will moderate the relationship between visceral cues and responses toward the ad. Moreover, a second goal of this study is to evaluate hypothesis 3 with self-efficacy as a mediator. In line with the arguments outlined earlier, negative (positive) imaginings should result in excessively low (high) self-efficacy, which makes goal pursuit less effective. However, adequate levels of self-efficacy can result from balanced imaginings, which improve short- and long-term goal pursuit.

3.4.1 Procedure and sample

A total of 162 ($M_{age} = 37$; 44% male) responses were collected from Mturk. The study design consisted of two manipulated factors, one on two levels (visceral cues: absent vs. present) and the other on three levels (imagining strategy: positive vs. negative vs. balanced).

Participants received the same cover story and instructions (in the same order) as in study 1, with the \$700 savings goal. The online advertisement for this study featured a financial savings assistance program, free for the first two months but with a cost of \$2 per month afterward and a 12-month commitment. The ad with the visceral cues emphasized the deadline for taking advantage of the two-month free offer and included testimonials. A disclaimer appears in the bottom left-hand corner of the ad in small font, followed by the brand logo for the fictitious First Savings, and a button for enrollment. The disclaimer says, “*Free for first 2 months. After initial month, the savings program is as low as ONLY \$2 per month.” Next, participants responded to items measuring the same dependent variables (responses toward the ad: $\alpha = .92$) and covariates, and then completed Schwarzer and Jerusalem’s (1995) self-efficacy scale (1 = not at all true, 7 = very true; $\alpha = .93$). Finally, participants provided responses to the manipulation checks (visceral urgency: $\alpha = .60$) and demographic information before debriefing.

3.4.2 Results and discussion

An ANOVA with imagining strategy (positive = 0, negative = 1, balanced = 2), visceral cues (absence = 0, presence = 1), and their interaction term as the independent variables and the plan formation index as the dependent variable only yielded a significant effect for imagining strategy ($F(1, 160) = 2.88; p < .04$). Participants primed with balanced imaginings completed more plan formation sentences ($M = 2.34$) than participants with negative ($M = 2.07; p < .05$) and positive imaginings ($M = 2.06; p < .05$). To examine the manipulation of visceral cues, the same ANOVA was run with visceral urgency as the dependent variable. The ad including visceral cues scored higher in urgency ($M = 5.30$) than the one that did not ($M = 4.58, F(1, 160) = 17.23, p < .001$). Thus, both manipulations were successful.

An ANCOVA with imagining strategy, visceral cues, and their interaction terms as the independent variable, external locus of control ($p < .001$) and deal proneness ($p < .01$) as covariates, and responses toward the ad as the dependent variable yielded a main effect of visceral cues. Their presence made responses toward the ad more favorable ($M = 4.63$) compared when absent ($M = 4.08$; $F(1, 160) = 2.12$; $p < .04$, one-tailed). A significant imagining strategy x visceral cue interaction on responses toward the ad emerged ($F(1, 160) = 3.14$; $p < .04$).

Planned contrasts revealed that in the positive imagining condition, responses toward the ad were more favorable when visceral cues were present ($M = 4.94$) versus absent ($M = 3.76$; $F(1, 160) = 6.42$; $p < .005$). Likewise, for those primed with the negative imagining condition, responses toward the ad were more favorable when visceral cues were present ($M = 4.87$) versus absent ($M = 4.04$; $F(1, 160) = 3.98$, $p < .02$). However, the responses toward the ad, for those primed with balanced imaginings, did not differ whether the visceral cue was present ($M = 4.20$) or absent ($M = 4.44$; $p > .1$).

To examine whether self-efficacy mediates the relationship between the interaction between visceral cues and imagining strategy on responses toward the ad, PROCESS Model 8 was employed with self-efficacy as the mediator (Preacher, Rucker, & Hayes, 2007; Hayes 2009). Because the moderator had 3 levels, Hayes (2012) recommends the creation of two dummy variables for the moderator, and the running of two regression models. In the first, one dummy variable is the moderator and the second is a covariate. For the first regression equation, visceral cues presence (0 = absent, 1 = present) was the independent variable, negative imagining was the moderator (0 = negative, 1 = others), balanced imagining was a covariate (0 = balanced, 1 = others), responses toward the ad were the dependent variable, and self-efficacy was the mediator. The 2-way interaction on the mediator was significant ($\beta = .76$; $t = 2.60$; $p = .01$).

