The Interplay Between Scarcity Appeals and Hyperopia

Francis Gagné Jarry

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By: Francis Gagné Jarry

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Signed by the final Examining Committee:

| | |
|---|---|
| Dr. David Newton | Chair |
| Dr. Darlene Walsh | Examiner |
| Dr. Kamila Sobol | Examiner |
| Dr. Caroline Roux | Supervisor |

Approved by      _____

Chair of Department or Graduate Program Director

_____

Dean of Faculty

August 7, 2019

# ABSTRACT

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Francis Gagné Jarry

Hyperopia is an individual-level trait that leads consumers to exhibit an aversion to indulgence and chronically resist temptations because of their excessive farsightedness. As a result, hyperopic consumers often experience regret and feelings of missing out due to their inability to partake in life's frivolities. While past research has mostly studied hyperopia as a chronic individual difference, the first goal of this thesis is to investigate whether cues in consumers' environment can situationally prompt hyperopic consumption tendencies, building on prior work demonstrating that personality traits can also manifest as personality states.

Prior research has found various ways to help hyperopic consumers overcome their aversion to indulgence and encourage them to "live a little," such as precommitting to indulge, manipulating the level at which the indulgence is construed, or providing a justification to "let loose," among others. The second goal of this thesis is to investigate whether scarcity promotions could provide another means for hyperopic consumers to overcome their aversion to indulgence. Because scarcity promotions are limited in nature, they could serve as a justification mechanism for hyperopic (vs. non-hyperopic) consumers, by allowing them to justify the splurge, and consequently increase their purchase intentions and consumption of indulgences.

Across six studies, this thesis tests i) whether contextual cues can prompt consumers to become hyperopic (studies 1-3) and ii) whether scarcity appeals can overcome hyperopic consumers' aversion to indulgence (studies 4-6), and find mixed results for the proposed effects.

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# Introduction

Consider a consumer who is out at a restaurant to enjoy a meal with friends. While consulting the menu to decide what to order, an entrée with a decadent description catches her eye. She also notices that it is one of the most expensive entrées on the menu. While she is tempted to try the dish, she believes it would be quite unreasonable for her to indulge in this luxurious meal, and instead starts considering more sensible options. One of her friends points out that the entrée is a seasonal dish available for a limited time only. Could this limited-time opportunity manage to overcome the consumer's aversion to indulgence, or would her hyperopic consumption tendencies still make her resist the desire to indulge? This is the main research question I will be investigating in this thesis.

Marketers often use scarcity to increase demand by restraining the perceived availability of products. For instance, companies like Volkswagen and Apple have leveraged, with great success, this "illusion of scarcity" to generate enthusiasm and increase purchase intentions from consumers (Quelch, 2007). One of the ways in which scarcity can be used in marketing is through scarcity promotions or appeals, which usually take on a "limited-quantity" or "limited-time" format. Prior research on the effectiveness of scarcity promotions in marketing has shown that they are robustly successful at increasing consumers' perceived value of a product and purchase intentions (see Lynn, 1991 for a review). Considering our initial example, if scarcity promotions are as effective as the literature suggests, the consumer should be able to overcome her aversion to indulge and order the seasonal offering, since she will be unable to enjoy the dish once the limited-time offer has expired.

However, scarcity appeals may instead fall flat when used for products seen as indulgent or luxurious, especially when presented to indulgence-averse, or hyperopic, consumers. Indeed, prior research on the role of hyperopia on consumers' willingness to indulge has shown that hyperopic individuals tend to exhibit overcontrol and excessive farsightedness, or an inability to deviate from "doing the right thing," which often lead them to experience a great amount of regret later in life (Kivetz and Keinan, 2006). However, prompting hyperopic consumers to consider the anticipated regret that might stem from a decision to act righteously has been shown to help overcome these consumers' hyperopic tendencies, thus allowing them to "live a little" (Kivetz and Keinan, 2006). Consequently, one might posit that scarcity appeals, due to their

temporary nature and thus potential to generate anticipated regret, may produce a similar effect on hyperopic consumers. Further, prior research has shown that consumers are generally more prone to indulge when they can justify the splurge (Kivetz and Zheng, 2006). Scarcity promotions, due to their very nature, could thus provide consumers with a justification to indulge. Going back to our opening example, the hyperopic consumer thus may end up choosing a more reasonable entrée instead of the luxurious dish partly because she believes that she will be able to order it on another, more special occasion, thus helping rationalize her decision and diminishing her potential feelings of regret. However, if the dish is offered only for a limited time, by very definition it is understood that it will not be available again, at least in the near future. The scarcity appeal might then be able to convince the hyperopic consumer to indulge in the luxurious dish by fear of missing out on this opportunity. I will thus also investigate the potential role of scarcity promotions as a justification mechanism for indulging in this thesis.

Additionally, in order to provide relevant implications for marketers, I will also explore whether cues in consumers' environment can situationally induce hyperopic tendencies, in addition to being a chronic individual difference. Building on previous research showing that certain personality traits can also be temporarily activated by situational primes or cues (Sela and Shiv, 2009; Fleeson, 2007), I will test whether exposure to reminders of past foregone opportunities for indulgence prompt consumers to exhibit situational hyperopic tendencies.

Building on prior work, I first propose that scarcity (vs. control) promotions will prompt chronic hyperopic consumers to indulge, both in terms of increasing purchase intentions and actual consumption. I further propose that scarcity promotions will serve as a justification mechanism for hyperopic (vs. non-hyperopic) consumers, by allowing them to justify the splurge, and that this justification will help explain the effect of scarcity promotions on hyperopic consumers' behavior. I finally propose that hyperopic tendencies can also be situationally primed and that the effect of state-level hyperopia will be similar to that of trait-level hyperopia.

The remainder of this thesis is organized as follows. I will first present an overview of the literatures on i) the hyperopia personality trait and its downstream consequences, ii) the relationship between justification and indulging and iii) scarcity promotions, especially in the context of luxuries. I will then draw from this work to suggest that i) cues in consumers'

environment can prompt them to temporarily exhibit hyperopic consumption tendencies similar to those observed in individuals who possess the personality trait and ii) that scarcity appeals, by allowing hyperopic (vs. non-hyperopic) consumers to justify the splurge, will increase purchase intentions and consumption for indulgences. These predictions will then be tested across six studies. Finally, I will conclude with a discussion of the theoretical and practical implications of these findings, their strengths and limitations, and suggestions for future research.

## Theoretical Background

### Hyperopic Consumers Have an Aversion to Indulgence

Hyperopia has been defined as excessive farsightedness, an individual-level trait that leads consumers to exhibit an aversion to indulgence (Kivetz and Simonson, 2002a; Kivetz and Keinan, 2006). Individuals who exhibit hyperopic behavior are more likely to choose "restrictive or necessity option over an indulgent but potentially life-enriching choice" (Haws and Poynor, 2008, p. 681). These findings were replicated and extended by Haws and Poynor (2008), who developed a scale to measure hyperopia as an individual difference and posited that hyperopia operates at a perceptual level. Specifically, the authors argue that hyperopic individuals perceive more products as being "luxurious" rather than "necessary", which would translate in lower purchase intentions for luxuries than for necessities. For instance, in Study 1, participants were asked to categorize 20 products (10 necessities and 10 luxuries) as either luxuries or necessities (1 = "Total necessity", 7 = "Total luxury"). Overall, they found that highly hyperopic individuals exhibited greater luxury ratings than non-hyperopic consumers, which translated into lower purchase intentions for luxuries, but not for necessities. It is noteworthy that self-control was not a significant predictor of one's perception of luxury versus necessity, thus validating the authors' initial hypothesis. The authors' main contribution thus lies in their discrimination of hyperopia from self-control. They argue that previous research showed that individuals high in self-control, unlike hyperopic consumers, can integrate indulgences in their consumption as they understand their role in achieving long-term goals. Hyperopic consumers struggle to indulge even in circumstances where indulging could aid them accomplish an active goal. Further, the authors posit that hyperopic consumers exhibit feelings of missing out and regret from not indulging, contrary to high self-control individuals who do not report these feelings, as they successfully restrict their behavior without exhibiting feelings of dissatisfaction.

Thus far, hyperopia has been studied as a trait, which implies pervasiveness across situations (Fridhandler, 1986; Fleeson, 2007). However, prior research on environmental cues and personality has shown that situational characteristics can induce consumers to exhibit variability in how their personality traits are manifested in that exact moment, which are referred to as personality states (Fleeson, 2007). Fleeson further proposes that this idiosyncratic variability in personality is the result of an adaptive response to the situation. As such, the within-individual variability in the construction of one's personality will directly be impacted by one's perceptions of specific situational cues (Fleeson, 2007). Following this rationale, hyperopia could thus be experienced as an enduring trait, much like Haws and Poynor's (2008) conceptualization, or as a personality state based on the optimal adaptive response to the environment (Fleeson, 2007).

Going back to the opening example where a hyperopic consumer was considering getting a seasonal entrée, what if that consumer's friends was also discussing a recent movie they saw. The consumer remembers that her group of friends had invited her to attend the movie, but that she had declined as an outing did not seem appropriate at the time. Could this sudden recall of her past failure to indulge lead the consumer to reconsider her choice to order (or not order) the limited-time seasonal meal?

**When Are Consumers More Likely to Indulgence?**

Kivetz and Keinan (2006) investigated the potential effect of regret and guilt on hyperopic consumers' decision to indulge. Indeed, hyperopic consumers tend to experience wistful feelings of missing out in the long-run due to their inability to partake in life's frivolities (Haws and Poynor, 2008; Kivetz and Keinan, 2006). Conversely, when individuals indulge, they tend to experience intense feelings of guilt, which the authors posit tend to decay faster than hyperopic individuals' feelings of having missed out (Kivetz and Keinan, 2006). They tested their hypothesis across three studies. For instance, in the first study, participants were randomly assigned to a work or pleasure condition, in which they had to describe a situation where they chose work over pleasure or vice-versa. The authors also manipulated temporal perspective by instructing participants to recall an event that occurred either in the previous week or at least 5 years ago. All participants reported their current feelings of regret associated with their choice. Participants in the "decision to work" condition indicated the extent to which they felt like they

had missed out, while participants in the "decision to indulge" condition reported how their past choice influenced their feelings of guilt. Overall, the results suggested that when participants chose virtue over vice, they experienced more regret when the focal event occurred in the past week versus five years ago. Conversely, in the vice over virtue condition, feelings of missing out were stronger in the temporally-distant condition than in the temporally-near condition. In the "decision to work" condition, guilt mediated the effect of the temporal perspective on the intensity of feeling and, conversely, in the "decision to indulge" condition, feelings of missing out mediated the impact of temporal perspective on the intensity of feeling. The authors further replicated their findings in a subsequent study using students recruited one week after winter break, as well as alumni who graduated from university 40 years prior to the study taking place. Through manipulating temporal perspective in this way, participants were asked to reflect on their past winter break, and to report their level of regret, guilt, and feelings of having missed out. Overall, the authors found that students who considered their past winter break reported higher emotions of guilt rather than missing out whereas this effect is reversed for alumni, who reported stronger feelings of missing out than guilt.

One of the ways in which consumers can remedy their hyperopic tendencies is through precommitment to indulgence. While not specifically studying hyperopia, Kivetz and Simonson (2002a) were interested in uncovering how individuals overcome their tendencies to be responsible and indulge in the small joys that life has to offer. For example, in one of their lottery studies, the authors found that participants were more likely to pick a luxury prize (e.g., massage) over a cash prize of greater financial value than to pick a utilitarian prize (e.g., credit toward grocery bills) over a cash prize also of greater value. This finding supports the authors' hypothesis, which rests on the assumption that as consumers tend to recognize their stringent behavior, they select and earmark the luxury reward for hedonic use, thus effectively precommitting to indulgence as an attempt to control for their tendency to always do the right thing. In subsequent studies, the authors also found that when participants visualize how they will use the prize, most participants report that they would spend their cash winnings on necessities, therefore swaying them to select the hedonic option. Altogether, these findings suggest that individuals are aware of their inability to indulge, and support the argument that, when given the choice, individuals will precommit to indulgence to circumvent their inclinations.

Another way in which consumers can remedy their hyperopic tendencies is through manipulating the level at which the indulgence is construed. Building on Construal Level Theory, Kivetz and Simonson's (2002a) further argue that an indulgence framed in abstract terms is more easily adopted by hyperopic consumers, much like individuals who are low in self-control, through decreasing the perceived difficulty of the indulgence goal. In two studies, the authors investigated the potential intervening mechanism of construal level in aiding hyperopic consumers to indulge. For instance, in Study 2, participants were presented with an indulgence goal (i.e., worrying less about your budget and enjoying life more) and then asked to describe either how (concrete) or why (abstract) they would pursue this goal. Overall, the authors found that for individuals low in hyperopia, construal level was not a significant predictor of "ease of indulgence." However, for highly hyperopic consumers, individuals exposed to the abstract manipulation (i.e., why one would want to achieve the goal) reported higher perceptions of ease of indulgence than those in the concrete condition (i.e., how to achieve the goal), thus suggesting that abstract thinking is beneficial for highly hyperopic individuals, but not for their non-hyperopic counterparts. The authors were also able to replicate and generalize their findings in a follow-up study utilizing advertisements for a BMW as construal-level manipulations to frame the product as an investment or not.

Further building on the construal level approach to remedying hyperopia, Mehta et al. (2014) set out to identify the specific conditions under which construal level can either hinder or facilitate indulgence. Specifically, the authors posit that the degree to which the self is either proximal or distal would also impact the effectiveness of abstract thinking on indulgence. For example, an individual whose self is at the center of their thinking should be able to recognize their own hyperopic tendencies, and thus respond positively to an indulgence framed in abstract terms. Conversely, an individual whose self is distal to their self-concept would not engage in such introspective thinking, and would thus fail to indulge when exposed to an abstract appeal, as a global mindset would remind them of societal norms prescribing abstinence over indulgence. For instance, in Study 1, the authors manipulated self-focus (present vs. control) and construal level (high vs. low) to evaluate their impact on degree of indulgence. Self-focus was manipulated through the use a mirror facing participants in the present condition; the mirror was absent in the control group. They also manipulated construal level by asking individuals either "how" or "why" they would engage in specific activities. In their study, indulgence was

measured with a behavioral dependent variable: M&Ms consumption. Each participant was given a bowl of 50 M&Ms and were told they could sample them at their own convenience while taking the study. At the end of the study, the number of M&Ms eaten was measured and used as a proxy for indulgence. Overall, they found that participants in the self-focus and high construal level condition ate significantly more M&Ms than those in the low construal level condition, with the effect being reversed in the control group. The same effect was also replicated in Study 2 when participants were asked about their intention to attend a hypothetical party or not, such that individuals in the self-focus and high construal level condition exhibited higher attendance intentions. In subsequent studies, the authors also found that participants in the self-focus and high construal level condition indicated higher willingness-to-pay (WTP) scores for hedonic products than those in the low construal group. The effect was reversed for participants in the control condition. They also found that when self-focus was present, regret, as measured by response time to anagram tasks associated with either regret (e.g., remorse, mistake) or neutral (e.g., porch, truck) words, fully mediated the impact of the construal level on indulgence as these participants answered the regret-related anagrams faster. These findings were replicated in a follow-up study using both hedonic and utilitarian products, showing the same effect as in the previous study for hedonic products, but no effect of self-focus on utilitarian items. Thus, the authors suggest that even though "self-focused individuals" primed with high construal level experienced regret associated with their hyperopic behavior, their natural inclinations were undermined only when the target product was hedonic.

An additional way in which consumers can remedy their hyperopic tendencies is through providing them with a valid reason to "let loose." Prior research on justification in the context of indulgence reveals that individuals are more likely to indulge when they feel like they deserve to do so. For example, Kivetz and Simonson, (2002b) hypothesized that, in the context of frequency programs, consumers' preference for a luxury rather than a necessity reward would be positively related to the level of difficulty inherent to attaining the reward. Across four studies, the author found support for their initial prediction, but also uncovered that the effect of program requirements, used as a proxy for effort, on propensity to select a luxury over a necessity was stronger for individuals who are naturally inclined to feel guilty. Okada (2005) further investigated this research question and claimed that individuals have a preference for hedonic options over utilitarian ones when each one is presented on its own; however, when both are

presented at the same time, Okada posited and found support for her hypothesis that consumers favor the utilitarian option because it is more easily justifiable. Specifically, participants' purchase intentions were assessed by presenting them with various consumer goods (i.e., Sony Diskman, a personal digital assistant, a university sweatshirt, a Casio scientific calculator, and a Webster's dictionary) and were asked to disclose their perceptions of product type (hedonic versus utilitarian) for each. In two separate sessions, students also reported their WTP for each product, both in money and in time (i.e., how much time participants would be willing to work to acquire the product). Interestingly, the author found that participants were more readily inclined to pay for hedonic goods with time and for utilitarian items with money, which reinforces Kivetz and Simonson's (2002b) findings that consumers are more likely to purchase a hedonic product when they feel they have earned it directly.

Kivetz and Zheng (2006) specifically investigated how hyperopic individuals give themselves license to indulge. The authors claim that hyperopic individuals' tendency to avoid pleasurable events might result from a propensity to abide by the laws of reason. The authors also identified two potential routes in which justification operates: overcoming guilt and justifying self-gratification, where the former focuses on getting rid of feelings of guilt through effort and the latter on indulging without depleting income, or money. Overall, the authors posited that when consumers are unable to justify an indulgence, they will act in a hyperopic manner, thus foregoing any gratification and preferring "virtue over vice." Across several studies, the authors found support for their prediction that higher effort lead consumers to pick vice instead of virtue. Additionally, and more central to this thesis' objective, the authors evaluated how each route would impact participants' WTP for vice and virtue. In a study conducted with 229 travelers at a train station, the authors operationalized a "virtue" product as a "certificate for four haircuts" and a "vice" product as a "luxurious one-hour pampering Swedish or sports massage at any luxury spa." In the effort condition, participants also reported how many surveys they would be willing to take to get the reward and in the money condition, they reported how much they would be willing to pay for the reward, in dollars. All participants also indicated their natural propensity to experience guilt when thinking about engaging in a hedonic activity. Even though the authors' results did not reach statistical significance, their findings were directionally sound. Specifically, participants in the effort (money) condition were willing to complete more surveys (pay less money) to earn the "spa reward" than those who desired the

"free haircut coupons." This effect, however, was only valid for chronically guilt-ridden individuals.

Going back to the opening example where a hyperopic consumer was considering getting a seasonal entrée, she should be more likely to order the decadent option if she were able to justify the indulgence and/or if she anticipated regretting not choosing that option. Therefore, if the dish is offered only for a limited time, and thus not going to be available again at least in the near future, the scarcity appeal may be able to convince the hyperopic consumer to indulge in the luxurious dish by fear of missing out on this opportunity and/or by providing a reason to do so.

**Scarcity Promotions Prompt Consumers to Indulge**

One way in which consumers' perceptions of a product's availability can be manipulated is through scarcity appeals (Cialdini, 2009) by, for example, limiting the purchase quantity of a product offered at a steep discount. Scarcity appeals have been shown to increase consumers' valuation of products (Lynn, 1991), resulting in more positive attitudes (Lynn, 1991, Inman et al., 1997), higher willingness-to-pay (Worchel et al., 1975; Verhallen, 1982; Verhallen and Robben, 1994), and higher purchase intentions (Inman et al., 1997; Aggarwal et al., 2011).

Prior work on scarcity appeals investigated the scope and boundaries of the effect, such as the type of scarcity appeals and products, and the source of the scarcity. For instance, Aggarwal et al. (2011) have demonstrated that restricting a promotional offer increases its effectiveness, and further showed that limited-quantity scarcity (LQS) promotions lead to higher purchase intentions as compared to limited-time scarcity (LTS) offers, due to LQS promotions prompting consumers to compete among themselves to benefit from the promotion before it runs out. The authors further investigated whether the nature of the messaging (i.e., functional vs. symbolic) impacted the effectiveness of the scarcity appeal. They found that the effect of a LQS promotion on purchase intentions was greater when paired with a symbolic message (i.e., "Express your creativity and personality") as opposed to a functional message (i.e., "A practical and durable solution for every user"; Aggarwal et al., 2011). Scarcity appeals have also been shown to significantly increase purchase intentions for hedonic products when the restricted availability stems from supply-related scarcity rather than demand-related scarcity (Ku et al., 2013, Worchel et al., 1975). Specifically, Ku et al. (2013) used a 3 (scarcity: demand-generated, supply-generated, control) by 2 (product type: utilitarian, hedonic) between-subject design to

evaluate the impact of the two factors on purchase intentions for various utilitarian and hedonic products. Taking two of the products as examples, where sunscreen is characterized as an utilitarian product and chocolate as a hedonic product, the authors found that when participants ascribed scarcity as supply-related, purchase intentions for the chocolate were highest, and lowest for the demand-related scarcity; the effect was reversed for the sunscreen. Supply-related scarcity are thus most effective in increasing purchase intentions when targeted at hedonic products rather than utilitarian ones.