Given the significance of self-efficacy as a predictor of responses toward the ad ($\beta = .22$; $t = 2.12$; $p = .04$), the decrease in significance of the interaction on responses toward the ad ($\beta = .22$; $t = .45$; $p = .66$), and the significant indirect effect of the highest order (Index = .21; 95% CI: LL: .03, UL: .54), self-efficacy receives initial support as a mediator.

A second regression was run with visceral cues presence (0 = absent, 1 = present) as the independent variable, balanced imagining as the moderator (0 = balanced, 1 = others), negative imagining as a covariate (0 = negative, 1 = others), responses toward the ad as the dependent variable, and self-efficacy as the mediator. When including the mediator and the interaction in the model on responses toward the ad, self-efficacy significantly predicted responses toward the ad ($\beta = .28$; $p < .02$) while the 2-way interaction became insignificant ($\beta = -.14$; $p > .7$). More importantly, the indirect effect of the highest order was significant (Index = .10; 95% CI: -.44, -.003), supporting self-efficacy as a mediator.

These results provide additional support for hypothesis 2 and initial support for hypothesis 3. Specifically, the results suggest that imagining strategy moderates the main effect of visceral cue presence in advertisements, and these results hold for advertisements that feature temptation consistent with personal goals. While negative or positive imagining strategies are subject to the influence of visceral cues in advertisements, those who experienced balanced imaginings have similar responses toward promotional advertisements, regardless of whether visceral cues are present. The results also indicate that balanced imaginings contribute to enhancing self-efficacy, which then leads to goal-consistent responses. These results provide the motivation to examine self-efficacy more thoroughly in study 3.

3.5 Study 3: Self-Efficacy Manipulated

The goal of study three is to provide more robust evidence of self-efficacy as a mediator for the relationships hypothesized using mediation by moderation. It is predicted that when assigning a self-efficacy level consistent with the imagining strategy condition (e.g. high self-efficacy and balanced imagining; low self-efficacy with negative imagining), the results and interaction patterns from Study 1 and Study 2 will be replicated. On the other hand, when a participant's self-efficacy condition differs from the imagining strategy (e.g. low self-efficacy and positive imagining; high self-efficacy and negative imagining), according to the hypothesized relationships, responses toward the ad should be consistent with balanced imagining strategy, because both positive and negative imaginings will be engaged.

3.5.1 Procedure and sample

A total of 248 ($M_{age} = 22$; 40% male) responses were collected in the behavioral lab of a large American University. The study design consisted of three manipulated factors, two on two levels (visceral cues: absent vs. present) and (self-efficacy: high vs. low) and the other on three levels (imagining strategy: positive vs. negative vs. balanced).

Participants received the same cover story and instructions (in the same order) as in pilot study 2, and self-assigned a health and wellness goal. After completing the imagining strategy manipulation, participants were randomly assigned to a self-efficacy condition. For this manipulation, they took a health inventory assessment focusing on running and jogging, which in line with McAuley, Talbot, and Martinez (1999) provided them with a score on a 100-point sliding scale from 100% (complete confidence) to 0% (no confidence at all). Upon completion of the assessment, participants were randomly assigned feedback consistent with either the high

efficacy or low efficacy condition, as in Marquez, Jerome, McAuley, Snook, and Canaklisova (2002). Those in the high efficacy condition received congratulations for being in the top 20% of their peer group, and a reminder to stay healthy. Those in the low efficacy condition were informed that they were in the bottom 20% of their peer group, advised to change habits, and encouraged to reverse the results.