Given hyperopic consumers' strong resistance to indulgences, scarcity appeals geared toward luxuries may prove less effective with these consumers, especially if they feel like they don't deserve to indulge. Conversely, given the limited nature of scarcity appeals, they might instead exacerbate hyperopic consumers' feelings of anticipated regret, while also providing a justification for the indulgence. Should this be the case, hyperopic consumers may be able to overcome their aversion to indulgence, thus providing another condition under which they may be encouraged to yield to temptation. Moreover, given the demonstrated prevalence of the effect of scarcity appeals, one may also wonder whether there are any conditions under which these appeals may prove less effective. I believe that investigating hyperopia provides a good research context to evaluate the allure of scarcity appeals when it comes to luxuries.

**Overview of Studies**

Across six studies, I investigated i) whether contextual cues can prompt consumers to become hyperopic (studies 1-3) and ii) whether scarcity appeals can overcome hyperopic consumers' aversion to indulgence (studies 4-6). Study 1 first explored the validity of a hyperopia manipulation against related constructs. Study 2 then tested whether the hyperopia manipulation produced behavior similar to trait-hyperopia and investigated the role of justification in the effect. Next, Studies 4 and 5 explored the effect of limited-time (Study 4) and limited-quantity (Study 5) scarcity appeals on trait-hyperopic consumers' purchase intentions (Study 5) and actual consumption (Study 4) of an indulgence. Finally, Study 6 replicated and extended the findings of Studies 4 and 5 using a hyperopia manipulation. Studies 5 and 6 also explored alternative explanations for the effect found in Study 4.

## Study 1: Validation of a Hyperopia Manipulation

Study 1 aimed to test the validity of a hyperopia episodic recall task in inducing state-hyperopia by ensuring that it does not affect other personality traits, following a similar method used by Haws and Poynor (2008) in developing their Hyperopia scale.

### Participants

Six hundred and four participants were recruited through Amazon Mechanical Turk (MTurk). Previous research has deemed the MTurk participant pool as reliable for application in consumer research (Goodman et al., 2013). Participants were offered a nominal monetary fee for their participation in the study.

### Research Design and Procedure

First, all participants were randomly assigned to either a state-hyperopia or control condition. In the state-hyperopia condition, respondents were presented with an episodic recall task, adapted from Fischhoff et al. (2003), in which they were asked to list three or four times when they prevented themselves from indulging or from doing something indulgent because they felt it was not the right thing to do. Subsequently, participants were told to elaborate on two of these times. Specifically, they were asked why they felt like they should not indulge in a luxury. In the control condition, participants were instructed to list three or four things that they did in the past week, and then to elaborate on two of these things by indicating why they thought these events were memorable.

Following the episodic recall task, participants were asked to complete an Instructional Manipulation Check (IMC) adapted from Oppenheimer et al. (2009). The task was titled "Sports Participation" and participants read a short text on decision-making, in which was included an instruction to select "curling" in the multiple-choice answers listed underneath. At the top of the choice options, the question "Which of these activities do you engage in regularly?" was visible. If participants did not read the instructional text before selecting their favorite activities from the list, and thus did not select "curling", they were told on the next page that they had not completed the task correctly and were then presented with the same prompt a second time.

Next, participants were randomly assigned to one of four sets of dependant measures. Approximately one fourth of all respondents answered the 8-item Frugality scale (Lastovicka et al., 1999). Items include "If you take good care of your possessions, you will definitely save money in the long run", "Making better use of my resources makes me feel good", and "There are things I resist buying today so I can save for tomorrow" (1 = "Strongly disagree", 6 = "Strongly agree"). Following a preliminary analysis of the data, 49 participants were removed from the dataset due to issues pertaining to lack of attention or incompletion of the experimental treatment (final $N$ = 102, 56.9% female; $M_{Age}$ = 39.52, $SD$ = 12.16; see Appendix 1 for exclusion criteria). Similar data cleaning procedures have been applied for the other three scales and are discussed in Appendix 1. A reliability analysis conducted on the Frugality scale using the resulting sub-sample returned a Cronbach's value of 0.85, thus indicating that the measure was reliable. As such, aggregate Frugality scores, out of a total of 48, were subsequently calculated for each participant ($M_{Frugality}$ = 40.58, $SD$ = 5.53).

Another fourth of all participants were asked to complete the 4-item Tightwad-Spendthrift (TWST) scale (Rick et al., 2008). First, participants were asked to self-report their own spending level (1 = "Tightwad – difficulty spending money, 11 = "Spendthrift – difficulty controlling spending). Participants were then presented with two descriptions of how different types of people struggle to either limit their spending or spend their money. Following the short text, participants were asked to indicate to which extent each description fits them, on 5-point Likert scales. Next, participants were instructed to read a short story about two shoppers, Mr. A and Mr. B; Mr. A is a spendthrift and Mr. B is a tightwad. After reading the text, participants had to indicate to which extent their own behavior resembles that of Mr. A or Mr. B (1 = "Mr A.", 5 = "Mr. B"). All reverse-coded items were recoded following the scale's instructions to ensure consistency across all scale items. A reliability analysis conducted on the TWST scale using the cleaned sub-sample (final $N$ = 88, 54.5% female; $M_{Age}$ = 39.30, $SD$ = 11.78; see Appendix 1 for exclusion criteria) returned a Cronbach's alpha value of 0.80, thus indicating that the scale is reliable. As such, aggregate TWST scores, out of a total of 26, were subsequently calculated for each participant ($M_{TWST}$ = 12.56, $SD$ = 4.94).

One fourth of all participants were exposed to the 13-item Brief Self-Control (BSC) scale (Tangney and Baumeister, 2004). The BSC includes items such as "I am good a resisting

temptation", "I wish I had more self-discipline", and "I am able to work effectively toward long-term goals" (1 = "Not at all", 5 = "Very much"). After recoding all reverse-coded items as per the scale's instructions, a reliability analysis conducted on the BSC scale using the cleaned sub-sample (final $N$ = 92, 63% female; $M_{Age}$ = 38.01, $SD$ = 11.53; see Appendix 1 for exclusion criteria) returned a Cronbach's alpha value of 0.89, thus indicating that the scale is reliable. As such, aggregate BSC scores, out of a total of 65, were subsequently calculated for each participant ($M_{BSC}$ = 44.83, $SD$ = 9.71).

Finally, the remaining quarter of all respondents was asked to complete the 6-item Hyperopia scale (Haws and Poynor, 2008), which includes statements such as "I often fail to enjoy attractive opportunities" and "I rarely enjoy the luxuries life has to offer." For each item, participants indicated their level of agreement (1 = "Strongly disagree", 7 = "Strongly agree"; see Appendix 2 for all scale items). The Hyperopia scale is meant to measure one's hyperopic tendencies as a personality trait irrespective of one's level of self-control (Haws and Poynor, 2008). A reliability analysis conducted on the Hyperopia scale using the cleaned sub-sample (final $N$ = 92, 58.7% female; $M_{Age}$ = 38.10, $SD$ = 11.05; see Appendix 1 for exclusion criteria) returned a Cronbach's alpha value of 0.9, thus indicating that the scale is reliable. As such, aggregate Hyperopia scores, out of a total of 42, were subsequently calculated for each participant ($M_{Hyperopia}$ = 24.24, $SD$ = 8.9).

After answering their assigned scale, participants completed standard demographic questions. All study materials can be found in Appendix 2.

**Results and Discussion**

Based on Haws and Poynor's (2008) work, I expected to find no differences between the state-hyperopia and control groups on Frugality, Tightwad/Spendthrift, Self-Control measures, but expected the manipulation to have an effect on the Trait-Hyperopia measure as discussed by Fleeson (2007) since personality states and traits should share similar contents.

*Frugality.* A one-way ANOVA on the frugality scores using state-hyperopia as the predictor revealed no significant difference in the frugality scores between the hyperopia and control conditions ($M_{Hyperopia}$ = 40.84 , $SD$ = 5.30; $M_{Control}$ = 40.43, $SD$ = 5.69; $F(1, 100)$ = 0.18, $p$

= 0.72), suggesting that the state-hyperopia episodic recall task did not impact participants' levels of frugality.

*Tightwad-Spendthrift.* A one-way ANOVA on the aggregate TWST scores using state-hyperopia as the predictor revealed no significant difference in the TWST scores across the hyperopia and control conditions ($M_{Hyperopia}$ = 12.06, $SD$ = 4.67; $M_{Control}$ = 12.9, $SD$ = 5.14; $F(1, 86)$ = 0.62, $p$ = 0.43), suggesting that the state-hyperopia manipulation did not impact participants' levels of TWST.

*Self-Control.* A one-way ANOVA on the aggregate BSC scores using state-hyperopia as the predictor revealed no significant difference in the BSC scores across the hyperopia and control conditions ($M_{Hyperopia}$ = 46.13, $SD$ = 8.81; $M_{Control}$ = 43.41, $SD$ = 10.52, $F(1, 90)$ = 1.81, $p$ = 0.18), suggesting that the state-hyperopia episodic recall task did not impact participants' levels of self-control.

*Trait Hyperopia.* A one-way ANOVA on the aggregate trait-hyperopia scores using state-hyperopia as the predictor revealed no significant difference in the hyperopia scores across the hyperopia and control conditions ($M_{Hyperopia}$ = 26.56, $SD$ = 7.91; $M_{Control}$ = 23.28, $SD$ = 9.17; $F(1, 90)$ = 2.63, $p$ = 0.11), suggesting that the state-hyperopia manipulation did not impact participants' levels of trait-hyperopia.

Taken together, the above results indicate that the state-hyperopia manipulation did not impact frugality, self-control, spendthrift-tightwad, and trait-hyperopia. However, the difference in means between the two experimental groups for the hyperopia scale was close to being marginally significant ($p$ = 0.11), and participants in the state-hyperopia condition directionally exhibited higher trait-hyperopia scores than those in the control condition, which suggest that the state-hyperopia prime may impact one's hyperopic disposition, but that greater statistical power may be needed to demonstrate the effect.

**Study 2: The Effect of Contextual Cues on Consumers' Hyperopic Tendencies**

The purpose of Study 2 was to investigate the effect of the state-hyperopia manipulation on individuals' propensity to indulge. In this study, indulgence was measured using a product preference scale, where participants had to pick between an indulgent option (i.e., a gift card for

a fancy dinner) and a more utilitarian option (i.e. a gift card for groceries; adapted from Kivetz and Simonson, 2002a).

**Participants**

One hundred and five undergraduate students participated in this laboratory study for course credit. Based on a preliminary evaluation of the collected data, 33 participants were excluded from the dataset due to issues pertaining to lack of attention or incompletion of the experimental treatment (final $N = 72$, 50% female; $M_{Age} = 21.25$, $SD = 2.87$; see Appendix 1 for exclusion criteria).

**Research Design and Procedure**

Participants were first exposed to the same sports participation attention check as in Study 1. Next, participants were randomly assigned to either a state-hyperopia or a control episodic recall task, as in Study 1. Following the experimental treatment, participants answered the 16-item Brief Mood Introspection scale (BMIS; Mayer and Gaschke, 1988). The BMIS measures current mood and was included in this study to ensure that the primed hyperopia manipulation did not induce a change in mood, thus potentially ruling out its confounding effect. Specifically, participants were presented with eight positive and eight negative adjectives, and were instructed to indicate how well each statement described their present mood (1 = "Definitely do not feel", 4 = "Definitely feel"). Examples of adjectives include "Lively", "Happy", "Sad", and "Tired" (see Appendix 3 for all materials). As instructed by Mayer and Gaschke (1988), the eight negative adjectives part of the BMIS were reverse-coded. A reliability analysis on the 16-item BMIS yielded a Cronbach's alpha of 0.79, thus suggesting that the scale is reliable. As such, I calculated aggregate BMIS scores, out of a total of 64, for each participant ($M_{BMIS} = 44.42$, $SD = 6.22$), per the authors' instructions (Mayer and Gaschke, 1988).

Next, participants were presented with a choice task adapted from Kivetz and Simonson (2002a). Using a 7-point Likert scale, respondents were told to imagine that, as part of the study, they would be entered in a draw to win a $100 gift card, and to select their preferred option. At the extreme left of the scale, a picture of a gift card for groceries was displayed, and a picture of a gift card for a fancy dinner was shown at the extreme right of the scale (see Appendix 3). Finally, participants were presented with the 6-item Hyperopia scale (Haws and Poynor, 2008)

and completed standard demographic questions. The trait-hyperopia scale was shown to be adequately reliable ($\alpha = 0.77$), and I aggregated the six trait-hyperopia items to calculate trait-hyperopia scores for each respondent ($M_{Trait\text{-}hyperopia} = 18.61$, $SD = 6.8$).

**Results and Discussion**

First, to test if the hyperopia episodic recall task induced a change in mood, I conducted a one-way ANOVA on the BMIS scores using state-hyperopia as the predictor. The ANOVA showed that the mean BMIS scores for the two groups were not significantly different ($M_{State\text{-}hyperopia} = 44.49$, $SD = 6.83$; $M_{Control} = 44.34$, $SD = 5.59$, $F(1, 70) = 0.09$, $p > 0.92$), thus indicating that the state-hyperopia episodic recall task did not impact participants' mood.

Next, I conducted an ANOVA on gift card preferences using state-hyperopia as the focal predictor. The ANOVA revealed that participants who were primed with hyperopia ($M_{State\text{-}hyperopia} = 3.32$, $SD = 2.6$) were marginally more likely to select the groceries (vs. fancy restaurant) gift card than those in the control condition ($M_{Control} = 4.43$, $SD = 2.6$, $F(1,70) = 3.23$, $p = 0.08$).

Then, to investigate if the state-hyperopia manipulation impacted trait-hyperopia, I conducted another ANOVA using the state-hyperopia as the focal predictor. There were no differences between the trait-hyperopia means, indicating that the manipulation did not impact participants' level of trait-hyperopia ($M_{Control} = 18.60$, $SD = 7.30$; $M_{State\text{-}hyperopia} = 18.62$, $SD = 6.37$, $p = 0.99$). To further validate the state-hyperopia manipulation, PROCESS (Hayes, 2013) was used to investigate if individuals primed with state-hyperopia behaved similarly across levels of trait-hyperopia. The trait-hyperopia variable was mean-centered prior to analysis but, for ease of interpretation, raw values are reported in this section (see Appendix 3 for output with mean-centered values). With state-hyperopia as the independent variable, the gift card choice as the dependent variable, and the aggregate trait-hyperopia scores as the moderator, the analysis revealed that trait-hyperopia had a significant effect on gift card choice ($\beta = -0.10$, SE $= 0.05$, t $= -2.35$, p $= 0.02$). Additionally, the state-hyperopia manipulation predictor was marginally significant ($\beta = -1.10$, SE $= 0.59$, t $= -1.88$, p $= 0.06$), and the interaction between the two hyperopia variables was significant ($\beta = -0.18$, SE $= 0.09$, t $= -2.11$, p $= 0.04$).

**Figure 1: Interaction Between State- and Trait-Hyperopia on Gift Card Preferences**
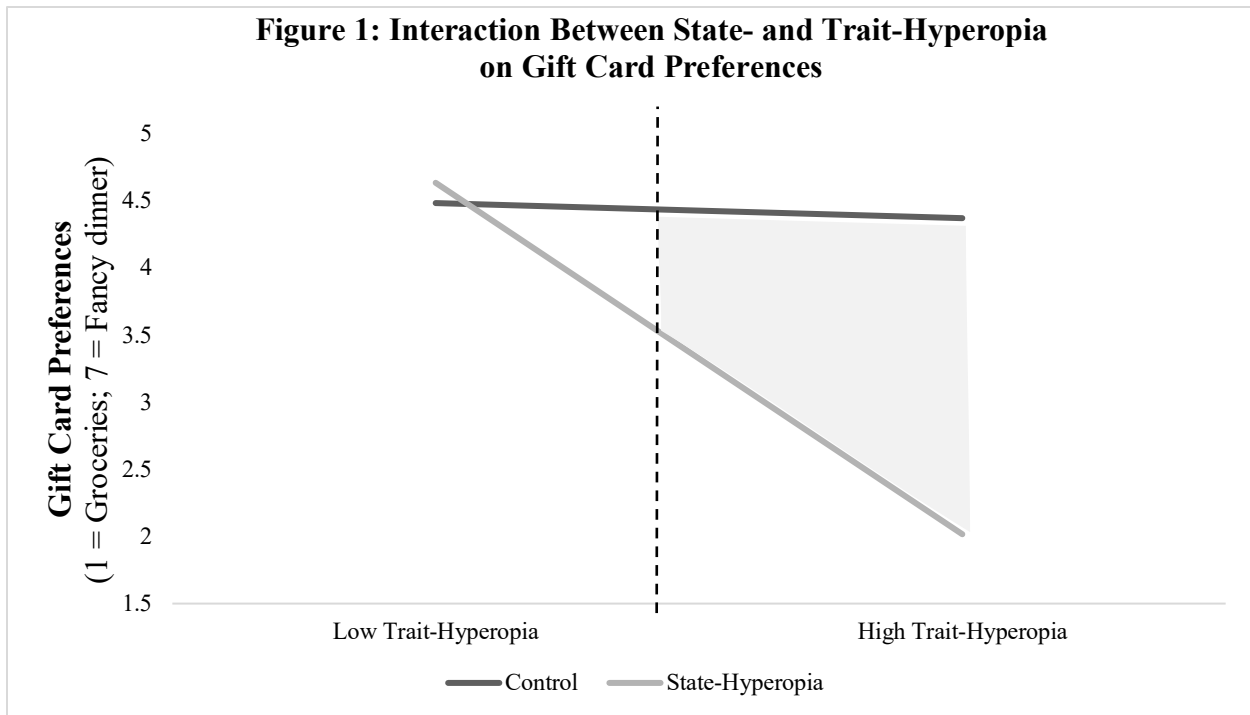
To further explore this interaction, I conducted a Johnson-Newman analysis. At a trait-hyperopia value of 19, the conditional effect of the state-hyperopia manipulation on the choice of gift card turns from non-significant to significant, with 44.4% of the sample comprised in the significance region. Further, at one standard deviation above the trait-hyperopia mean, the effect is highly significant ($\beta_{Conditional}$ = -2.36, $SE$ = 0.83, $t$ = -2.82, $p < 0.01$).

The above results suggest that the state-hyperopia manipulation successfully induced individuals to behave in a more responsible, conservative manner when operationalized as picking a gift card with utilitarian benefits rather than hedonic ones. This result conflicts with prior research showing that when individuals are presented with an indulgent and utilitarian option, they tend to select the latter (Okada, 2005) as in this study, the choice to select the utilitarian option seems to vary as a function of one's trait-hyperopia level, but only when state-hyperopia was also salient. However, the trait-hyperopia null effect on gift card preference in the control condition could also point to an overall tendency to precommit to indulgence since the task was presented as a lottery (Kivetz and Simonson, 2002a). Indeed, when state-hyperopia is not salient, high trait-hyperopic individuals preferred the hedonic gift card over the utilitarian one, potentially as a way to precommit to indulging. It is thus interesting that the state-hyperopia

manipulation seems to have been able to override high trait-hyperopia consumers' natural tendencies.

One other possible explanation, although not directly tested in this study, could lie in participants' degree of justification. As prior work showed that indulging is easier when consumers can justify it (Kivetz and Zheng, 2006), the activation of state-hyperopia in already highly hyperopic individuals could have hindered their ability to justify picking the fancy dinner gift card, thus swaying them toward the groceries one. Moreover, since no significant differences in means were found across the primed state-hyperopia and control conditions in terms of mood, it appears this effect is not due to an affective change.