Next, participants were shown the same advertisement for the gym as in pilot study 2. The ad version without visceral cues only had “after” pictures (not before), lacked the testimonials, and did not emphasize the deadline. After viewing the advertisement, participants responded to items covering the dependent variables (responses toward the ad: $\alpha = .86$) and covariates. On the next screen, participants answered manipulation check items, including visceral urgency ($\alpha = .60$). To check the self-efficacy manipulation, participants responded to a single item, “I have a higher health and wellness score than my peers,” on a 7-point Likert scale. Finally, they provided demographic information before being debriefed.

3.5.2 Results and discussion

An ANOVA with imagining strategy (positive = 0, negative = 1, balanced = 2), self-efficacy (low = 0, high = 1), visceral cues (absence = 0, presence = 1), and their interaction terms as the independent variables, and the plan formation index as the dependent variable only yielded a significant effect for the imagining condition ($F(1, 246) = 10.86; p < .01$), with those in the balanced condition completing more sentences ($M = 2.28$) than those in the negative ($M = 1.89; p < .01$) or positive imagining conditions ($M = 1.85; p < .01$). To examine the self-efficacy manipulation, the ANOVA with self-efficacy as the dependent variable only yielded a main effect for self-efficacy, where those in the low self-efficacy condition reported feeling less

healthy ($M = 3.20$) than those in the high self-efficacy condition ($M = 5.61$; $F(1, 246) = 130.59$; $p < .001$). An ANOVA with the visceral urgency scale only provided a main effect for visceral cues, so visceral cues generated more urgency ($M = 6.15$) than when they were absent ($M = 5.89$; $F(1, 246) = 4.36$, $p < .01$). Thus, all manipulations were successful.

An ANCOVA with imagining strategy, visceral cues, and their interaction terms as the independent variable, significant covariates of external locus of control ($p < .05$) and deal proneness ($p < .001$), and responses toward the ad as the dependent variable yielded a significant main effect of self-efficacy. Those exposed to the high self-efficacy condition reported less favorable responses toward the ad ($M = 3.86$) than those in the low self-efficacy condition ($M = 4.12$; $F(1, 246) = 3.71$; $p < .02$). Importantly, there was a significant imagining strategy x self-efficacy x visceral cue interaction on responses toward the ad ($F(1, 246) = 8.22$; $p < .001$).

Planned contrasts within each imagining strategy condition revealed results consistent with hypotheses. As predicted, in the balanced imagining condition, there was no significant visceral cue x self-efficacy interaction ($F < 1$). However, planned contrasts within the negative imagining condition revealed a significant visceral cue x self-efficacy interaction on responses toward the ad ($F(1, 246) = 6.26$; $p < .01$). As predicted those participants in the negative imagining and high self-efficacy conditions reported no difference in responses toward the ad whether visceral cues were absent or present ($M = 3.58$ vs. $M = 3.67$, respectively; $p > .1$). Yet with low self-efficacy, participants experienced more favorable responses toward the ad with visceral cues present ($M = 5.19$) than when absent ($M = 4.14$; $F(1, 246) = 15.10$; $p < .001$).

Planned contrasts within the positive imagining condition also revealed a significant visceral cue x self-efficacy interaction on responses toward the ad ($F(1, 246) = 15.89$; $p < .001$). Participants in the positive imagining and low self-efficacy conditions actually reported less

favorable responses toward the ad when visceral cues were present ($M = 3.13$) than when they were absent ($M = 4.50$; $F(1, 246) = 13.65$; $p < .001$). On the other hand, when self-efficacy was high, participants experienced more favorable responses toward the ad when visceral cues were present ($M = 4.41$) than when they were absent ($M = 3.86$; $F(1, 246) = 3.44$; $p < .03$).

The results of support the claim that self-efficacy mediates how individuals with varying imaginings approach ads with and without visceral cues. When experiencing a type of imagining (positive, negative, or balanced future), having a balanced imagining strategy produces the ideal level of self-efficacy to avoid succumbing to temptation. However, when negative imagining is paired with high self-efficacy or positive imagining is paired with low self-efficacy, individuals will feel less likely to succumb to temptation congruent or incongruent to achieving goals. However, on their own, one-sided imaginings are not productive for goal pursuit. These results further substantiate hypothesis three.