### Study 3: The Moderating Effect of Regret on Hyperopic Consumers' Preferences

The goals of Study 3 were threefold: i) directly replicate the findings of Study 2 to ensure the effectiveness of the manipulation, ii) investigate the role of regret, and iii) explore the role of justification in the effect of hyperopia on preferences, given the results of Study 2. Prior work showed that hyperopic consumers become less averse to indulgences when they anticipate regretting not having indulged (Keinan and Kivetz, 2008), therefore if our manipulation worked, then priming regret in addition to state-hyperopia should increase hyperopic participants' preferences for the more indulgent gift card by directly impacting justification.

### Participants

Six hundred and three participants were recruited through MTurk and were offered a nominal monetary fee for their participation in the study. A preliminary evaluation of the dataset led to the exclusion of 51 participants for issues pertaining to lack of attention or incompletion of the experimental treatment (final $N = 552$, 57.9% female, $M_{Age} = 38.85$, $SD = 11.85$; see Appendix 1 for exclusion criteria).

### Research Design and Procedure

This study used a 2 (state-hyperopia: primed vs. control) X 2 (regret: primed vs. control) between-subject factorial design. Participants were randomly assigned to either a state-hyperopia or a control episodic recall task, similar to the one used in previous studies. The state-hyperopia/control$_{regret}$ and control$_{state\text{-}hyperopia}$/control$_{regret}$ conditions employed the same

manipulations as in Studies 1 and 2. In the control$_{state-hyperopia}$/regret condition, participants were instructed to list three to four things that they regretted not having done in the past week, and then to elaborate on two of these activities. In the state-hyperopia/regret condition, participants were asked to list three to four times when they prevented themselves from indulging and regretted it afterward (see Appendix 4 for all materials).

Next, participants were shown the same choice task as in Study 2, where they were instructed to pick between a $100 groceries gift card or a $100 gift card for a fancy restaurant dinner, using a 7-point Likert scale. Participants were then asked to indicate how justifiable their choice of gift card was (1 = "Not at all justifiable", 10 = "Extremely justifiable), how easy it was for them to defend their choice (1 = "Not easy to defend at all", 10 = "Very easy to defend"), and how logical their choice was (1 = "Very illogical", 10 = "Very logical"), as adapted from Inman and Zeelenberg (2002). Using the three justification questions as scale items, a reliability analysis returned a Cronbach's alpha of 0.88, indicating that the scale was reliable. Aggregate Justification scores, out of a total of 30, were thus computed for each participant ($M_{Justification}$ = 27.40, $SD$ = 4.44). Finally, participants answered the 6-item Hyperopia scale and completed standard demographic questions. The Cronbach's alpha value for the trait-hyperopia scale was 0.88, so respondents' aggregate Trait-Hyperopia scores were calculated following the same procedure as in previous studies ($M_{Trait-hyperopia}$ = 24.18, $SD$ = 8.5).

**Results and Discussion**

First, in order to try to replicate the interaction between state- and trait-hyperopia from Study 2, I conducted analyses on the sub-sample of participants who were not exposed to the regret manipulation (i.e., state-hyperopia/control$_{regret}$ and control$_{state-hyperopia}$/control$_{regret}$ conditions; $N$ = 286). Following the same procedure as in Study 2, I conducted the analysis using PROCESS (Hayes, 2013) on mean-centered data, but reported raw scores below for ease of interpretation (see Appendix 3 for output with mean-centered values). The overall model was marginally significant ($F(3,282)$ = 2.4, $p$ = 0.07). There was no main effect of the state-hyperopia manipulation on gift card preferences ($\beta$ = -0.32, $SE$ = 0.23, $t(282)$ = -1.44, $p$ = 0.16). Trait-hyperopia had a significant effect on participants' choice of gift card, as in Study 2 ($\beta$ = -

0.03, $SE = 0.01$, $t(282) = -2.14$, $p = 0.03$). The interaction term was however not significant ($\beta = -0.02$, $SE = 0.03$, $t(282) = -0.62$, $p = 0.53$), contrary to Study 2's findings.

**Figure 2: Interaction Between State- and Trait-Hyperopia on Gift Card Preferences**
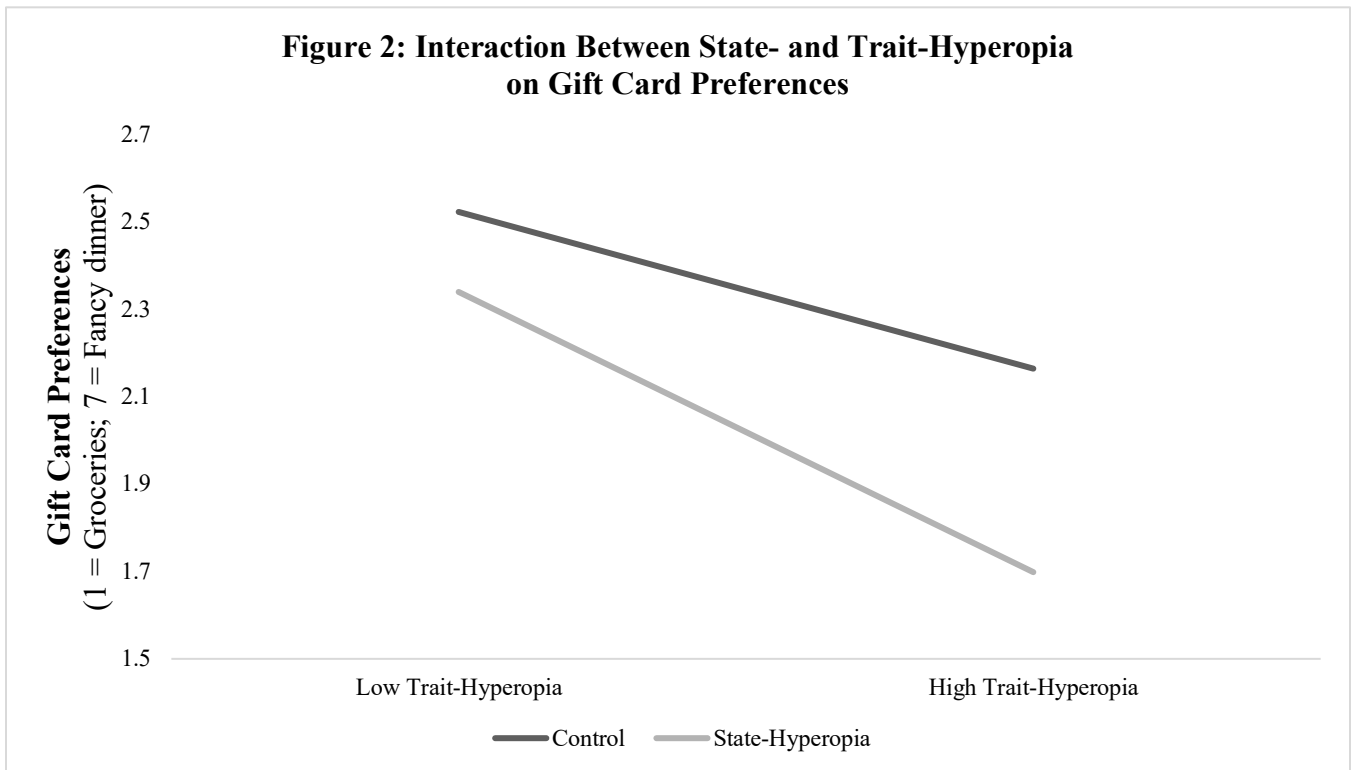


Next, to investigate the effect of regret, I used the entire cleaned sample to first conduct a 2-way ANOVA on gift card preferences using state-hyperopia (dummy coded; control = 0, state-hyperopia = 1) and regret (dummy coded; control = 0, primed = 1) as predictors. The analysis revealed no main effect of each manipulation (see Appendix 5 for full results), but the interaction between the two manipulations was significant ($F(1, 548) = 5.475$, $p = 0.02$). Pairwise comparisons revealed that the regret main effect was significant only in the state-hyperopia condition ($M_{Control-Regret} = 2.01$, $SD = 1.67$; $M_{Regret} = 2.62$, $SD = 1.90$, $F(1, 548) = 5.69$, $p = 0.02$).

**Figure 3: The Impact of State-Hyperopia and Regret on Gift Card Preferences**
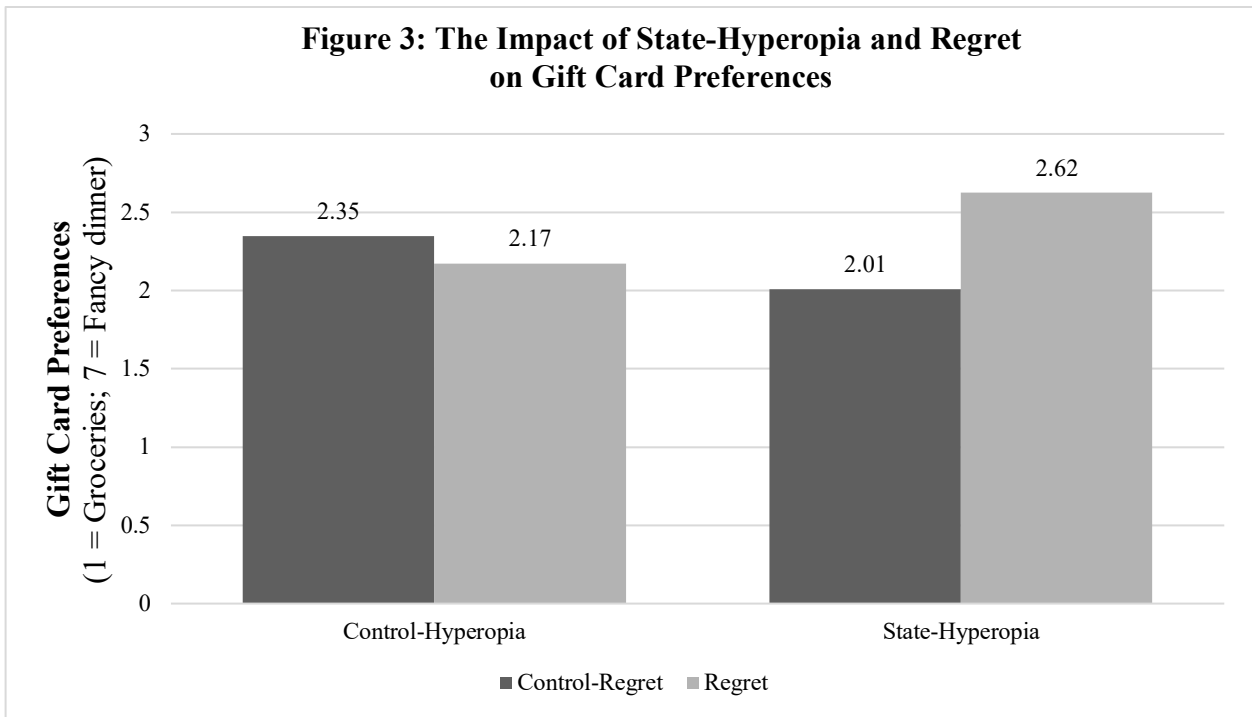
I conducted another 2-way ANOVA on the aggregate justification scores. The state-hyperopia main effect was significant ($M_{State-Hyperopia}$ = 26.97, $SD$ = 4.78, $M_{Control}$ = 27.72, $SD$ = 4.16, $F(1, 548)$ = 4.33, $p$ = 0.04), as well as the regret main effect ($M_{Regret}$ = 27.03, SD = 4.95, $M_{Control}$ = 27.75, $SD$ = 3.88, $F(1, 548)$ = 5.12, $p$ < 0.02). The interaction between hyperopia and regret was also significant ($F(1, 548)$ = 4.07, $p$ = 0.04). Pairwise comparisons revealed that in the state-hyperopia condition, participants who were also primed with regret reported lower justification scores than those in the control_regret condition ($M_{Control-Regret}$ = 27.74, $SD$ = 3.94, $M_{Regret}$ = 26.11, $SD$ = 5.46, $F(1, 548)$ = 7.87, $p$ < 0.01). This however did not occur in the state-hyperopia control condition ($M_{Control-Regret}$ = 27.76, $SD$ = 3.85, $M_{Regret}$ = 27.67, $SD$ = 4.47, $F(1, 548)$ = 0.04, $p$ = 0.85). These results suggest that individuals primed to exhibit hyperopic tendencies justify indulgence less when regret is salient.

Since the interaction between the two factors is significant for both the justification and the gift card preferences, I used model 8 in PROCESS (Hayes, 2013) to evaluate the moderated-mediation model in Figure 4, using 5,000 bootstrapped samples (see Appendix 5 for full results).

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**Figure 4: Moderated-Mediation Model (PROCESS Model 8)**
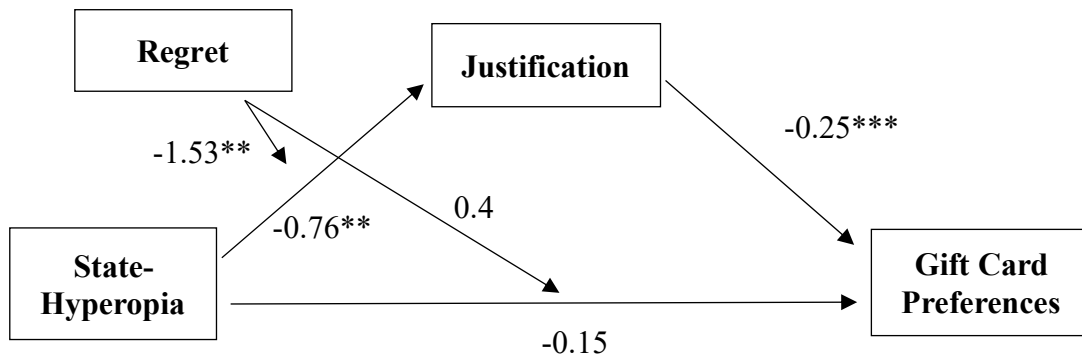


Note: *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

As shown in Figure 4, the moderated-mediation was not significant ($\beta_{Conditional} = 0.39$, *SE* = 0.21, 95% Bootstrap CI: [-0.01, 0.8]). Since the coefficient of the interaction between regret and state-hyperopia on justification is negative, individuals reminded of missed indulgence opportunities that they regret exhibit a lesser propensity to justify. Further, the more one justifies indulging, the more they tend to select the responsible (i.e., groceries gift card) choice, since the coefficient between justification and gift card preferences is also negative. The conditional effect of state-hyperopia, when participants were also primed with regret, on gift card preferences was significantly mediated by justification ($\beta_{Conditional} = 0.4$, *SE* = 0.17, 95% Bootstrap CI: [0.08, 0.75]).

Prior research has shown that hyperopic consumers can be swayed to indulge when potential regret is also salient (Keinan and Kivetz, 2008), as mentioned previously. However, I did not find support for this prediction in this study. I also expected that lower degrees of justification would lead to preferences for the hedonic gift card over the utilitarian one. Contrary to my hypothesis, it seems that as one's degree of justification increases, preferences move toward the grocery gift cards rather than the fancy dinner one. These unexpected results could be attributed to sample characteristics, as this study was conducted on MTurk. Indeed, previous research using the MTurk participant pool found that these individuals tend to report lower income in comparison to the normal U.S. workforce (Paolacci et al., 2010). Given that low-income groups might perceive more products as luxuries rather than necessities (Haws and

Poynor, 2008), Turkers might have been unable to relate to the fancy dinner as anything other than a luxury, and thus preferred the more sensible option (i.e., the gift card for groceries).

Regarding the justification measure, because respondents were not justifying the same choice (i.e., participants justified their choice of gift card irrespective of what gift card they had selected), the results were confounded. Possible solutions could be to treat gift card preferences as an independent variable to explore how they impacted justification scores, or to split the sample based on participants' gift card preferences (i.e., participants who preferred the groceries gift card vs. fancy dinner gift card) and run the model illustrated in Figure 4 on each sample.

Overall, studies 1-3 investigated whether contextual cues can prompt consumers to become hyperopic and found mixed evidence. Next, studies 4-6 will investigate whether scarcity appeals can overcome hyperopic consumers' aversion to indulgence.

## Study 4: The Effect of Scarcity Appeals on Trait-Hyperopic Consumers' Behavior

The aim of Study 4 was to investigate the effect of a limited-time scarcity appeal on hyperopic consumers' behavior. Following my theoretical framework, I expected that hyperopic consumers would indulge more when presented with a scarcity (vs. control) appeal.

### Participants

Ninety-seven undergraduate students participated in this study for a course credit. Thirty participants were excluded from the analysis due to dietary restrictions, language barriers, and a lack of attention, resulting in a final sample of 66 participants (59.1% female, $M_{Age} = 21.23$, $SD = 3.68$). The same exclusion criteria were used for studies conducted with similar populations (i.e., undergraduate students vs. online panel; see Appendix 1 for exclusion criteria).

### Research Design and Procedure

First, all participants completed the same Sports Participation IMC task as in previous studies (see Appendix 2 for materials) and were asked to complete the 6-item Hyperopia scale (Haws and Poynor, 2008). A reliability analysis of the trait-hyperopia scale revealed a Cronbach's alpha of 0.82, which is well above the accepted cut-off of 0.70 (Nunnally, 1967). Participants' responses to the hyperopia scale were thus summed up to create a hyperopia score, out of a total of 42, for each participant ($M_{Hyperopia} = 20.03$, $SD = 7.23$).

To ensure that the exclusion criteria used in this study did not interfere with the random assignment process, a one-way ANOVA was conducted on the hyperopia scores between the two scarcity conditions. If the principle of random assignment was unhindered by the exclusion criteria, there should be no significant difference in the mean scores between the two groups. Accordingly, the one-way ANOVA did not reveal a significant difference between the aggregate hyperopia scores between the LTS ($M_{LTS}$ = 19.37, $SD$ = 6.47) and the control groups ($M_{Control}$ = 20.93, $SD$ = 8.18, $F(1, 64)$ = 0.748, $p$ = 0.39), thus suggesting that random assignment worked successfully.

Next, participants were randomly assigned to either a scarcity offer or a control condition. The scarcity manipulation was operationalized as a limited-time scarcity (LTS) opportunity to sample Hershey's Hugs candies, which are a combination of Hershey's milk chocolate and white cream. Participants in the scarcity condition were told that the study presented them with a "unique opportunity, today only" to sample Hershey's Hugs in the laboratory. In the control condition, participants were also offered the opportunity to sample Hershey's Hugs, but were not presented with a limited-time offer (see Appendix 6 for all materials).

Participants were then asked if they could eat the chocolate candies or not. Participants who were not able to eat the chocolates were disqualified from the remainder of the study. Participants who indicated that they could eat the chocolates were prompted to pick how many Hershey's Hugs they wanted to sample (from 0-6 candies), at which point the research assistant brought them the requested amount. Participants were then instructed to sample the chocolates at their convenience while answering filler questions unrelated to this study, after which they were asked to indicate their evaluation of the taste and enjoyment of the experience (1 = "Not at all, 7 = "Very much"). Previous experience with Hershey's Hugs (categorical variables; "Yes", "No", "Maybe") and the extent to which participants like Hershey's Kisses in particular and chocolate in general (1 = "Not at all", 5 = "Very much") were also measured as potential covariates. Moreover, participants were asked to report to what extent they watch what they eat (1 = "Not at all, 6 = "Very much"), if they are currently on a diet (1 = "Not at all, 6 = "Very much"), as well as how long ago they last ate, in hours, on a slider scale with 0 and 10 as the extreme anchor points. Finally, participants completed standard demographic questions. After each participant

left the lab, the research assistant assessed and recorded the number of Hershey's Hugs eaten by each participant.

**Results and Discussion**

A one-way ANOVA on the number of chocolates demanded and using scarcity as the predictor revealed a marginal difference between the LTS ($M_{LTS}$ = 2.84, $SD$ = 1.62) and control conditions ($M_{Control}$ = 2.18, $SD$ = 1.36, $F(1, 64)$ = 3.09, $p$ = 0.08). The same analysis was also conducted on the number of chocolates eaten, which revealed a similar pattern ($M_{LTS}$ = 2.71, $SD$ = 1.66; $M_{Control}$ = 2.07, $SD$ = 1.22, $F(1, 64)$ = 2.98, $p$ = 0.09). Directionally, participants in the LTS condition demanded and ate more chocolates than those in the control condition.