4. General Discussion and Conclusion

This research provides several implications for academics and practitioners by demonstrating how promotional advertising can elicit visceral drive states that urge consumers to take advantage of an offer incompatible with long-term goals. The pilot studies illustrate that balanced (vs. positive or negative) future visualization can deter urges to take advantage of an advertisement (hypothesis 1). The first and second studies provide evidence that balanced imaginings thwart the urge generated by visceral cues. And while negative or positive imagining strategies result in vulnerability, experiencing balanced imaginings reduces behavioral responses (hypothesis 2). Finally studies 2 and 3 support self-efficacy as a mediator in the relationship between the interaction of visceral cues and imagining strategy and responses toward the ad. While study 2 measures self-efficacy and provides evidence of mediation through PROCESS,

study 3 manipulates self-efficacy and offers more robust support, through mediation by moderation. These results are generalizable due to the use of different contexts (obvious temptation and shortcuts to goal progress), offerings advertised (products and services), and visceral cues (imagery, testimonials, and emphasis on scarcity).

Theoretically, the research suggests first that attitudes toward promotional material indicate goal commitment, based on TVI, as opposed to Oettingen (2000) who examines goal progress through variables such as commitment or energization. Second, the research identifies how peoples' imagining builds or attenuates self-efficacy, which then determines how they respond to promotional temptation; balanced imaginings are resources for goal pursuit. Specifically, positive or negative imaginings alone examine a single reality, either goal achievement or obstacles preventing it, and remain sensitive to the influence of visceral cues. When people experience self-efficacy levels inconsistent with their imagining (e.g. positive imagining with low self-efficacy or negative imagining with high self-efficacy), they are more prepared for visceral influences. More research is needed to examine whether imagining is a good resource to use in other evolutionary biology research, such as overcoming other emotions.

Third, the research links two literatures, on using imagining to set goals, and on the influence of visceral factors to account for individuals' goal commitment versus failure. This research provides a new perspective on goal research, extending understanding of how the cold system (e.g. cognitive, deliberate processing) can intervene between temptations and visceral responses when employing an imagining strategy in combination with TVI. The results extend TVI to include imagining as a goal regulation mechanism, capable of reducing consumer vulnerability to visceral influences. While current scholarship agrees that visceral cues undermine goals, this study contributes new evidence that imagining is beneficial to goal pursuit.

For marketing and public policy practitioners, this research offers evidence that certain groups are more vulnerable to temptation (c.f. Loewenstein, 1996), which raises several ethical issues. First, should public policy regulate the use of visceral cues in advertisements, especially those directed at more vulnerable populations (e.g. the elderly, the chronically stressed, etc.)? Second, what role should the government play in helping these more vulnerable groups use imaginings to set long-term goals? Similarly, pro-social marketers can attempt to educate consumers on how to make better decisions (Dickson & Holmes, 2008). In fact, social marketing efforts coupled with regulatory policy has been particularly effective in motivating more positive consumer behavior (Hogan, Perks, & Russell-Bennett, 2014).

This research also provides evidence that when people are given goals they experience the same patterns of temptations and self-efficacy as with regard self-driven goals. However, more research is needed to understand how people experience both self-assigned and other-assigned goals. Adidas, for instance, has used its knowledge of imagining strategy to set goals for consumers. In a recent campaign targeting athletes, it alluded to the thought that imagining can enhance athletic performance. Since goals can be manipulated, marketers can even stimulate consumer action by providing consumers or employees with certain goals and monitoring them.

As with all research, these studies have limitations. All brands used were fictitious, though using actual brands may affect visceral responses differently. For instance, using Carnival Cruise brand might have increased the legitimacy of the ads, which would then impact attitudes and intentions. Further, field experiments assessing actual behavior would be beneficial. Other potential dependent variables include skin conductance, salivation, brain activity, EMG responses, and heart rate. Looking at different types of marketing communications, such as audio-video or audio only messages, might constitute another avenue for future research.