Next, PROCESS (Model 1; Hayes, 2013) was used to test for the interaction between the scarcity appeal (vs. control) and trait-hyperopia scores on the number of chocolates eaten. As in previous studies, raw scores are presented below, but the analyses were conducted on mean-centered values (see Appendix 7 for mean-centered output). Neither the model with the interaction nor any of its coefficients were significant ($F(3,62)$ = 1.48, $p$ = 0.23). However, I observed a marginal main effect of scarcity in line with the ANOVA results ($\beta_{Scarcity}$ = 0.64, $SE$ = 0.37, $t$ = 1.72, $p$ = 0.09; see Appendix 7 for full results). Further, as hyperopia is a continuous variable, significance levels may vary depending participants' hyperopia score. As such, a



Figure 5: Interaction Between Scarcity Appeal and Trait-Hyperopia on Number of Chocolates Eaten
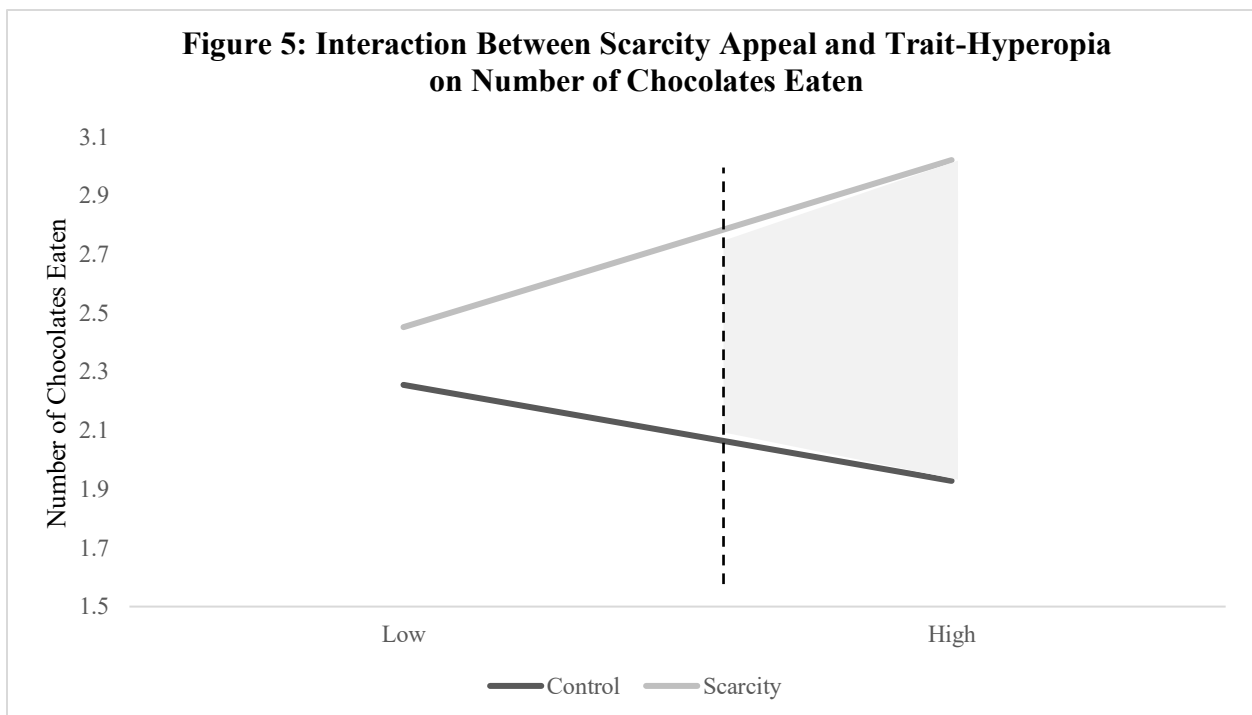
Johnson-Newman analysis was conducted and revealed a significance inflection point at a raw hyperopia score of 22.2 ($\beta_{Conditional}$ = 0.78, $SE$ = 0.41, $t$ = 2.00, $p$ = 0.05), with 31.82% of the sample included in the significance region. However, at a trait-hyperopia score of 29.73, the main effect becomes marginally significant, with 7.58% of the sample comprised in this zone. Overall, 24.24% of the entire sample is comprised in the significance region.

Of note, none of the covariates impacted the model significantly. However, when including participants' general liking of chocolate as a covariate ($\beta_{Liking\ Chocolate}$ = 0.27, $SE$ = 0.17, $t$ = 1.58, $p$ = 0.12), the scarcity main effect almost reaches significance ($\beta_{Scarcity}$ = 0.73, $SE$ = 0.37, $t$ = 1.95, $p$ = 0.056; see Appendix 7 for all results).

Even though Study 4 did not show a consistent main effect of the LTS offer on the number of chocolates eaten it did, however, demonstrate a conditional effect in highly hyperopic individuals (vs. non-hyperopic individuals). Upon further analysis, two alternative explanations could have confounded the above results. For one, Hershey's Hugs come in silver and blue aluminum wrappers, which require consumers to unwrap the candy before eating the chocolate. Thus, an individual could have closely monitored his or her consumption by looking at the number of wrappers on their desk, which could have prompted them to stop eating to avoid over-indulging. Additionally, all participants completed the Hyperopia scale before being exposed to the experimental treatment, which could have primed participants to exhibit hyperopic tendencies temporarily. Thus, the next two studies will attempt to extend and replicate this study's findings while addressing these two potential confounds.

### Study 5: The Impact of Assessing Trait-Hyperopia on State-Hyperopia

The goal of this study is twofold: i) replicate the findings of Study 4 using a different scarcity appeal (i.e., limited-quantity scarcity) and type of indulgence (i.e., a service instead of a product) and ii) investigate whether the mere act of measuring hyperopia may also prime it.

**Participants**

Three hundred and two participants were recruited through MTurk. Participants were offered a nominal monetary fee for their participation in the study. Following a preliminary analysis of the data, 51 participants were removed from the dataset due to issues pertaining to

lack of attention (final $N = 251$, 51.8% female, $M_{Age} = 38.33$, $SD = 11.13$; see Appendix 1 for exclusion criteria).

**Research Design and Procedure**

The order in which participants were exposed to the Hyperopia scale and the scarcity manipulation was counterbalanced to account for any potential priming effect. Participants were thus randomly exposed to either the hyperopia scale or the scarcity manipulation first, and then completed the other task. To measure hyperopia, participants filled out the same Hyperopia scale (Haws and Poynor, 2008) as in previous studies. A reliability analysis of the hyperopia scale revealed a Cronbach's alpha value of 0.86, and aggregate Hyperopia scores, out of a total of 42, were calculated for each respondent ($M_{Hyperopia} = 23.69$, $SD = 8$).

Scarcity was manipulated using a limited-quantity scarcity (LQS) offer for a "relaxing massage." In the limited-quantity condition, the advertisement indicated that there were "only five available" versus "more than 300 available" in the control condition (see Appendix 8 for all materials). Participants were randomly presented with one of the two advertisements and were asked to report their purchase intentions ("How likely would you be to purchase the advertised service?"; 1 = "Not likely at all" to 7 = "Extremely likely") as well as their willingness-to-pay (WTP) for the service should the promotional offer expire ("If the promotional was no longer in effect, how much would you be willing to pay for the advertised service?"); WTP was measured using a slider scale with $25 and $125 as the anchor points.

Participants also completed an IMC adapted from Oppenheimer et al., (2009; see Appendix 8 for all materials). Specifically, participants were asked to report their current mood (1 = "Very unpleasant", 10 = "Very pleasant"). The question ended with the following statement "Although we would like to know how you are feeling, please select nine so we know you are paying attention." This task was meant to assess participants' level of attention to the study's questions, and thus to use as an exclusion criterion for the data analyses.

Next, using a 7-point bipolar scale, participants were asked to indicate if they perceived the service as a necessity or luxury, material good or sensory experience, and hedonic or utilitarian. Participants also indicated their level of familiarity with the service as well as how appealing the massage seemed on a 7-point Likert scale. I also measured the perceived scarcity

of the promotion ("How scarce do you find the promotion in the ad to be?"; 1 = "Not scarce at all", 7 = "Extremely scarce") as well as the believability, attractiveness, and informativeness of the ad (9-point bipolar Likert scale). Finally, participants completed standard demographic questions.

**Preliminary Analyses**

First, to explore the effectiveness of the scarcity manipulation, the mean values for the perceived scarcity of the promotion were compared across the condition (i.e., LQS vs. control). Overall, participants who were randomly assigned to the limited-quantity condition perceived the offer to be scarcer ($M_{LQS}$ = 4.46, $SD$ = 1.88) than those in the control condition ($M_{Control}$ = 3.69, S$D$ = 1.75), indicating that this aspect of the manipulation worked as intended ($F(1, 249)$ = 11.3, $p < 0.01$).

Additionally, to ensure that both groups perceived the advertisements equivalently, the effect of the scarcity manipulation was tested on ad believability, ad attractiveness, ad informativeness, massage familiarity, and massage appeal, as well as the experiential-material, necessity-luxury, and hedonic-utilitarian bipolar items. One-way ANOVAs conducted on each variable using the scarcity manipulation as the predictor are presented in Table 1. As shown in Table 1, none of the differences in means, except for ad believability, are significant, thus indicating that both advertisements were similarly perceived across the two conditions. The significant difference in ad believability perception, or the finding that participants in the control condition perceived the ad to be more believable as compared to those in the LQS condition, may be explained by the quantity of offers available in the LQS condition. Typically, businesses will carry more than five quantities of a good or service, even if offered at a discount, which could have led participants to perceive the ad as less believable as the one where no restrictions were placed on the amount of massages available.

**Table 1: Summary Table of the Effect of Scarcity on the Control Variables – Study 5**

| | Variable | Mean (*SD*) | | ANOVA | | |
|---|---|---|---|---|---|---|
| | | Control (*N* = 124) | LQS (*N* = 127) | *F* | *df* | *p* |
| **Massage** | Experiential-Material | 6.45 (0.88) | 6.28 (1.26) | 1.64 | (1, 249) | 0.20 |
| | Necessity-Luxury | 6.08 (1.05) | 6.11 (1.14) | 0.05 | (1, 249) | 0.83 |
| | Hedonic-Utilitarian | 2.96 (1.72) | 3.24 (2) | 1.46 | (1, 249) | 0.23 |
| | Familiarity | 6.85 (2.19) | 6.57 (2.17) | 1.03 | (1, 249) | 0.31 |
| | Appeal | 7.35 (2.05) | 6.83 (2.54) | 3.08 | (1, 249) | 0.08 |
| **Ad** | Believability | 7.67 (1.35) | 7.14 (2.1) | 5.58 | (1, 249) | *0.02* |
| | Attractiveness | 7.81 (1.5) | 7.43 (1.94) | 3.03 | (1, 249) | 0.08 |
| | Informativeness | 7.02 (1.93) | 6.78 (1.97) | 0.99 | (1, 249) | 0.32 |

**Results and Discussion**

An ANOVA using the dummy-coded scarcity factor (0 = control, 1 = LQS) on trait-hyperopia revealed a significant difference between the limited-quantity group ($M_{LQS}$ = 25.04, $SD$ = 7.01) and the control group ($M_{Control}$ = 22.31, $SD$ = 8.73, $F(1, 249)$ = 7.46, $p < 0.01$). Thus, some of the subsequent results might be impacted by the fact that the distribution of hyperopia as a personality trait is uneven across the two groups.

I then used PROCESS (Model 1; Hayes, 2013) to evaluate if the LQS offer influenced participants' WTP for the massage as a function of their level of trait-hyperopia. Prior to the analyses, I divided each participant's WTP amount by 75 (the regular price for the massage) to calculate the price premium (in percentage, from $25/$75 = 33.33\%$ to $125/$75 = 166.66\%$) each respondent would be willing to pay for the massage if the promotion had expired. The main effect of scarcity on price premium was not significant, indicating that the scarcity manipulation did not impact participants' WTP a premium ($\beta$ = -0.43, $SE$ = 2.74, $t$ = -0.16, $p$ = 0.88). The effect of the hyperopia predictor was marginally significant ($\beta$ = -0.31, $SE$ = 0.18, $t$ = -1.74, $p$ = 0.08), but the interaction between the two predictors was not ($\beta$ = -0.01, $SE$ = 0.35, $t$ = -0.04, $p$ = 0.97).

Next, PROCESS (Model 1; Hayes, 2013) was used to investigate the interactive effect of the scarcity appeal (dummy-coded: control = 0, LQS = 1) and trait-hyperopia (continuous) on purchase intentions for the massage. The interaction model was significant ($F(3,247)$ = 3.28, $p$ = 0.02). The main effect of scarcity on purchase intentions was marginally significant ($\beta$ = -0.46, $SE$ = 0.25, $t$ = -1.85, $p$ = 0.07), but the main effect of hyperopia was not ($\beta$ = -0.01, $SE$ = 0.2, $t$ = -0.66, $p$ = 0.51). The interaction between scarcity and hyperopia was also significant ($\beta$ = 0.07, $SE$ = 0.03, $t$ = 2.13, $p$ = 0.03). To further examine the relationship between scarcity and hyperopia, I conducted a Johnson-Newman analysis, which indicated that the hyperopia value of 23.21 is the turning point from significance to non-significance, with 47.41% of the sample in the region of significance. Because the region of significance is located on the lower end of the hyperopia scale, it appears that, in this particular instance, the scarcity promotion backfired for individuals who are non-hyperopic. Specifically, at one standard deviation below the mean (Hyperopia value of 15.69), the limited-quantity offer negatively impacted consumers' purchase

intentions of the massage ($\beta_{conditional}$ = -1.00, $SE$ = 0.36, $t$ = -.277, $p < 0.01$). The output with mean-centered values is available in Appendix 9.



**Figure 6: Interaction Between Scarcity Appeal and Hyperopia on Purchase Intentions**
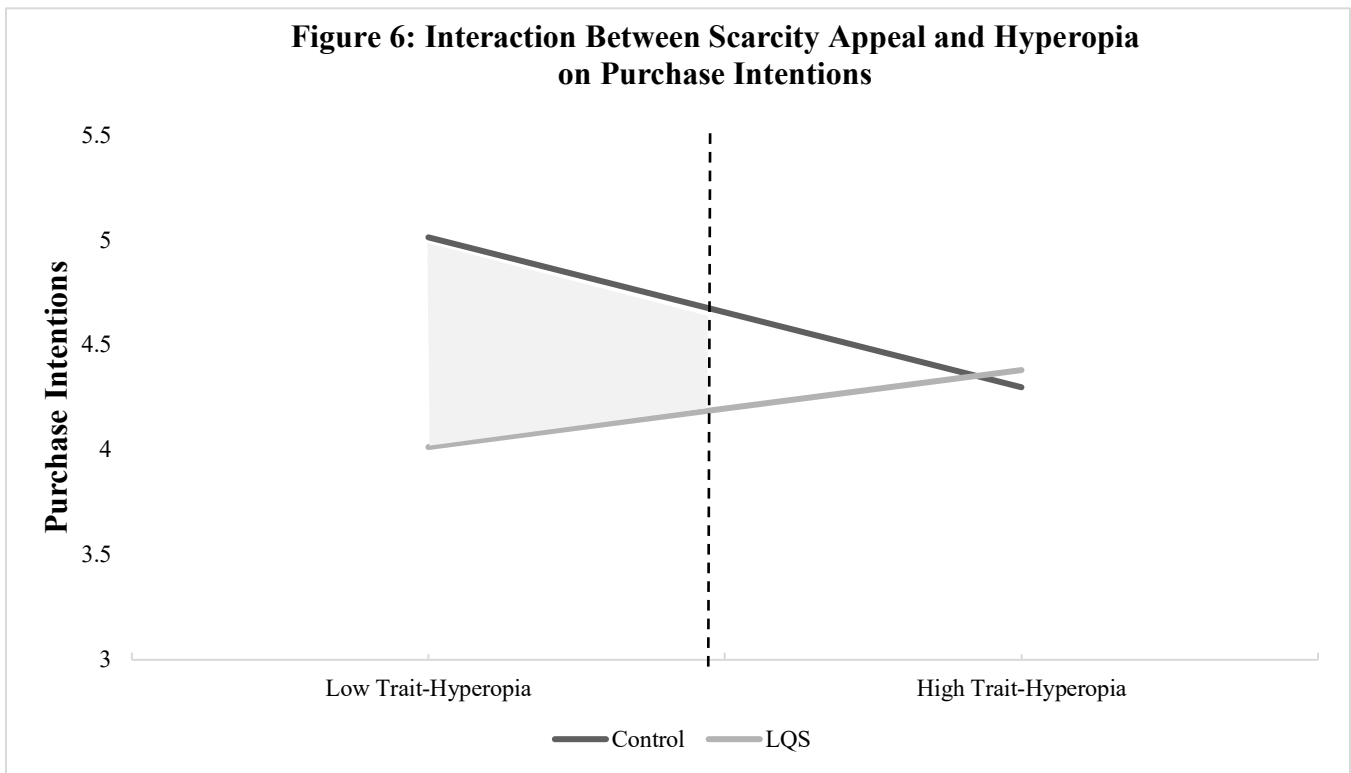
Additionally, as one of this study's objectives was to evaluate the potential priming effect of the hyperopia scale, I conducted a one-way ANOVA on the hyperopia scores using the counterbalance categorical variable as the predictor. Participants who completed the hyperopia scale before being exposed to the scarcity manipulation had a marginally significant lower hyperopia score ($M_{Hyperopia\,first}$ = 22.74, $SD$ = 8.23) than those who completed it after the scarcity manipulation ($M_{Hyperopia\,last}$ = 24.60, $SD$ = 7.71; F(1, 249) = 3.41, $p$ = 0.07). I also conducted a one-way ANOVA on purchase intentions, again using the counterbalance categorical variable as the predictor, which revealed a significant difference between the two display orders ($M_{Hyperopia\,first}$ = 4.21, $SD$ = 2.05; $M_{Hyperopia\,last}$ = 4.71, $SD$ = 1.86; $F(1, 249)$ = 4.12, $p < 0.05$). Taken together, these results suggest that when participants were presented with the hyperopia scale first, they exhibited lower hyperopia scores and lower purchase intentions for the massage than participants who were exposed to the scale after the scarcity manipulation. These results are unexpected as lower purchase intentions would be expected from participants exhibiting higher hyperopia scores but, based on the ANOVA results, participants presented with the hyperopia scale before

indicating their purchase intentions seem to be less hyperopic than those who were exposed to it after making their decision.

To disentangle these effects, I regressed purchase intentions on i) scarcity (dummy coded: $0 =$ control, $1 =$ LQS), ii) hyperopia (continuous), iii) order (dummy coded: $0 =$ scale first, $1 =$ scale last), and their interactions (PROCESS Model 3; Hayes, 2013). The interaction model was significant ($F(7, 243) = 2.50$, $p < 0.05$). The main effect of scarcity on purchase intentions was marginally significant ($\beta = -0.43$, $SE = 0.25$, $t = -1.71$, $p < 0.10$), but the main effect of hyperopia was not ($\beta = -0.01$, SE $= 0.02$, $t= -0.66$, $p > 0.1$). The interaction between scarcity and hyperopia was also significant ($\beta = 0.08$, $SE = 0.03$, $t = 2.53$, $p < 0.05$), indicating that when presented with a limited-quantity offer, consumers' purchase intentions positively increased as one's hyperopic tendencies also increased. The order predictor was also significant ($\beta = 0.49$, $SE = 0.25$, $t = 1.96$, $p = 0.05$), but its interaction with scarcity and hyperopia was not (see Appendix 9 for full results).