References

- Amos, C. & Grau, S.L. (2011). Does consumer skepticism negate the effects of visceral cues in weight loss advertising? *International Journal of Advertising*, 30(4), 693-719.
- Amos, C. & Spears, N. (2010). Generating a visceral response: The effects of visceral cues in weight loss advertising. *Journal of Advertising*, 39(3), 25-38.
- Bell, S., Burdon, S., Gregory, J., & Watts, J. (2007). Valuing the visceral: The increasing importance of the rapid affective responses in assessing consumer behavior. *International Journal of Market Research*, 49(3), 299-311.
- Book, A.S., Starzyk, K.B., & Quinsey, V.L. (2001). The relationship between testosterone and aggression: A meta-analysis. *Aggression and Violent Behavior*, 6(6), 579-99.
- Carmichael, S. & Piquero, A.R. (2004). Sanctions, perceived anger, and criminal offending. *Journal of Quantitative Criminology*, 20(4), 371-93.
- Celsi, M.W., Nelson, R.P., Dellande, S., & Gilly, M.C. (2017). Temptation's itch: Mindlessness, acceptance, and mindfulness in a debt management program. *Journal of Business Research*, 77, 81-94.
- Cesario, J., Plaks, J.E., & Higgins, E.T. (2006). Automatic social behavior as motivated preparation to interact. *Journal of Personality & Social Psychology*, 90(6), 893-910.
- Cialdini, R.B. (1993). *Influence: The psychology of persuasion*. New York: William Morrow and Company.
- Cowan, K. & Dai, B. (2014). Who is the "self" that buys?: An exploratory examination of imaginative consumption and explanation of opinion leadership. *Psychology & Marketing*, 31(11), 1008-23.

- Della Vigna, S. & Malmendier, U. (2002). Overestimating self-control: Evidence from the health club industry. Working Paper, University of California at Berkeley & Stanford University.
- Dickinson, S. & Holmes, M. (2008). Understanding the emotional and coping responses of adolescent individuals exposed to threat appeals. *International Journal of Advertising*, 27(2), 251-78.
- Gabler, C.B., Landers, V.M., & Reynolds, K.E. (2017). Purchase decision regret: Negative consequences of the Steadily Increasing Discount strategy. *Journal of Business Research*, 76, 201-8.
- Garg, N., Wansink, B., & Inman, J.J. (2007). The influence of incidental affect on consumers' food intake. *Journal of Marketing*, 71, 194-206.
- Gist, M.E. & Mitchell, T.R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *The Academy of Management Review*, 17(2), 183-211.
- Gitlin, T. (2007). *Media unlimited: How the torrent of images and sounds overwhelms our lives*. New York: Henry Holt.
- Goldey, K.L. & van Anders, S.M. (2011). Sexy thoughts: Effects of sexual cognitions on testosterone, cortisol, and arousal in women. *Hormones and Behavior*, 59(5), 754-64.
- Griskevicius, V., Tybur, J.M., Gangestad, S.W., Perea, E.F., Shapiro, J.R., & Kenrick, D.T. (2009). Aggress to impress: Hostility as an evolved context-dependent strategy. *Journal of Personality and Social Psychology*, 96(5), 980.
- Gollwitzer, P.M. & Oettingen, G. (1998). The emergence and implementation of health goals. *Psychology and Health*, 13, 687-715.

- Hayes, A.F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408-20.
- _____ (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [white paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>
- Heyman, J., Mellers, B., Tishcenko, S., & Schwartz, A. (2004). I was pleased a moment ago: How pleasure varies with background and foreground reference points. *Motivation & Emotion*, 28(1), 65-83.
- Hoch, S.J. & Loewenstein, G.F. (1991). Time-inconsistent preferences and consumer self-control. *Journal of Consumer Research*, 17, 492-507.
- Hogan, S. P., Perks, K.J., & Russell-Bennett, R. (2014). Identifying the key sociocultural influences on drinking behavior in high and moderate binge-drinking countries and the public policy implications. *Journal of Public Policy & Marketing*, 33(1), 93-107.
- Koehler, D.J. (1991). Explanation, imagination, and confidence in judgment. *Psychological Bulletin*, 110(3), 499-519.
- Korn, E R. & Johnson, K. (1983), *Visualization: Uses of imagery in the health profession*. Homewood, IL: Dow Jones-Irwin.
- Kristofferson, K., McFerran, B., Morales, A.C., & Dahl, D.W. (2017). The dark side of scarcity promotions: How exposure to limited-quantity promotions can induce aggression. *Journal of Consumer Research*, 43, 683-706.
- Ku, H, Kuo, C., & Kuo, T. (2012). The effect of scarcity on the purchase intentions of prevention and promotion motivated consumers. *Psychology & Marketing*, 29(8), 541-48.

- Kukar-Kinney, M., Scheinbaum, A.C., & Schaeffers, T. (2016). Compulsive buying in online daily deal settings: An investigation of motivations and contextual elements. *Journal of Business Research*, 69, 691-99.
- Kumar, M. & Noble, C.H. (2016). Beyond form and function: Why do consumers value product design? *Journal of Business Research*, 69, 613-20.
- Labroo, A.A. & Patrick, V.M. (2009). Psychological distancing: Why happiness helps you see the big picture. *Journal of Consumer Research*, 35(5), 800-9.
- Langenderfer, J. & Shimp, T.A. (2001). Consumer vulnerability to scams, swindles, and fraud: A new theory of visceral influences on persuasion. *Psychology & Marketing*, 18(7), 763-83.
- Lavack, A.M., Thakor, M.V., & Bottausci, I. (2008). Music-brand congruency in high-and low-cognition radio advertising. *International Journal of Advertising*, 27(4), 549-68.
- Locke, E.A., Frederick, E., Lee, C., & Bobko, P. (1984). Effect of self-efficacy, goals, and task strategies on task performance. *Journal of Applied Psychology*, 69, 241-51.
- Loewenstein, G. (1996). Out of Control: Visceral Influences on Behavior. *Organizational Behavior and Human Decision Processes*, 65(March), 272-92.
- _____ (2000a). Emotions in economic theory and economic behavior. *American Economic Review*, 90(2), 426-32.
- _____ (2000b). Willpower: A decision-theorist's perspective. *Law and Philosophy*, 19(1), 51-76.
- _____ (2005). "Hot-cold empathy gaps and medical decision making. *Health Psychology*, 24(4S), 49-56.
- Loewenstein, G. & Elster, J. (1992), *Choice over time*. New York: Sage.

- Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection bias in predicting future utilities. *The Quarterly Journal of Economics*, *118*, 1209-48.
- Lurie, N.H. & Mason, C.H. (2007). Visual representation: Implications for decision making. *Journal of Marketing*, *71*(1), 160-77.
- Lynn, M. (1992). The psychology of unavailability: Explaining scarcity and cost effects on value. *Basic and Applied Social Psychology*, *13*(1), 3-7.
- Mani, A., Mullainathan, S., Shafir, E., & Zhao, J. (2013). Poverty impedes cognitive function. *Science*, *341*(6149), 976-80.
- McAuley, E., Talbot, H., & Martinez, S. (1999). Manipulating self-efficacy in the exercise environment in women: Influences on affective responses. *Health Psychology*, *18*(3), 288-94.
- McClure, S., Laibson, D., Loewenstein, G., & Cohen, J. (2004). Separate neural systems value immediate and delayed monetary rewards. *Science*, *306*, 503.
- Metcalf, J. & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychological Bulletin*, *106*(1) 3-19.
- Milne, S., Orbell, S., & Sheeran, P. (2002). Combining motivational and volitional interventions to promote exercise participation: Protection motivation theory and implementation intentions. *British Journal of Health Psychology*, *7*, 163-84.
- Mischel, W. (1974). Processes in delay of gratification. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*, Vol. 7. (pp. 249-292), New York: Academic Press.
- Mischel, W., Shoda, Y., & Rodriguez, M.L. (1989). Delay of gratification in children. *Science*, *244*(4907), 933-8.