Figure 7: The Effect of the Order of Presentation of the Hyperopia Scale on Purchase Intentions
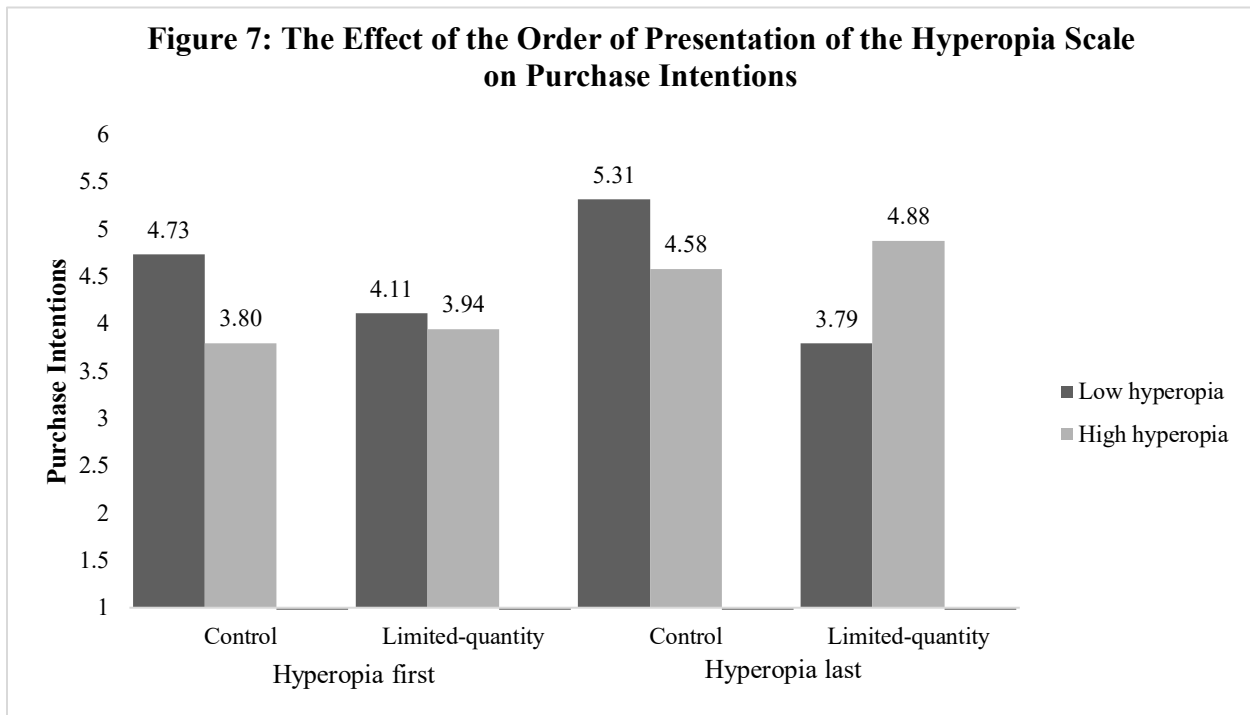
As shown is Figure 7, across three of the four groups, hyperopic individuals exhibit lower purchase intentions for the massage in comparison to non-hyperopic individuals, at least directionally. However, when the hyperopia scale is presented after the dependent variables,

individuals high in hyperopia indicate higher purchase intentions than their non-hyperopic counterparts, which demonstrates a reversal of the effect. Thus, when presented with a LQS offer, highly hyperopic individuals reminded of hyperopia before being exposed to the ad seemed to be better at resisting purchasing the luxurious service than non-hyperopic consumers. However, when highly hyperopic consumers are not reminded of hyperopia before making their decision, they seem to fall prey to the LQS effect, in contrast with non-hyperopic consumers, which could indicate that limited-quantity promotions are effective at circumventing hyperopic individuals' restrictive behaviours, but only when these consumers are not reminded of their consumption pattern first.

This pattern could also be explained by sample characteristics. As stated previously, MTurk participants tend to belong to a lower income group (Paolacci et al., 2010), thus the effect of the prime could have been too weak to overcome respondents' inclination to favour a necessity over an indulgence, much like in Study 3. Additionally, as previously discussed, the distribution of hyperopia was uneven across the two scarcity conditions, which could be due to a simple fluke in random assignment. Finally, due to the hyperopia scale counterbalance variable, participants who took the hyperopia scale last also completed the IMC before doing so, whereas participants who answered the scale first were only exposed to the IMC after doing so. As such, the results for participants who took the scale last might be more accurate as they might have been paying more attention.

**Study 6: The Effect of Scarcity Appeals on State-Hyperopic Consumers' Behavior**

This study addresses the two potential confounds (i.e., unwrapping the Hershey hugs could have helped participants monitor their consumption and answering the trait-hyperopia scale might have induced a hyperopic state) brought up in the discussion section of Study 4, and builds on the previous study's results. This study is divided into two components for analyses: First, I will use a method similar to the one used in Study 4 to investigate the interaction between a scarcity appeal and trait-hyperopia on the actual consumption of an indulgence. Second, building on the literature on priming effects, participants were also exposed to a state-hyperopia manipulation to temporarily induce hyperopic tendencies, in order to explore if reminders of past hyperopic behavior can lead to changes in one's propensity to indulge.

**Participants**

One hundred and ninety-seven undergraduate students participated in this study for one course credit. A preliminary evaluation of the data led to the dismissal of 48 participants due to issues pertaining to dietary restrictions, language barrier, and lack of attention (final $N = 149$, 48.3% female, $M_{Age} = 22.3$, $SD = 8.25$; see Appendix 1 for exclusion criteria).

**Research Design and Procedure**

First, participants completed the same Sports Participation IMC as in previous studies (see Appendix 2 for materials). They were then randomly assigned to either a state-hyperopia or a control condition using the same episodic recall task as in previous studies. Next, participants were randomly assigned to either a scarcity condition (i.e., limited-time scarcity appeal; LTS) or a control condition. Scarcity was operationalized using the same manipulation as in Study 4, except that the product was replaced with Nestlé's Smarties (adapted from Mehta et al., 2014). Specifically, in the scarcity condition, participants were told that they would have the "unique opportunity, today only" to sample limited edition Spring-themed Smarties, "a deliciously decadent chocolate treat wrapped in a pastel-coloured coating." In the control condition, the "unique opportunity, today only" statement was omitted (see Appendix 10 for all materials). After consenting to eat the chocolates, students were given a bowl containing 50 grams of Smarties and were instructed to sample them at their own pace. The taste and tasting experience of the Smarties were then measured (1 = "Not at all, 7 = "Very much"), in line with the cover story used in the study.

Next, participants completed a categorization task adapted from Haws and Poynor (2008). Participants were given a list of 10 luxury items (e.g., massage, designer jeans, iPad) and 10 necessities (e.g., groceries, batteries, oil change; see Appendix 10 for complete list) and were instructed to categorize each item as either a necessity or a luxury. Participants were then asked to indicate their previous experience with Nestlé's Spring-themed Smarties (categorical variables; "Yes", "No", "Maybe") and the extent to which they like Smarties in particular and chocolate in general (1 = "Not at all", 5 = "Very much"). Participants also reported to what extent they watch they eat (1 = "Not at all, 6 = "Very much"), if they are currently on a diet (1 = "Not at all, 6 = "Very much") as well as how long ago they last ate, in hours, on a slider scale with 0 and 10 as the extreme anchor points.

In addition, participants answered justification items. Specifically, they were asked how justifiable their decision to have eaten the amount of candies was (1 = "Not at all justifiable", 10 = "Extremely justifiable"), how easy it was for them to defend their decision (1 = "Not easy to defend at all", 10 = "Very easy to defend"), and how logical their decision was (1 = "Very illogical", 10 = "Very logical"). A reliability analysis on the three justification items yielded a Cronbach's alpha of 0.87, and aggregate Justification scores were calculated for each participant ($M_{Justification}$ = 20.52, $SD$ = 7.49). Finally, participants completed the 6-item Hyperopia scale (Haws and Poynor, 2008) and completed standard demographic questions. A reliability analysis of the Hyperopia scale yielded a Cronbach's alpha value of 0.77, thus validating the reliability of the scale. An aggregate Hyperopia score, out of 42, was thus calculated for each participant ($M_{Hyperopia}$ = 19.03, $SD$ = 6.84). After participants left the lab, the research assistant measured the amount of Smarties left in the bowl and recorded the amount consumed.

## Results and Discussion

First, to investigate if the interaction between trait-hyperopia and scarcity found in Study 5 can be replicated, only the participants who were not exposed to the hyperopia manipulation (i.e., those in the state-hyperopia control condition) were included in this analysis ($N$ = 76, 44.7% female, $M_{Age}$ = 21.79, $SD$ = 2.78). Using PROCESS (Hayes, 2013), I conducted a moderation analysis using scarcity as the independent variable, the amount of chocolate eaten (in grams) as the dependent variable, and trait-hyperopia as the moderator. The model was not significant ($F$(3, 72) = 0.60, p > 0.05), as well as none of the predictors, including the interaction between scarcity and trait-hyperopia (see Appendix 11 for all results). Since the extent to which participants like chocolate was added as a covariate in Study 4 and produced marginal results, the model was reanalysed using the same variable, but including the covariate did not improve the model in this case (see Appendix 11 for all results).

Next, I evaluated the interaction effect of state-hyperopia and scarcity on the categorization task and the amount of Smarties eaten using the entire cleaned sample. To analyze the results of the categorization task, all items marked as luxuries were assigned a value of 1, and items marked as necessities a value of 0 for each participant. Then, an aggregate luxury rating index was calculated, out of 20, where a higher score on the index indicates that participants rated more items as luxuries rather than necessities ($M_{Luxury\ Rating}$ = 10.60, $SD$ = 2.36). An

ANOVA conducted on the luxury rating variable using state-hyperopia as the predictor revealed no main effect of the manipulation on ratings ($M_{Hyperopia}$ = 10.44, $SD$ = 2.08; $M_{Control}$ = 10.75, $SD$ = 2.61, $F(1, 145)$ = 0.65, $p > 0.05$).

Further, a 2-way ANOVA conducted on the amount of Smarties eaten (in grams) using a 2 (state-hyperopia: primed vs. control) X 2 (scarcity: LTS vs. control) between-subject design revealed a significant main effect of the hyperopia manipulation ($F(1, 145)$ = 6.63, $p < 0.05$) on Smarties consumption. The scarcity main effect was not significant, nor was the interaction between the two factors (see Appendix 12 for all results). Pairwise comparisons for the hyperopia main effect revealed that the effect was significant only when participants were primed with state-hyperopia (and not in the control state-hyperopia condition). Specifically, participants who were primed with state-hyperopia ate more smarties in the control$_{scarcity}$ condition than those in the limited-time scarcity condition ($M_{Control-scarcity}$ = 18.43, $SD$ = 16.64, $M_{LTS}$ = 15.72, $SD$ = 16.64, $F(1, 145)$ = 6.35, $p < 0.05$), contrary to what I predicted. An additional 2-way ANOVA on the justification scores also revealed no significant main effect of the manipulations, as well as no significant interaction (see Appendix 12 for full results).

Even if the previous results suggest otherwise, to investigate if justification mediates the relationship between scarcity and hyperopia on the amount of Smarties eaten, a moderated-mediation analysis was conducted using PROCESS (Model 8; Hayes, 2013). The analysis was not significant, as well as none of the coefficient (see Appendix 12 for all results).

**Figure 8: Moderated-Mediation Model (PROCESS Model 8)**
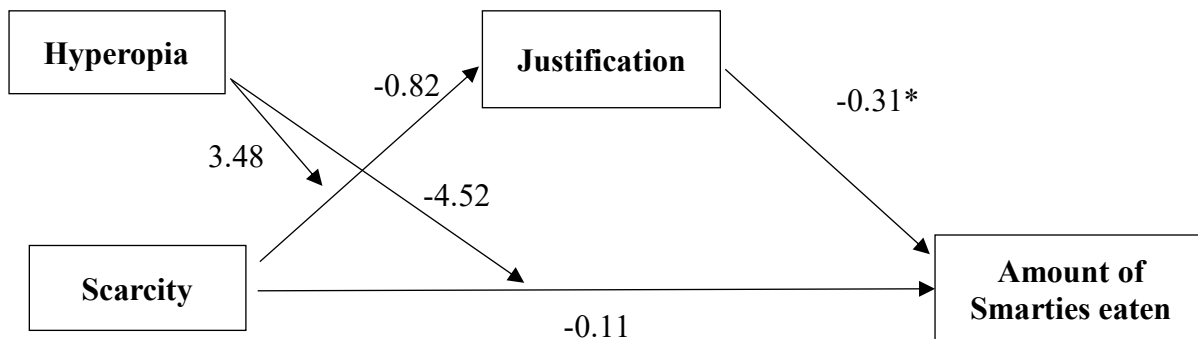


Note : $*p$ = 0.10

Several reasons could explain why I was unable to replicate the findings from Study 4 in this study. First, the scarcity main effect might have failed because the scarcity manipulation was

not strong enough. Indeed, since in both conditions the product was advertised as a "limited-edition," participants assigned to the control group could have also perceived it as scarce, even though I was trying to manipulate the perceived scarcity of the opportunity. Additionally, looking at the frequency distribution of the question "Have you tried Nestlé's Spring-themed Smarties before?" revealed that 33 participants indicated that they had tried the product before, which could have hindered the perceived scarcity of the product or the opportunity.

That being said, the effect of justification on consumption is marginally significant in the moderated-mediation model, and the negative coefficient indicates that the more justification individuals were able to provide for the amount of Smarties eaten, the less they ate. This result is contrary to the literature on justification, as individuals are more likely to indulge when they can provide a justification for the behavior (Kivetz and Simonson, 2002b). However, as previously stated, since not all participants were exposed to the justification scale items at the same time, this could have potentially biased the measure.

**General Discussion**

This thesis' central objective was to investigate the interplay between scarcity promotions and hyperopia. Based on the literature on scarcity promotions, prior findings have shown that scarcity promotions increase consumers' purchase intentions (Aggarwal et al., 2011, Lynn, 1989), valuation (Lynn, 1989, Worchel et al., 1975), and preferences (Verhallen and Robben, 1994). Additionally, the literature on hyperopia has identified that hyperopic consumers exhibit a chronic aversion to indulgences (Haws and Poynor, 2008), which translates into increased experienced regret in the long-run (Kivetz and Keinan, 2006; Haws and Poynor, 2008). However, past research has also shown that hyperopic consumers can be swayed to indulge by framing the indulgence as a long-term investment (Haws and Poynor, 2008) or by prompting them to self-focus (Mehta et al., 2014). Kivets and Keinan (2006) also showed that cognitive processing can limit the amount of regret hyperopic consumers experience as a result of indulgence inaction, as a function of time. Moreover, in the context of licensing, past research has found that individuals are more likely to indulge when they can provide a justification for the indulgence (Khan and Dhar, 2006; Kivetz and Keinan, 2006; Xu and Schwarz, 2009) or to pay for indulgences with time rather than money (Okada, 2005; Kivetz and Zheng, 2006). Taken together, the present research set out to test if scarcity promotions can act as a justification

mechanism to aid hyperopic consumers circumvent their restrictive consumption patterns. Additionally, building on the literature on personality states (Fleeson, 2007), I also investigated if hyperopia can be primed temporarily.

Across six studies, I attempted to provide support for a situational manipulation of hyperopia, and found that the prime did not impact related personality traits (Study 1). Then, I demonstrated that high trait-hyperopia consumers tend to prefer necessities over luxuries, when operationalized as picking a gift card for groceries over one for a fancy dinner, but only when hyperopia is also activated as a state (Study 2). Moreover, I found evidence that, when hyperopia is activated as a state, consumers reminded of missed and regretted opportunities to indulge tend to justify indulging less (Study 3). I also found that high trait-hyperopia consumers indulge more (i.e., eat more chocolates) when the opportunity to do so is framed as limited (vs. not; Study 4), and that the mere fact of measuring trait-hyperopia can impact the effectiveness of scarcity appeals (Study 5). However, I found that the effects of scarcity promotions and situational hyperopia on the actual consumption of an indulgence was not mediated by justification, contrary to my initial predictions (Study 6).

**Theoretical and Managerial Contributions**

Theoretically, the present research contributes to the literatures on scarcity promotions and hyperopia by showing that scarcity promotions can help consumers high in trait-hyperopia circumvent their resistance to indulge, especially when their consumption tendencies are not salient. Additionally, this research also contributes to the literature on situationally primed personality traits by showing that cues in consumers' environments can lead to situational hyperopia, which manifests through a decrease in actual consumption when paired with scarcity promotions and operates in tandem with regret. Moreover, when hyperopia is situationally activated, its effect is highly contingent on the individual's level of trait-hyperopia. Finally, even though the state-level versus trait-level hyperopia findings are conflicting when it comes to actual consumption following a scarcity appeal (i.e., in Study 1, highly hyperopic participants indulged more, whereas in Study 3, individuals primed with hyperopia indulged less), the present research shows that merely recalling a past missed indulgence opportunity leads consumers to act in a more stringent manner, but only if the individual is also high in trait-hyperopia.

This research also provides implications for marketing managers and practitioners. For one, it indicates that scarcity promotions are not only highly dependent on the nature of the offering (i.e., hedonic, utilitarian), in line with prior research (Aggarwal et al., 2011; Ku et al., 2013), but that personality differences in the target market can also influence the effectiveness of such marketing strategy. Whereas scarcity promotions can be efficient for highly trait-hyperopic individuals, they can also be detrimental for individuals reminded of their hyperopic consumption patterns. This finding is particularly important for marketers of brands and products perceived as luxuries or indulgences, such as food marketers. For example, if a dieter chronically resists indulging and is then presented with a limited-time promotional offer for an indulgence (e.g., ice cream) with a tagline reminiscent of hyperopia (e.g., "Seizing the day can be difficult. We're here to help."), the dieter might forego purchasing the temptation. Thus, this indicates the importance of integrating a company's marketing communications to avoid diverging strategies (i.e., scarcity and reminders of hyperopia, or too much self-control). Additionally, since individuals who have recently foregone an indulgence and regret doing so are more likely to shift away from an utilitarian choice than those who do not regret the missed opportunity, marketers of brands and products perceived as luxuries or indulgences should consider incorporating past regret in their campaigns. For instance, a dieter might be more easily swayed into purchasing ice cream if the advertisement also highlights the regret inherent to abstinence (e.g., "Don't repeat the same mistake twice. Regret belongs in the past.")

**Limitations, Future Research, and Learnings**

The present research is comprised of several limitations that pave the way for future research in the areas of scarcity promotions and hyperopia, respectively. First, almost none of the main effects across all studies were significant, which could be due in part to the fact that in Studies 4 and 6, the limited-time scarcity manipulations were not pre-tested. Researchers interested in this topic should thus carefully pretest their manipulations before attempting to replicate this research's findings in order to establish their reliability. Dependent variables, such as the gift card preferences task used in Studies 2 and 3, should also be pretested (i.e., differences in perceptions of hedonism/utilitarianism, necessity/luxury, etc.) to ensure that the various choice options were equally desirable. Additionally, field experiments could also be designed to

evaluate the effectiveness of scarcity promotions on hyperopic consumers in a more realistic setting, thus better generalizing the application of these results.

Future research could investigate whether scarcity appeals have unexpected effects on high trait-hyperopic individuals (based on the results of Study 5). Specifically, high trait-hyperopic consumers may tend to overlook indulgent options in a choice set, given their general aversion to indulge. Because scarcity appeals should help make indulgent options more salient, such appeals may thus help bring back high trait-hyperopic individuals' attention to such options, which could in turn positively impact their behavior toward indulgence. Conversely, scarcity appeals could also make "virtuous" options appear more indulgent, especially to high trait-hyperopic consumers, and thus strengthen their preferences for such options even further, given prior work demonstrating that scarce foods are perceived as having more calories (and thus less healthy; Salerno and Sevilla, 2019). Further research is thus needed to better understand the effect of scarcity appeal on high trait-hyperopic individuals.

Future research could also investigate if scarcity promotions used for services versus products are perceived differently by hyperopic consumers. Even if this research suggests that both are treated equally, as the type of scarcity promotion used in Studies 4 through 6 are categorically different (i.e., limited-time in Study 4 and 6 vs. limited-quantity in Study 5), future research could evaluate if purchase intentions differ based on the nature of the offering, since no robust conclusion in this area can be derived from this thesis' results. This research stream is particularly fruitful as prior research has identified that the effectiveness of scarcity appeals differs based on a limited-time or limited-quantity tactic (Aggarwal et al., 2011). Moreover, as this research primarily focused on investigating the role of scarcity appeals in a hedonic context, future research would benefit from exploring if scarcity tactics operate in the same way for hedonic and utilitarian products.

Further, given the stringent exclusion criteria used across all studies, the attrition rate could have impacted some of the results. For example, when I evaluated respondents' answers to the hyperopia episodic recall task, a significant share of participants indicated events suggesting a lack of knowledge of what an indulgence actually is. Some individuals indicated events related to immoral behaviour (e.g., not stealing someone's wallet) or even addiction (e.g., not smoking cigarettes this week), which suggests that the wording of the listing task was too vague for some

participants. Additionally, as I was the only researcher to evaluate the appropriateness of each statement, biases in selection could have emerged, which could be potentially problematic given the high attrition rate in this research. As such, future research on state-hyperopia should investigate if hyperopia can be primed using other methods, for example through scenarios of missed indulging opportunities or advertisements advocating for self-restraint. Moreover, future research could look more closely at the role of regret on hyperopia and how they jointly impact justification and indulgent behavior. In this thesis, only Study 3 investigated the role of regret, and some confounds could be biasing the results. Specifically, the control$_{regret}$ condition was not a "true" control, as the instructions still indicated that participants should report on a few things that they regret not having done in the past, thus potentially also priming hyperopia.

Finally, since support for justification as the mechanism underlying the effect of hyperopia on indulgence was not found, both in the context of scarcity promotions and regret, future research could evaluate if another psychological process is at play or use a different measure of justification. For example, Okada (2005) manipulated justification by shifting the onus of deciding to indulge away from the individual onto one of their friends. This rationale implies that if one is exempted from the responsibility of choosing to indulge, asking them which item (i.e., hedonic vs. utilitarian) they hope their friend will choose indicates a preferred choice free from justification. Thus, future research could further study how justification operates in hyperopic consumers, both from a theoretical and methodological standpoint.

Since this research project was pedagogical in nature, I would also like to comment on some of my key learnings. First, I learned that excluding too many participants can interfere with random assignment and lead to erroneous results, and that scales should be averaged rather than summed to facilitate their interpretation. I also learned that sample characteristics can heavily impact how theoretical constructs and their underlying mechanisms operate. For example, Turkers tended to report stronger preferences for the groceries gift card (vs. fancy dinner gift card), irrespective of which treatment they were exposed to. Undergraduate students' preferences, on the other hand, were more varied. I also observed a similar pattern in terms of justification, where Turkers reported higher justification scores than the undergraduate students. Additionally, I observed varying degrees of performance in how respondents completed the hyperopia episodic recall task. Since the manipulation was language-based, respondents who

were less proficient in English struggled to grasp some of the instructions. Both observations show the importance of carefully pretesting manipulations with different samples to more strongly establish their effectiveness.

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# APPENDICES

## Appendix 1: Exclusion Criteria for all Studies

Note that the same exclusion criteria were applied across studies sampled from the same subject pool (i.e., MTurk vs. undergraduate students).

**Study 1**

*Frugality measure.* The initial sample size was 151. One participant was removed from the sample for having taken longer than 3± standard deviations to complete the questionnaire, in seconds ($M_{Duration}$ = 378.47, $SD$ = 243.21), as the prime might have become ineffective. An additional 42 participants were removed since they failed the Instructional Manipulation Check (IMC), which is indicative of a lack of attention. Eight participants were further removed for having failed the episodic recall task, as judged by this thesis' researcher. Erroneous answers include statements that were not examples, but rather abstract concepts, examples of immoral behavior or addiction rather than indulgence, or simply blank statements (e.g., ?, *, NA). Finally, six participants were also taken out of the sample for having indicated that they experienced technical difficulties, distractions, or that their data was not reliable. The final size for this study was 102 (eight participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 57 instead of 49).

*Tightwad-Spendthrift measure.* The initial sample size was 151. Five participants were removed from the sample for having taken longer than 3± standard deviations to complete the questionnaire, in seconds ($M_{Duration}$ = 418.07, $SD$ = 291.24), as the prime might have become ineffective. An additional 55 participants were removed since they failed the IMC, which is indicative of a lack of attention. Eight participants were further removed for having failed the episodic recall task, as judged by this thesis' researcher. Erroneous answers include statements that were not examples, but rather abstract concepts, examples of immoral behavior or addiction rather than indulgence, or simply blank statements (e.g., ?, *, NA). Finally, four participants were also taken out of the sample for having indicated that they experienced distractions, or that their data was not reliable. The final size for this study was 88 (nine participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 72 instead of 63).

*Self-Control measure.* The initial sample size was 150. Three participants were removed from the sample for having taken longer than 3± standard deviations to complete the questionnaire, in seconds ($M_{Duration}$ = 356.78, $SD$ = 179.20), as the prime might have become ineffective. An additional 50 participants were removed since they failed the IMC, which is indicative of a lack of attention. Eight participants were further removed for having failed the episodic recall task, as judged by this thesis' researcher. Erroneous answers include statements that were not examples, but rather abstract concepts, examples of immoral behavior or addiction rather than indulgence, or simply blank statements (e.g., ?, *, NA). Finally, five participants were also taken out of the sample for having indicated that they experienced technical difficulties, distractions, or that their

data was not reliable. The final size for this study was 92 (eight participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 66 instead of 58).

*Trait-hyperopia measure.* The initial sample size was 150. Three participants were removed from the sample for having taken longer than 3± standard deviations to complete the questionnaire, in seconds ($M_{Duration}$ = 382.23, $SD$ = 304.73), as the prime might have become ineffective. An additional 50 participants were removed since they failed the IMC, which is indicative of a lack of attention. Seven participants were further removed for having failed the episodic recall task, as judged by this thesis' researcher. Erroneous answers include statements that were not examples, but rather abstract concepts, examples of immoral behavior or addiction rather than indulgence, or simply blank statements (e.g., ?, *, NA). Finally, eleven participants were also taken out of the sample for having indicated that they experienced technical difficulties, distractions, or that their data was not reliable. The final size for this study was 92 (13 participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 71 instead of 58).

**Study 2**

The initial sample size was 105, but 18 participants were removed for having failed the IMC twice. An additional seven participants were also removed for having failed the episodic recall task, as judged by this thesis' researcher. Erroneous answers include statements that were not examples, but rather abstract concepts, examples of immoral behavior or addiction rather than indulgence, or simply blank statements (e.g., ?, *, NA). Finally, 13 participants were also removed for having reported a level of knowledge of the English language below 5 (1 = Very basic to 6 = Native or bilingual). Since the study's manipulations rest on subtle textual changes, an inability to comprehend the vocabulary used in the study was deemed problematic. The final sample size for this study was 72 (five participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 38 instead of 33).

**Study 3**

The initial sample size was 603. Fourteen participants were removed from the sample for having taken longer than 3± standard deviations to complete the questionnaire, in seconds ($M_{Duration}$ = 453.09, $SD$ = 369.77). Fifteen participants were disqualified for having improperly answered the episodic recall task. Further, 31 participants were removed for having reported technical difficulties, distractions, or for having self-reported that their data should not be used in the study. The final sample size was 552 (nine participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 60 instead of 51).

**Study 4**

The initial participant pool consisted of 97 participants. 13 participants were removed from the sample for having failed the IMC twice, which is indicative of a lack of attention. An additional two participants were taken out of the sample since they could not eat the chocolates due to dietary restrictions, and one other participant was removed due to an error in logging their amount of chocolate eaten (missing value). Finally, 17 participants were also removed from the sample since their self-reported level of knowledge of the English language (1 = Very basic to 6

= Native or bilingual) was below 5. Since the study's manipulations rest on subtle textual changes, an inability to comprehend the vocabulary used in the study was deemed problematic. The final sample size for this study was 66 (two participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 33 instead of 31).

**Study 5**

The initial participant pool consisted of 302 participants. Eight participants were removed from the sample for having taken longer than 3± standard deviations to complete the questionnaire, in seconds ($M_{Duration}$ = 309.22, $SD$ = 178.46), as the effect of the manipulation may have decreased with time. An additional 35 participants were removed because they failed the IMC, which is indicative of a lack of attention. Finally, 14 participants were also taken out of the sample for having indicated that they experienced technical difficulties, distractions, or that their data was not reliable. The final sample size for this study was 251 (six participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 57 instead of 51).

**Study 6**

As stated in the methods section of Study 6, I first looked at the effect of hyperopia on scarcity and indulgence for the subset of participants who were not exposed to the hyperopia manipulation. The original size for this sample was 99. However, seven participants were disqualified for having failed the IMC twice, for the same reason as in previous studies. Additionally, six participants also indicated that they could not eat the chocolates and therefore were not included in the analyses. Further, 12 participants reported a level of knowledge of English (1 = Very basic to 6 = Native or bilingual) lower than 5 and were thus removed from the sample. The final sample size for this first analysis was 76 (two participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 25 instead of 23).

In the second part of Study 6's analyses, the initial sample size was 197. Twelve participants were not included in the analyses for having failed the IMC twice. Further, 11 participants were subsequently removed as they could not eat the chocolates. Further, 20 participants reported an English knowledge score lower than 5, and were therefore removed from the dataset (1 = Very basic to 6 = Native or bilingual). Finally, 15 participants were further removed because they failed to follow the instructions of the episodic recall task. Erroneous answers included statements that were abstract concepts rather than concrete examples, examples of immoral behavior rather than indulgences, or simply blank statements (e.g., ?, *, N/A). The final sample size for this study was 149 (10 participants were disqualified for two or more reasons, hence why the total of participants disqualified equals 58 instead of 48).

# Appendix 2: Study 1 Materials

## 2.1 Sports Participation Attention Check

**SPORTS PARTICIPATION**

Most modern theories of decision making recognize the fact that decisions do not take place in a vacuum. Individual preferences and knowledge, along with situational variables can greatly impact the decision process. In order to facilitate our research on decision making we are interested in knowing certain factors about you, the decision maker. Specifically, we are interested in whether you actually take the time to read the directions; if not, then some of our manipulations that rely on changes in the instructions will be ineffective. So, in order to demonstrate that you have read the instructions, please ignore the question and select curling instead.

### Which of these activities do you engage in regularly?
### (click all that apply)

- ☐ Skiing
- ☐ Soccer
- ☐ Snowboarding
- ☐ Running
- ☐ Hockey
- ☐ Football

- ☐ Swimming
- ☐ Tennis
- ☐ Curling
- ☐ Basketball
- ☐ Cycling
- ☐ None of these, I prefer:

## 2.2 Episodic Recall Task - Control

**Briefly describe three or four things that you did in the past week.** They can be activities, interactions you had with other people, or anything else that first comes to mind:

1. [                                        ]
2. [                                        ]
3. [                                        ]
4. [                                        ]

**Now please write 3-5 sentences elaborating on two of the things that you mentioned above.** Please think about the feelings that you experienced. How did engaging in the activity make you feel? Why do you think that activity was particularly memorable?

1. [                                        ]

2. [                                        ]

## 2.3 Episodic Recall Task – Hyperopia Manipulation

**Briefly describe three or four times when you prevented yourself from indulging or from doing something indulgent because you felt it was not the right thing to do.** They can be specific situations, prior instances, or anything else that first comes to mind:

1. [                                        ]
2. [                                        ]
3. [                                        ]
4. [                                        ]

**Now please write 3-5 sentences elaborating on two of the things that you mentioned above.** Please think about what you experienced. Why did you feel like you shouldn't indulge or pamper yourself? Why did you prevent yourself from enjoying a "luxury"?

1. [                                        ]

2. [                                        ]

## 2.4 8-item Frugality Scale (Lastovicka et al., 1999)

**Please indicate the extent to which you agree with the following statements:**

|  | Strongly disagree (1) | 2 | 3 | 4 | 5 | Strongly agree (6) |
|---|---|---|---|---|---|---|
| If you take good care of your possessions, you will definitely save money in the long run. | ○ | ○ | ○ | ○ | ○ | ○ |
| There are many things that are normally thrown away that are still quite useful. | ○ | ○ | ○ | ○ | ○ | ○ |
| Making better use of my resources makes me feel good. | ○ | ○ | ○ | ○ | ○ | ○ |
| If you can re-use an item you already have, there's no sense in buying something new. | ○ | ○ | ○ | ○ | ○ | ○ |
| I believe in being careful in how I spend my money. | ○ | ○ | ○ | ○ | ○ | ○ |
| I discipline myself to get the most from my money. | ○ | ○ | ○ | ○ | ○ | ○ |
| I am willing to wait on a purchase I want so that I can save money. | ○ | ○ | ○ | ○ | ○ | ○ |
| There are things I resist buying today so I can save for tomorrow. | ○ | ○ | ○ | ○ | ○ | ○ |

## 2.5 4-item Tightwad-Spendthrift Scale (Rick et al., 2008)

Which of the following descriptions fits you better?

| Tightwad (difficulty spending money - 1) | 2 | 3 | 4 | 5 | About the same or neither | 7 | 8 | 9 | 10 | Spendthrift (difficulty controlling spending - 11) |
|---|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Please consider the two descriptions below.**

Some people have trouble limiting their spending: they often spend money—for example on clothes, meals, vacations, phone calls—when they would do better not to.

Other people have trouble spending money. Perhaps because spending money makes them anxious, they often don't spend money on things they should spend it on.

How well does the first description fit you? That is, do you have trouble limiting your spending?

| Never (1) | Rarely (2) | Sometimes (3) | Often (4) | Always (5) |
|-----------|------------|---------------|-----------|------------|
| ○ | ○ | ○ | ○ | ○ |

How well does the second description fit you? That is, do you have trouble spending money?

| Never (1) | Rarely (2) | Sometimes (3) | Often (4) | Always (5) |
|-----------|------------|---------------|-----------|------------|
| ○ | ○ | ○ | ○ | ○ |

**Below is a scenario describing the behavior of two shoppers. After reading about each shopper, please answer the question that follows.**

Mr. A is accompanying a good friend who is on a shopping spree at a local mall. When they enter a large department store, Mr. A sees that the store has a "one-day-only-sale" where everything is priced 10-60% off. He realizes he doesn't need anything, yet can't resist and ends up spending almost $100 on stuff.

Mr. B is accompanying a good friend who is on a shopping spree at a local mall. When they enter a large department store, Mr. B sees that the store has a "one-day-only-sale" where everything is priced 10-60% off. He figures he can get great deals on many items that he needs, yet the thought of spending the money keeps him from buying the stuff.

In terms of your own behavior, who are you more similar to, Mr. A or Mr. B?

| Mr. A (1) | 2 | About the same or neither | 4 | Mr. B (5) |
|-----------|---|---------------------------|---|-----------|
| ○ | ○ | ○ | ○ | ○ |

## 2.6 13-item Brief Self-Control Scale (Tangney and Baumeister, 2004)

Using the scale provided, please indicate how much each of the following statements reflects how you typically are.

| | Not at all (1) | 2 | 3 | 4 | Very much (5) |
|---|---|---|---|---|---|
| I am good at resisting temptation. | ○ | ○ | ○ | ○ | ○ |
| I have a hard time breaking bad habits. | ○ | ○ | ○ | ○ | ○ |
| I am lazy. | ○ | ○ | ○ | ○ | ○ |
| I say inappropriate things. | ○ | ○ | ○ | ○ | ○ |
| I do certain things that are bad for me, if they are fun. | ○ | ○ | ○ | ○ | ○ |
| I refuse things that are bad for me. | ○ | ○ | ○ | ○ | ○ |
| I wish I had more self-discipline. | ○ | ○ | ○ | ○ | ○ |
| People would say that I have iron self-discipline. | ○ | ○ | ○ | ○ | ○ |
| Pleasure and fun sometimes keep me from getting work done. | ○ | ○ | ○ | ○ | ○ |
| I have trouble concentrating. | ○ | ○ | ○ | ○ | ○ |
| I am able to work effectively toward long-term goals. | ○ | ○ | ○ | ○ | ○ |
| Sometimes, I can't stop myself from doing something, even if I know it's wrong. | ○ | ○ | ○ | ○ | ○ |
| I often act without thinking through all the alternatives. | ○ | ○ | ○ | ○ | ○ |

**2.7: 6-item Hyperopia Scale (Haws and Poynor, 2008)**

Please indicate the extent to which you agree with the following statements:

|  | Strongly disagree (1) | 2 | 3 | 4 | 5 | 6 | Strongly agree (7) |
|---|---|---|---|---|---|---|---|
| I have difficulty pampering myself. | O | O | O | O | O | O | O |
| I rarely enjoy the luxuries life has to offer. | O | O | O | O | O | O | O |
| I often fail to enjoy attractive opportunities. | O | O | O | O | O | O | O |
| It's hard for me to make myself indulge. | O | O | O | O | O | O | O |
| "Seizing the day" is difficult for me. | O | O | O | O | O | O | O |
| I regret missed opportunities to enjoy rich experiences in the past. | O | O | O | O | O | O | O |

# Appendix 3: Study 2 Materials

## 3.1 Gift Card Preferences
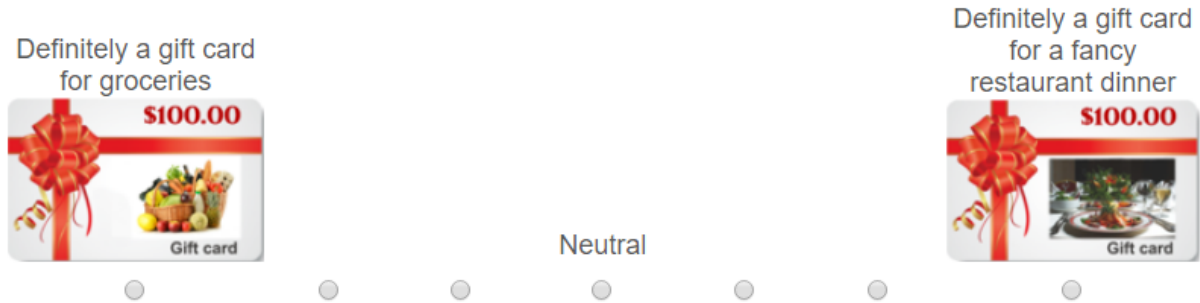


## 3.2 Brief Mood Introspection Scale (Mayer and Gaschke, 1998)

Select the responses on the scale below based on how well each adjective or phrase describes your present mood:

|  | Definitely do not feel | Do not feel | Slightly feel | Definitely feel |
|---|---|---|---|---|
| Lively | ○ | ○ | ○ | ○ |
| Happy | ○ | ○ | ○ | ○ |
| Sad | ○ | ○ | ○ | ○ |
| Tired | ○ | ○ | ○ | ○ |
| Caring | ○ | ○ | ○ | ○ |
| Content | ○ | ○ | ○ | ○ |
| Gloomy | ○ | ○ | ○ | ○ |
| Jittery | ○ | ○ | ○ | ○ |
| Drowsy | ○ | ○ | ○ | ○ |
| Grouchy | ○ | ○ | ○ | ○ |
| Peppy | ○ | ○ | ○ | ○ |
| Nervous | ○ | ○ | ○ | ○ |
| Calm | ○ | ○ | ○ | ○ |
| Loving | ○ | ○ | ○ | ○ |
| Fed up | ○ | ○ | ○ | ○ |
| Active | ○ | ○ | ○ | ○ |

## 3.3 Study 2 Output (mean-centered values)


Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.1 ******************

          Written by Andrew F. Hayes, Ph.D.          www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3


**************************************************************************
Model = 1
    Y = GiftCa_1
    X = Hyperopi
    M = SumHyper

Sample size
        72


**************************************************************************
Outcome: GiftCa_1

Model Summary
          R         R-sq        MSE           F        df1        df2          p
      .3921       .1538      6.1801      4.1188      3.0000     68.0000       .0096

Model
            coeff         se          t          p        LLCI        ULCI
constant     3.8621      .2930    13.1823      .0000      3.2775      4.4467
SumHyper     -.1032      .0439     -2.3519      .0216      -.1907      -.0156
Hyperopi    -1.1021      .5862     -1.8802      .0644     -2.2718       .0676
int_1        -.1847      .0874     -2.1119      .0384      -.3592      -.0102

Product terms key:

 int_1     Hyperopi    X     SumHyper


R-square increase due to interaction(s):
        R2-chng          F        df1        df2          p
int_1      .0555      4.4602     1.0000     68.0000       .0384

**************************************************************************

Conditional effect of X on Y at values of the moderator(s):
  SumHyper     Effect         se          t          p        LLCI        ULCI
   -6.7876      .1514      .8343      .1815      .8565     -1.5134      1.8161
     .0000    -1.1021      .5862     -1.8802      .0644     -2.2718       .0676
    6.7876    -2.3556      .8342     -2.8240      .0062     -4.0202      -.6911

Values for quantitative moderators are the mean and plus/minus one SD from
mean.
Values for dichotomous moderators are the two values of the moderator.