- Marquez, D.X., Jerome, G.J., McAuley, E., Snook, E.M., & Canaklisova, S. (2002). Self-efficacy manipulation and state anxiety responses to exercise in low active women. *Psychology and Health, 17*(6), 783-791.
- Mullainathan, S. & Shafir, E. (2013). *Scarcity: Why having too little means so much*. New York, NY: Times Books.
- Nordgren, L. & Chou, E.Y. (2013). A devil on each shoulder: When (and why) greater cognitive capacity impairs self-control? *Social Psychological & Personality Science, 4*(2), 233-7.
- Nowlis, S. M., Mandel, N., & McCabe, D. B. (2004). The effect of a delay between choice and consumption on consumption enjoyment. *Journal of Consumer Research, 31*, 502–10.
- Oettingen, G. (1996). Positive fantasy and motivation. In P.M. Gollwitzer, & J.A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 236-59). New York: Guilford.
- Oettingen, G., Mayer, D., & Losert, A. (2005). Reflective self-regulation of goal relinquishment. Unpublished manuscript, University of Hamburg.
- Parks-Stamm, E.J., Gollwitzer, P.M., & Oettingen, G. (2007). Action control by implementation intentions: Effective cue detection and efficient response initiation. *Social Cognition, 25*(2), 248-66.
- Preacher, K.J., Rucker, D.D., & Hayes, A.F. (2007). Assessing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42*, 185-227.
- Rines, J.P. & vom Saal, F.S. (1984). Fetal effects on sexual behavior and aggression in young and old female mice treated with estrogen and testosterone. *Hormones and Behavior, 18*(2), 117–29.

- Saad, G. (2011). *The consuming instinct: What juicy burgers, Ferraris, pornography, and gift giving reveal about human nature*. New York: Prometheus Books.
- Sainam, P., Putsis Jr., W.P., & Zauberan, G. (2018). What I think I will do versus what I say I do: Mispredicting marijuana use among teenage drug users. *Journal of Business Research*, 85, 317-24.
- Schwarzer, R. & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor: UK: Nfer-Nelson.
- Schwarzer, R. & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy. *Health Psychology*, 19, 487-95.
- Sharma, E. & Alter, A.L. (2012). Financial deprivation prompts consumers to seek scarce goods. *Journal of Consumer Research*, 39(3), 545–60.
- Sherman, S.J., Cialdini, R.B., Schwartzman, D.F., & Reynolds, K.D. (1985). Imagining can heighten or lower the perceived likelihood of contracting a disease: The mediating effect of ease of imagery. *Personality & Social Psychology Bulletin*, 11, 118-27.
- Taylor, S.E., Pham, L.B., Rivkin, I.D., & Armor, D.A. (1998). Harnessing the imagination: Mental simulation, self-regulation, and coping. *American Psychologist*, 53(4), 429-539.
- Terburg, D. & van Honk, J. (2013). Approach–avoidance versus dominance–submissiveness: A multilevel neural framework on how testosterone promotes social status. *Emotion Review*, 5(3), 296–302.
- Thomas, M., Desai, K.K., & Seenivasan, S. (2011). How credit card payments increase unhealthy food purchases: Visceral regulation of vices. *Journal of Consumer Research*, 38(1), 126-39.

- Van Boven, L. & Loewenstein, G. (2003). Social projection of transient drive states. *Personality & Social Psychology Bulletin*, 29(9), 1159-68.
- Verhallen, T.M.M. & Robben, H.S.J. (1994). Scarcity and preference: An experiment on unavailability and product evaluation. *Journal of Economic Psychology*, 15(2), 315–31.
- Wadhwa, M., Shiv, B., & Nowlis, S.M (2008). A bite to whet the reward appetite: The influence of sampling on reward-seeking behaviors. *Journal of Marketing Research*, 45, 405-13.