******************** JOHNSON-NEYMAN TECHNIQUE *************************

Moderator value(s) defining Johnson-Neyman significance region(s)

```
     Value    % below    % above
     .3758    55.5556    44.4444


Conditional effect of X on Y at values of the moderator (M)
   SumHyper     Effect        se         t         p       LLCI       ULCI
  -11.6111     1.0422     1.1725     .8889     .3772    -1.2975     3.3818
  -10.0611      .7559     1.0572     .7150     .4771    -1.3538     2.8656
   -8.5111      .4697      .9474     .4957     .6217    -1.4209     2.3603
   -6.9611      .1834      .8451     .2170     .8288    -1.5030     1.8698
   -5.4111     -.1028      .7534    -.1365     .8918    -1.6062     1.4005
   -3.8611     -.3891      .6765    -.5751     .5671    -1.7390      .9609
   -2.3111     -.6753      .6201   -1.0891     .2799    -1.9126      .5620
    -.7611     -.9616      .5900   -1.6299     .1077    -2.1388      .2157
     .3758    -1.1715      .5871   -1.9955     .0500    -2.3431      .0000
     .7889    -1.2478      .5902   -2.1142     .0382    -2.4256     -.0701
    2.3389    -1.5341      .6208   -2.4711     .0160    -2.7729     -.2953
    3.8889    -1.8203      .6776   -2.6862     .0091    -3.1725     -.4681
    5.4389    -2.1066      .7548   -2.7909     .0068    -3.6128     -.6004
    6.9889    -2.3928      .8468   -2.8258     .0062    -4.0825     -.7031
    8.5389    -2.6791      .9492   -2.8224     .0062    -4.5732     -.7849
   10.0889    -2.9653     1.0591   -2.7997     .0067    -5.0788     -.8518
   11.6389    -3.2515     1.1744   -2.7686     .0072    -5.5951     -.9080
   13.1889    -3.5378     1.2937   -2.7347     .0080    -6.1192     -.9563
   14.7389    -3.8240     1.4158   -2.7010     .0087    -6.6493     -.9988
   16.2889    -4.1103     1.5402   -2.6687     .0095    -7.1837    -1.0368
   17.8389    -4.3965     1.6663   -2.6384     .0103    -7.7217    -1.0714
   19.3889    -4.6828     1.7939   -2.6105     .0111    -8.2624    -1.1032


****************************************************************************


Data for visualizing conditional effect of X on Y
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/HyperopiaManip SumHyperopia GiftCard_RAW.
BEGIN DATA.

    -.5139    -6.7876     4.4847
     .4861    -6.7876     4.6360
    -.5139      .0000     4.4285
     .4861      .0000     3.3264
    -.5139     6.7876     4.3723
     .4861     6.7876     2.0167

END DATA.
GRAPH/SCATTERPLOT=SumHyperopia WITH GiftCard_RAW BY HyperopiaManip.

******************** ANALYSIS NOTES AND WARNINGS ************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 Hyperopi SumHyper

------ END MATRIX -----
```

56

**Appendix 4: Study 3 Materials**

## 4.1 Regret and Hyperopia Manipulation

Briefly describe three or four times when you prevented yourself from indulging, or from doing something indulgent because you felt it was not the right thing to do, and you regretted it. They can be specific situations, prior instances, or anything else that first comes to mind:

1. 
2. 
3. 
4. 

Now please write 3-5 sentences elaborating on two of the things that you mentioned above. Please think about what you experienced. Why did you feel like you shouldn't indulge or pamper yourself? Why did you prevent yourself from enjoying a "luxury"? Why did you regret not letting yourself indulge?

1. 
2. 

## 4.2 Regret Manipulation

Briefly describe three or four things that you regret not having done in the past week. They can be activities, interactions you had with other people, or anything else that first comes to mind:

1. 
2. 
3. 
4. 

Now please write 3-5 sentences elaborating on two of the things that you mentioned above. Please think about the feelings that you experienced. How did not engaging in the activity make you feel? Why did you regret not doing those things?

1. 
2.

# Appendix 5: Study 3 Output

## 5.1 ANOVA on Gift Card Dependent Variable

**Between-Subjects Factors**

| | | Value Label | N |
|---|---|---|---|
| HyperopiaManip | 0 | Control | 321 |
| | 1 | Hyperopia | 231 |
| RegretManip | 0 | Control | 286 |
| | 1 | Regret | 266 |

**Descriptive Statistics**

Dependent Variable: GiftCard_RAW

| HyperopiaManip | RegretManip | Mean | Std. Deviation | N |
|---|---|---|---|---|
| Control | Control | 2.3476 | 2.04728 | 164 |
| | Regret | 2.1720 | 1.97152 | 157 |
| | Total | 2.2617 | 2.00937 | 321 |
| Hyperopia | Control | 2.0082 | 1.66885 | 122 |
| | Regret | 2.6239 | 2.09403 | 109 |
| | Total | 2.2987 | 1.90239 | 231 |
| Total | Control | 2.2028 | 1.89943 | 286 |
| | Regret | 2.3571 | 2.03096 | 266 |
| | Total | 2.2772 | 1.96364 | 552 |

**Tests of Between-Subjects Effects**

Dependent Variable: GiftCard_RAW

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 24.477[a] | 3 | 8.159 | 2.129 | .096 |
| Intercept | 2806.872 | 1 | 2806.872 | 732.420 | .000 |
| HyperopiaManip | .424 | 1 | .424 | .111 | .739 |
| RegretManip | 6.490 | 1 | 6.490 | 1.694 | .194 |
| HyperopiaManip * RegretManip | 20.982 | 1 | 20.982 | 5.475 | .020 |
| Error | 2100.115 | 548 | 3.832 | | |
| Total | 4987.000 | 552 | | | |
| Corrected Total | 2124.592 | 551 | | | |

a. R Squared = .012 (Adjusted R Squared = .006)

**Pairwise Comparisons**

Dependent Variable:  GiftCard_RAW

| HyperopiaManip | (I) RegretManip | (J) RegretManip | Mean Difference (I-J) | Std. Error | Sig.[b] | 95% Confidence Interval for Difference[b] | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Control | Control | Regret | ,176 | ,219 | ,422 | -,254 | ,605 |
| | Regret | Control | -,176 | ,219 | ,422 | -,605 | ,254 |
| Hyperopia | Control | Regret | -,616[*] | ,258 | ,017 | -1,122 | -,109 |
| | Regret | Control | ,616[*] | ,258 | ,017 | ,109 | 1,122 |

Based on estimated marginal means

*. The mean difference is significant at the .050 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

## 5.2 Moderated Mediation Model (PROCESS Model 8; mean-centered)

```
************* PROCESS Procedure for SPSS Release 2.16.1 *****************

        Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
   Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 8
    Y = GiftCard
    X = Hyperopi
    M = Justific
    W = RegretMa

Sample size
      552

**************************************************************************
Outcome: Justific

Model Summary
          R        R-sq        MSE          F         df1         df2          p
      .1450       .0210    19.3883     3.9220      3.0000    548.0000       .0087

Model
            coeff          se           t           p        LLCI        ULCI
constant   27.3976       .1874    146.1667       .0000     27.0294     27.7657
Hyperopi    -.7638       .3800     -2.0102       .0449     -1.5102      -.0174
RegretMa    -.7354       .3751     -1.9605       .0504     -1.4723       .0014
int_1      -1.5342       .7606     -2.0171       .0442     -3.0283      -.0402

Product terms key:

 int_1     Hyperopi     X      RegretMa

**************************************************************************
Outcome: GiftCard

Model Summary
          R        R-sq         MSE          F         df1         df2          p
```

```
        .5799        .3363       2.5778      69.2978       4.0000     547.0000         .0000

    Model
                     coeff          se           t           p         LLCI        ULCI
    constant        5.2628        .4322      12.1769        .0000       4.4138      6.1117
    Justific        -.2548        .0156     -16.3614        .0000       -.2854      -.2243
    Hyperopi        -.1527        .1391      -1.0983        .2725       -.4259       .1204
    RegretMa        -.0319        .1373       -.2324        .8163       -.3015       .2377
    int_2           .4003        .2784       1.4379        .1510       -.1465       .9470

    Product terms key:

     int_2    Hyperopi    X    RegretMa

    ******************** DIRECT AND INDIRECT EFFECTS ************************

    Conditional direct effect(s) of X on Y at values of the moderator(s):
       RegretMa      Effect          SE           t           p         LLCI        ULCI
        -.4819       -.3456        .1920      -1.8004        .0723       -.7227       .0315
         .5181        .0546        .2016        .2710        .7865       -.3414       .4507

    Conditional indirect effect(s) of X on Y at values of the moderator(s):

    Mediator
               RegretMa      Effect      Boot SE     BootLLCI     BootULCI
    Justific     -.4819        .0062        .1205       -.2335        .2390
    Justific      .5181        .3972        .1684        .0835        .7445

    -----
    Indirect effect of highest order product:

    Mediator
                 Effect     SE(Boot)     BootLLCI     BootULCI
    Justific      .3910        .2076       -.0100        .7988

    ******************** INDEX OF MODERATED MEDIATION ************************

    Mediator
                  Index     SE(Boot)     BootLLCI     BootULCI
    Justific      .3910        .2076       -.0100        .7988

    When the moderator is dichotomous, this is a test of equality of the
    conditional indirect effects in the two groups.

    ******************** ANALYSIS NOTES AND WARNINGS ************************

    Number of bootstrap samples for bias corrected bootstrap confidence
    intervals:
        5000

    Level of confidence for all confidence intervals in output:
        95.00

    NOTE: The following variables were mean centered prior to analysis:
     Hyperopi RegretMa

    ------ END MATRIX -----
```

**Appendix 6: Study 4 Materials**

**6.1 Limited-Time Scarcity Manipulation**

### MARKETING RESEARCH STUDY

**Unique opportunity, today only!** We were asked to conduct marketing research in Montreal with millennials for the Hershey Company for one of its Hershey's chocolates.

This market research takes place **today only** as a study in the MRP. This is a **rare chance** for your to try a product in the lab!

For this study, you will be sampling **Hershey's Hugs** candies, which are a combination of Hershey's milk chocolate hugged by sweet white cream.

You should not participate in this study if, for any reason (e.g., allergies, diet, etc.), you cannot eat the chocolate candies.

**Can you eat the chocolate candies?**

○ Yes
○ No

**6.2 Control Condition**

### MARKETING RESEARCH STUDY

We were asked to conduct marketing research in Montreal with millennials for the Hershey Company for one of its Hershey's chocolates.

For this study, you will be sampling **Hershey's Hugs** candies, which are a combination of Hershey's milk chocolate hugged by sweet white cream.

You should not participate in this study if, for any reason (e.g., allergies, diet, etc.), you cannot eat the chocolate candies.

**Can you eat the chocolate candies?**

○ Yes
○ No

# Appendix 7: Study 4 Output

## 7.1 Moderation Analysis (PROCESS Model 1); without covariate (mean-centered)

```
Run MATRIX procedure:

************** PROCESS Procedure for SPSS Release 2.16.1 ******************

          Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
     Documentation available in Hayes (2013). www.guilford.com/p/hayes3

***************************************************************************
Model = 1
    Y = ChocoEat
    X = Scarcity
    M = Hyperopi

Sample size
        66

***************************************************************************
Outcome: ChocoEat

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      .2586       .0669     2.2314     1.4808     3.0000    62.0000      .2285

Model
             coeff         se          t          p       LLCI       ULCI
constant    2.4630      .1849    13.3190      .0000     2.0934     2.8327
Hyperopi     .0131      .0264      .4941      .6230     -.0398      .0659
Scarcity     .6448      .3742     1.7231      .0898     -.1032     1.3929
int_1        .0620      .0517     1.1987      .2352     -.0414      .1654

Product terms key:

 int_1    Scarcity    X     Hyperopi

R-square increase due to interaction(s):
        R2-chng          F        df1        df2          p
int_1      .0216     1.4369     1.0000    62.0000      .2352

***************************************************************************

Conditional effect of X on Y at values of the moderator(s):
  Hyperopi     Effect         se          t          p       LLCI       ULCI
   -7.2281      .1967      .5311      .3705      .7123     -.8649     1.2584
     .0000      .6448      .3742     1.7231      .0898     -.1032     1.3929
    7.2281     1.0929      .5268     2.0747      .0422      .0399     2.1459

Values for quantitative moderators are the mean and plus/minus one SD from
mean.
Values for dichotomous moderators are the two values of the moderator.

******************** JOHNSON-NEYMAN TECHNIQUE *************************
```

```
Moderator value(s) defining Johnson-Neyman significance region(s)
      Value    % below    % above
     9.7001   92.4242     7.5758
     2.1658   68.1818    31.8182


Conditional effect of X on Y at values of the moderator (M)
   Hyperopi     Effect         se          t          p       LLCI       ULCI
  -14.0303     -.2249      .8191     -.2746      .7845    -1.8623     1.4124
  -12.2303     -.1134      .7375     -.1537      .8784    -1.5876     1.3609
  -10.4303     -.0018      .6590     -.0027      .9979    -1.3191     1.3156
   -8.6303      .1098      .5848      .1878      .8516    -1.0591     1.2788
   -6.8303      .2214      .5167      .4285      .6698     -.8114     1.2542
   -5.0303      .3330      .4575      .7279      .4694     -.5815     1.2475
   -3.2303      .4446      .4111     1.0816      .2836     -.3771     1.2663
   -1.4303      .5562      .3820     1.4557      .1505     -.2075     1.3199
     .3697      .6677      .3746     1.7828      .0795     -.0810     1.4165
    2.1658      .7791      .3897     1.9990      .0500      .0000     1.5582
    2.1697      .7793      .3898     1.9993      .0500      .0001     1.5585
    3.9697      .8909      .4254     2.0945      .0403      .0406     1.7412
    5.7697     1.0025      .4767     2.1030      .0395      .0496     1.9554
    7.5697     1.1141      .5394     2.0656      .0431      .0359     2.1922
    9.3697     1.2257      .6098     2.0099      .0488      .0067     2.4447
    9.7001     1.2462      .6234     1.9990      .0500      .0000     2.4923
   11.1697     1.3373      .6857     1.9502      .0557     -.0334     2.7080
   12.9697     1.4489      .7654     1.8929      .0630     -.0812     2.9789
   14.7697     1.5604      .8478     1.8405      .0705     -.1343     3.2552
   16.5697     1.6720      .9323     1.7935      .0778     -.1915     3.5356
   18.3697     1.7836     1.0182     1.7517      .0848     -.2518     3.8190
   20.1697     1.8952     1.1053     1.7146      .0914     -.3143     4.1047
   21.9697     2.0068     1.1933     1.6817      .0977     -.3786     4.3922


************************************************************************

Data for visualizing conditional effect of X on Y
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/Scarcity HyperopiaSum ChocoEaten_Diff.
BEGIN DATA.

     -.5758    -7.2281     2.2553
      .4242    -7.2281     2.4520
     -.5758      .0000     2.0918
      .4242      .0000     2.7366
     -.5758     7.2281     1.9282
      .4242     7.2281     3.0211

END DATA.
GRAPH/SCATTERPLOT=HyperopiaSum WITH ChocoEaten_Diff BY Scarcity.

******************** ANALYSIS NOTES AND WARNINGS ************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 Scarcity Hyperopi
------ END MATRIX -----
```

## 7.2 Moderation Analysis Output (PROCESS Model 1); Like Chocolate as covariate (mean-centered)

```
Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.1 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 1
    Y = ChocoEat
    X = Scarcity
    M = Hyperopi

Statistical Controls:
CONTROL= LikeChoc

Sample size
        66

**************************************************************************
Outcome: ChocoEat

Model Summary
          R       R-sq       MSE          F        df1        df2          p
      .3217      .1035     2.1789     1.7607     4.0000    61.0000      .1484

Model
              coeff        se          t          p       LLCI       ULCI
constant     1.3704      .7156     1.9149      .0602     -.0606     2.8014
Hyperopi      .0161      .0262      .6135      .5418     -.0363      .0685
Scarcity      .7296      .3737     1.9526      .0555     -.0176     1.4768
int_1         .0577      .0512     1.1281      .2637     -.0446      .1601
LikeChoc      .2697      .1708     1.5791      .1195     -.0718      .6112

Product terms key:

 int_1    Scarcity    X      Hyperopi

R-square increase due to interaction(s):
        R2-chng          F        df1        df2          p
int_1      .0187     1.2726     1.0000    61.0000      .2637

**************************************************************************

Conditional effect of X on Y at values of the moderator(s):
   Hyperopi     Effect         se          t          p       LLCI       ULCI
    -7.2281      .3123      .5299      .5895      .5577     -.7472     1.3719
      .0000      .7296      .3737     1.9526      .0555     -.0176     1.4768
     7.2281     1.1469      .5217     2.1985      .0317      .1038     2.1900

Values for quantitative moderators are the mean and plus/minus one SD from
mean.
```

Values for dichotomous moderators are the two values of the moderator.

********************** JOHNSON-NEYMAN TECHNIQUE **************************

Moderator value(s) defining Johnson-Neyman significance region(s)
     Value    % below   % above
   11.8276   95.4545    4.5455
    .3076   53.0303   46.9697

Conditional effect of X on Y at values of the moderator (M)

| Hyperopi | Effect | se | t | p | LLCI | ULCI |
|---|---|---|---|---|---|---|
| -14.0303 | -.0804 | .8146 | -.0986 | .9217 | -1.7092 | 1.5485 |
| -12.2303 | .0236 | .7339 | .0321 | .9745 | -1.4440 | 1.4912 |
| -10.4303 | .1275 | .6563 | .1942 | .8466 | -1.1849 | 1.4399 |
| -8.6303 | .2314 | .5830 | .3969 | .6928 | -.9343 | 1.3971 |
| -6.8303 | .3353 | .5156 | .6503 | .5180 | -.6958 | 1.3664 |
| -5.0303 | .4392 | .4571 | .9610 | .3404 | -.4747 | 1.3532 |
| -3.2303 | .5431 | .4110 | 1.3216 | .1912 | -.2786 | 1.3649 |
| -1.4303 | .6470 | .3819 | 1.6943 | .0953 | -.1166 | 1.4107 |
| .3076 | .7474 | .3738 | 1.9996 | .0500 | .0000 | 1.4947 |
| .3697 | .7510 | .3739 | 2.0087 | .0490 | .0034 | 1.4985 |
| 2.1697 | .8549 | .3881 | 2.2024 | .0314 | .0787 | 1.6310 |
| 3.9697 | .9588 | .4225 | 2.2692 | .0268 | .1139 | 1.8037 |
| 5.7697 | 1.0627 | .4726 | 2.2486 | .0282 | .1177 | 2.0077 |
| 7.5697 | 1.1666 | .5340 | 2.1846 | .0328 | .0988 | 2.2344 |
| 9.3697 | 1.2705 | .6033 | 2.1060 | .0393 | .0642 | 2.4768 |
| 11.1697 | 1.3744 | .6780 | 2.0272 | .0470 | .0187 | 2.7302 |
| 11.8276 | 1.4124 | .7063 | 1.9996 | .0500 | .0000 | 2.8248 |
| 12.9697 | 1.4783 | .7566 | 1.9540 | .0553 | -.0345 | 2.9912 |
| 14.7697 | 1.5823 | .8379 | 1.8884 | .0637 | -.0932 | 3.2578 |
| 16.5697 | 1.6862 | .9213 | 1.8303 | .0721 | -.1560 | 3.5284 |
| 18.3697 | 1.7901 | 1.0062 | 1.7791 | .0802 | -.2219 | 3.8020 |
| 20.1697 | 1.8940 | 1.0922 | 1.7341 | .0880 | -.2900 | 4.0780 |
| 21.9697 | 1.9979 | 1.1792 | 1.6943 | .0953 | -.3601 | 4.3559 |

****************************************************************************

Data for visualizing conditional effect of X on Y
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/Scarcity HyperopiaSum ChocoEaten_Diff.
BEGIN DATA.

    -.5758    -7.2281    2.1654
     .4242    -7.2281    2.4777
    -.5758     .0000    2.0413
     .4242     .0000    2.7709
    -.5758    7.2281    1.9173
     .4242    7.2281    3.0641

END DATA.
GRAPH/SCATTERPLOT=HyperopiaSum WITH ChocoEaten_Diff BY Scarcity.

* Estimates are based on setting covariates to their sample means.

******************* ANALYSIS NOTES AND WARNINGS ************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 Scarcity Hyperopi

------ END MATRIX -----

**Appendix 8: Study 5 Materials**

## 8.1 Attention Check (IMC)

How is your mood right now? Although we would like to know how you are feeling, please select nine so we know you are paying attention.

| Very Unpleasant | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Very Pleasant |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## 8.2 Treatment (LQS) and Control Stimuli

# Appendix 9: Study 5 Output

## 9.1 Moderation Model (PROCESS Model 1; mean-centered)

```
Run MATRIX procedure:

************** PROCESS Procedure for SPSS Version 3.2.03 ****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
     Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 1
    Y  : Massage_
    X  : Scarci_1
    W  : SumHyper

Sample
Size:  251


**************************************************************************
OUTCOME VARIABLE:
 Massage_

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1957      .0383     3.7554     3.2780     3.0000   247.0000      .0217

Model
             coeff         se          t          p       LLCI       ULCI
constant    4.4241      .1242    35.6166      .0000     4.1795     4.6688
Scarci_1    -.4587      .2484    -1.8465      .0660     -.9480      .0306
SumHyper    -.0105      .0159     -.6569      .5119     -.0418      .0209
Int_1        .0675      .0317     2.1278      .0343      .0050      .1301

Product terms key:
 Int_1    :        Scarci_1 x       SumHyper

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0176     4.5274     1.0000   247.0000      .0343
----------
    Focal predict: Scarci_1 (X)
         Mod var: SumHyper (W)

Conditional effects of the focal predictor at values of the moderator(s):

   SumHyper     Effect         se          t          p       LLCI       ULCI
    -8.0058     -.9994      .3613    -2.7664      .0061    -1.7110     -.2879
      .0000     -.4587      .2484    -1.8465      .0660     -.9480      .0306
     8.0058      .0820      .3494      .2347      .8147     -.6062      .7702


Moderator value(s) defining Johnson-Neyman significance region(s):
       Value    % below    % above
      -.4816    47.4104    52.5896
```

```
Conditional effect of focal predictor at values of the moderator:
   SumHyper     Effect         se          t          p       LLCI       ULCI
  -17.6932    -1.6537      .6217    -2.6601      .0083    -2.8781     -.4293
  -15.9932    -1.5389      .5726    -2.6875      .0077    -2.6667     -.4111
  -14.2932    -1.4241      .5245    -2.7151      .0071    -2.4571     -.3910
  -12.5932    -1.3093      .4776    -2.7410      .0066    -2.2500     -.3685
  -10.8932    -1.1944      .4325    -2.7619      .0062    -2.0462     -.3427
   -9.1932    -1.0796      .3895    -2.7717      .0060    -1.8468     -.3124
   -7.4932     -.9648      .3496    -2.7595      .0062    -1.6534     -.2762
   -5.7932     -.8500      .3140    -2.7071      .0073    -1.4684     -.2315
   -4.0932     -.7352      .2842    -2.5870      .0103    -1.2949     -.1754
   -2.3932     -.6204      .2622    -2.3659      .0188    -1.1368     -.1039
    -.6932     -.5055      .2501    -2.0211      .0444     -.9982     -.0129
    -.4816     -.4912      .2494    -1.9696      .0500     -.9825      .0000
   1.0068     -.3907      .2494    -1.5665      .1185     -.8820      .1005
   2.7068     -.2759      .2601    -1.0606      .2899     -.7883      .2365
   4.4068     -.1611      .2810     -.5733      .5670     -.7145      .3924
   6.1068     -.0463      .3100     -.1493      .8815     -.6568      .5642
   7.8068      .0685      .3450      .1987      .8427     -.6109      .7480
   9.5068      .1834      .3844      .4770      .6338     -.5738      .9405
  11.2068      .2982      .4270      .6983      .4857     -.5429     1.1392
  12.9068      .4130      .4720      .8751      .3824     -.5166     1.3426
  14.6068      .5278      .5186     1.0177      .3098     -.4937     1.5493
  16.3068      .6426      .5666     1.1342      .2578     -.4733     1.7586

*********************** ANALYSIS NOTES AND ERRORS ***********************


Level of confidence for all confidence intervals in output:
  95.0000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: The following variables were mean centered prior to analysis:
        SumHyper Scarci_1

NOTE: Variables names longer than eight characters can produce incorrect
output.
        Shorter variable names are recommended.

------ END MATRIX -----
```

## 9.2 Moderation Analysis (PROCESS Model 3; mean-centered)

```
Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.1 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
     Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 3
    Y = Massage_
    X = Scarci_1
    M = SumHyper
    W = Hyperopi

Sample size
       251


**************************************************************************
Outcome: Massage_

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      .2593       .0672      3.7024      2.5017      7.0000    243.0000       .0169

Model
            coeff          se           t           p        LLCI        ULCI
constant    4.3959       .1254      35.0489       .0000      4.1488      4.6429
SumHyper    -.0107       .0162       -.6589       .5106      -.0426       .0212
Scarci_1    -.4298       .2509      -1.7131       .0880      -.9240       .0644
int_1        .0817       .0323       2.5273       .0121       .0180       .1454
Hyperopi     .4926       .2510       1.9621       .0509      -.0019       .9871
int_2       -.3702       .5022       -.7371       .4617     -1.3595       .6191
int_3        .0457       .0323       1.4142       .1586      -.0180       .1094
int_4        .0655       .0645       1.0156       .3108      -.0615       .1925


Product terms key:

 int_1     Scarci_1     X      SumHyper
 int_2     Scarci_1     X      Hyperopi
 int_3     SumHyper     X      Hyperopi
 int_4     Scarci_1     X      SumHyper    X      Hyperopi


R-square increase due to three-way interaction:
        R2-chng    F(1,df2)        df2           p
int_4      .0040      1.0315    243.0000       .3108


**************************************************************************


Conditional effect of X on Y at values of the moderator(s):
   Hyperopi   SumHyper      Effect          se           t           p        LLCI
ULCI
     -.5139     -8.0058      -.6241       .4726     -1.3205       .1879     -1.5550
.3068
```

```
    -.5139      .0000     -.2395      .3633     -.6593      .5103     -.9551
.4760
    -.5139     8.0058      .1450      .5357      .2707      .7868     -.9102
1.2003
     .4861    -8.0058    -1.5186      .5556    -2.7334      .0067    -2.6130
-.4243
     .4861      .0000     -.6097      .3468    -1.7582      .0800    -1.2928
.0734
     .4861     8.0058      .2992      .4675      .6400      .5228     -.6217
1.2200
```

Values for quantitative moderators are the mean and plus/minus one SD from mean.
Values for dichotomous moderators are the two values of the moderator.

Conditional effect of X*M interaction at values of W:
```
  Hyperopi    Effect        se         t          p       LLCI       ULCI
    -.5139      .0480      .0438     1.0955      .2744     -.0383      .1344
     .4861      .1135      .0473     2.4007      .0171      .0204      .2067
```

*************************************************************************

Data for visualizing conditional effect of X on Y
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/ScarcityLQS HyperopiaSecond SumHyperopia Massage_PI.
BEGIN DATA.

```
    -.5060     -.5139    -8.0058      4.7320
     .4940     -.5139    -8.0058      4.1080
    -.5060     -.5139      .0000      4.2639
     .4940     -.5139      .0000      4.0244
    -.5060     -.5139     8.0058      3.7957
     .4940     -.5139     8.0058      3.9408
    -.5060      .4861    -8.0058      5.3112
     .4940      .4861    -8.0058      3.7926
    -.5060      .4861      .0000      4.9438
     .4940      .4861      .0000      4.3341
    -.5060      .4861     8.0058      4.5763
     .4940      .4861     8.0058      4.8755
```

END DATA.
GRAPH/SCATTERPLOT=SumHyperopia WITH Massage_PI BY ScarcityLQS/PANEL
ROWVAR=HyperopiaSecond.

******************** ANALYSIS NOTES AND WARNINGS ************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 Scarci_1 SumHyper Hyperopi

NOTE: The Johnson-Neyman method cannot be used with a dichotomous moderator

------ END MATRIX -----

### 9.3 Moderation Analysis (PROCESS Model 1) with Like Chocolate as covariate (mean-centered)

```
************* PROCESS Procedure for SPSS Release 2.16.1 ******************

          Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3


*************************************************************************
Model = 1
    Y = Smarties
    X = Scarcity
    M = SumHyper

Statistical Controls:
CONTROL= LikeChoc

Sample size
        76


*************************************************************************
Outcome: Smarties

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      .1605       .0257   319.3300      .4691     4.0000    71.0000      .7582

Model
            coeff         se          t          p       LLCI       ULCI
constant  27.0617     9.6412     2.8069      .0065     7.8375    46.2858
SumHyper   -.2517      .2882     -.8733      .3854     -.8263      .3230
Scarcity   2.8073     4.1019      .6844      .4960    -5.3717    10.9864
int_1       .3798      .5732      .6626      .5097     -.7631     1.5227
LikeChoc   -.6536     2.2373     -.2922      .7710    -5.1147     3.8075


Product terms key:

 int_1    Scarcity    X    SumHyper

R-square increase due to interaction(s):
        R2-chng          F        df1        df2          p
int_1      .0060      .4391     1.0000    71.0000      .5097


*************************************************************************

Conditional effect of X on Y at values of the moderator(s):
   SumHyper     Effect         se          t          p       LLCI       ULCI
    -7.2478      .0547     5.8346      .0094      .9926   -11.5792    11.6885
      .0000     2.8073     4.1019      .6844      .4960    -5.3717    10.9864
     7.2478     5.5600     5.8415      .9518      .3444    -6.0877    17.2078

Values for quantitative moderators are the mean and plus/minus one SD from
mean.
Values for dichotomous moderators are the two values of the moderator.
```

```
********************* JOHNSON-NEYMAN TECHNIQUE **************************

There are no statistical significance transition points within the observed
range of the moderator.

******************** ANALYSIS NOTES AND WARNINGS ************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 Scarcity SumHyper

------ END MATRIX -----
```

# Appendix 10: Study 6 Materials

## 10.1 Limited-Time Scarcity Manipulation

### MARKET RESEARCH STUDY

**Unique opportunity, today only!** We were asked to conduct market research in Montreal with millennials for the Nestlé company for its **limited edition Spring Smarties.**

This market research takes place **today only** as a study in the MRP. This is a **rare chance** for you to try this product in the lab!

For this study, you will be sampling **Spring-themed Smarties**, a deliciously decadent chocolate treat wrapped in a pastel-coloured coating.

You should not participate in this study if, for any reason (e.g., allergies, diet, etc.), you cannot eat the chocolate candies.

Ingredients: Milk, sugar, cocoa, soy, wheat flour, corn starch

**Can you eat the chocolate candies?**

○ Yes

○ No

## 10.2 Control

### MARKET RESEARCH STUDY

**As part of an ongoing research program,** we were asked to conduct market research in Montreal with millennials for the Nestlé company for its **Spring-themed Smarties.**

For this study, you will be sampling **Spring-themed Smarties**, a deliciously decadent chocolate treat wrapped in a pastel-coloured coating.

You should not participate in this study if, for any reason (e.g., allergies, diet, etc.), you cannot eat the chocolate candies.

Ingredients: Milk, sugar, cocoa, soy, wheat flour, corn starch

**Can you eat the chocolate candies?**

○ Yes

○ No

## 10.3 Categorization Task

### PRODUCT CATEGORIZATION STUDY

**Using the list and two columns below, please drag and drop each item in the column you feel it belongs to the most.**

Try to categorize the items based on your own personal preferences, as there are no right or wrong answers. You can put **as many or as little items in each category** as you deemed appropriate.

Note that the **rank of each item** (e.g., 1, 2, 3, etc.) in each category **does not matter**, as we are interested in better understanding what products consumers perceive to be necessities or luxuries.

Items

Pizza

Athletic shoes

Movie

Restaurant dinner

Oil change

Backpack

Laptop

Groceries

Cell phone

Trip to Mexico

Downloaded song

Haircut

Concert

Designer jeans

Interview suit

Batteries

Home theater system

iPad

Massage

Textbook

| Necessities | Luxuries |
| --- | --- |
| | |

# Appendix 11: Study 6 Output

## 11.1 Moderation Analysis (PROCESS Model 1); no covariate (mean-centered)

```
************* PROCESS Procedure for SPSS Release 2.16.1 ******************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
     Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 1
    Y = Smarties
    X = Scarcity
    M = SumHyper

Sample size
        76

**************************************************************************
Outcome: Smarties

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1568      .0246   315.2734      .6047     3.0000    72.0000      .6141

Model
              coeff         se          t          p       LLCI       ULCI
constant    24.3093     2.0370    11.9341      .0000    20.2487    28.3700
SumHyper     -.2427      .2847     -.8524      .3968     -.8103      .3249
Scarcity     2.8436     4.0739      .6980      .4874    -5.2776    10.9649
int_1         .3772      .5694      .6625      .5098     -.7579     1.5124

Product terms key:

 int_1     Scarcity     X      SumHyper

R-square increase due to interaction(s):
        R2-chng          F        df1        df2          p
int_1      .0059      .4389     1.0000    72.0000      .5098


**************************************************************************

Conditional effect of X on Y at values of the moderator(s):
   SumHyper     Effect         se          t          p       LLCI       ULCI
    -7.2478      .1095     5.7944      .0189      .9850   -11.4415    11.6604
      .0000     2.8436     4.0739      .6980      .4874    -5.2776    10.9649
     7.2478     5.5778     5.8040      .9610      .3398    -5.9923    17.1479

Values for quantitative moderators are the mean and plus/minus one SD from
mean.
Values for dichotomous moderators are the two values of the moderator.

******************** JOHNSON-NEYMAN TECHNIQUE *************************

There are no statistical significance transition points within the observed
```

range of the moderator.

******************** ANALYSIS NOTES AND WARNINGS ************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 Scarcity SumHyper

------ END MATRIX -----

## 11.2 Moderation Analysis (PROCESS Model 1); Like Chocolate as covariate (mean-centered)

************* PROCESS Procedure for SPSS Release 2.16.1 *****************

          Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 1
    Y = Smarties
    X = Scarcity
    M = SumHyper

Statistical Controls:
CONTROL= LikeChoc

Sample size
        76

**************************************************************************
Outcome: Smarties

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1605      .0257   319.3300      .4691     4.0000    71.0000      .7582

Model
              coeff         se          t          p       LLCI       ULCI
constant    27.0617     9.6412     2.8069      .0065     7.8375    46.2858
SumHyper     -.2517      .2882     -.8733      .3854     -.8263      .3230
Scarcity     2.8073     4.1019      .6844      .4960    -5.3717    10.9864
int_1         .3798      .5732      .6626      .5097     -.7631     1.5227
LikeChoc     -.6536     2.2373     -.2922      .7710    -5.1147     3.8075

Product terms key:

 int_1    Scarcity    X      SumHyper

R-square increase due to interaction(s):
        R2-chng          F        df1        df2          p
int_1      .0060      .4391     1.0000    71.0000      .5097

```
**********************************************************************

Conditional effect of X on Y at values of the moderator(s):
   SumHyper     Effect          se           t           p        LLCI        ULCI
    -7.2478      .0547      5.8346       .0094       .9926    -11.5792     11.6885
      .0000     2.8073      4.1019       .6844       .4960     -5.3717     10.9864
     7.2478     5.5600      5.8415       .9518       .3444     -6.0877     17.2078

Values for quantitative moderators are the mean and plus/minus one SD from
mean.
Values for dichotomous moderators are the two values of the moderator.

******************** JOHNSON-NEYMAN TECHNIQUE *************************

There are no statistical significance transition points within the observed
range of the moderator.

******************** ANALYSIS NOTES AND WARNINGS *********************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 Scarcity SumHyper

------ END MATRIX -----
```

# Appendix 12: Study 6 Output

## 12.1 ANOVA on Amount of Smarties Eaten

**Between-Subjects Factors**

| | | Value Label | N |
|---|---|---|---|
| Hyperopia | 0 | Control | 76 |
| | 1 | Hyperopia manip | 73 |
| Scarcity | 0 | Control | 75 |
| | 1 | Limited-time | 74 |

**Descriptive Statistics**

Dependent Variable: Smartieseaten

| Hyperopia | Scarcity | Mean | Std. Deviation | N |
|---|---|---|---|---|
| Control | Control | 22.84 | 18.044 | 38 |
| | Limited-time | 25.74 | 17.293 | 38 |
| | Total | 24.29 | 17.615 | 76 |
| Hyperopia manip | Control | 18.43 | 16.643 | 37 |
| | Limited-time | 15.72 | 16.281 | 36 |
| | Total | 17.10 | 16.407 | 73 |
| Total | Control | 20.67 | 17.392 | 75 |
| | Limited-time | 20.86 | 17.437 | 74 |
| | Total | 20.77 | 17.356 | 149 |

**Tests of Between-Subjects Effects**

Dependent Variable: Smartieseaten

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 2220.054[a] | 3 | 740.018 | 2.533 | .059 |
| Intercept | 63710.716 | 1 | 63710.716 | 218.081 | .000 |
| Hyperopia | 1936.590 | 1 | 1936.590 | 6.629 | .011 |
| Scarcity | .317 | 1 | .317 | .001 | .974 |
| Hyperopia * Scarcity | 292.410 | 1 | 292.410 | 1.001 | .319 |
| Error | 42360.724 | 145 | 292.143 | | |
| Total | 108828.000 | 149 | | | |
| Corrected Total | 44580.779 | 148 | | | |

a. R Squared = .050 (Adjusted R Squared = .030)

## Pairwise Comparisons

Dependent Variable:   Smartieseaten

| Scarcity | (I) Hyperopia | (J) Hyperopia | Mean Difference (I-J) | Std. Error | Sig.b | 95% Confidence Interval for Differenceb | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Control | Control | Hyperopia manip | 4.410 | 3.948 | .266 | -3.393 | 12.212 |
| | Hyperopia manip | Control | -4.410 | 3.948 | .266 | -12.212 | 3.393 |
| Limited-time | Control | Hyperopia manip | 10.015* | 3.975 | .013 | 2.158 | 17.872 |
| | Hyperopia manip | Control | -10.015* | 3.975 | .013 | -17.872 | -2.158 |

Based on estimated marginal means

*. The mean difference is significant at the .050 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

## 12.2 ANOVA on Justification

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Hyperopia | 0 | Control | 76 |
| | 1 | Hyperopia manip | 73 |
| Scarcity | 0 | Control | 75 |
| | 1 | Limited-time | 74 |

### Descriptive Statistics

Dependent Variable:   JustificationScale

| Hyperopia | Scarcity | Mean | Std. Deviation | N |
|---|---|---|---|---|
| Control | Control | 21.47 | 6.853 | 38 |
| | Limited-time | 18.95 | 8.246 | 38 |
| | Total | 20.21 | 7.637 | 76 |
| Hyperopia manip | Control | 20.38 | 7.017 | 37 |
| | Limited-time | 21.33 | 7.783 | 36 |
| | Total | 20.85 | 7.369 | 73 |
| Total | Control | 20.93 | 6.909 | 75 |
| | Limited-time | 20.11 | 8.059 | 74 |
| | Total | 20.52 | 7.488 | 149 |

## Tests of Between-Subjects Effects

Dependent Variable: JustificationScale

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 153.097[a] | 3 | 51.032 | .908 | .439 |
| Intercept | 62788.701 | 1 | 62788.701 | 1117.638 | .000 |
| Hyperopia | 15.505 | 1 | 15.505 | .276 | .600 |
| Scarcity | 22.983 | 1 | 22.983 | .409 | .523 |
| Hyperopia * Scarcity | 112.804 | 1 | 112.804 | 2.008 | .159 |
| Error | 8146.071 | 145 | 56.180 | | |
| Total | 71060.000 | 149 | | | |
| Corrected Total | 8299.168 | 148 | | | |

a. R Squared = .018 (Adjusted R Squared = -.002)

## Pairwise Comparisons

Dependent Variable: JustificationScale

| Scarcity | (I) Hyperopia | (J) Hyperopia | Mean Difference (I-J) | Std. Error | Sig.[a] | 95% Confidence Interval for Difference[a] | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Control | Control | Hyperopia manip | 1.095 | 1.731 | .528 | -2.326 | 4.517 |
| | Hyperopia manip | Control | -1.095 | 1.731 | .528 | -4.517 | 2.326 |
| Limited-time | Control | Hyperopia manip | -2.386 | 1.743 | .173 | -5.831 | 1.060 |
| | Hyperopia manip | Control | 2.386 | 1.743 | .173 | -1.060 | 5.831 |

Based on estimated marginal means

a. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

## 12.3 Moderated Mediation Analysis (mean-centered)

```
Run MATRIX procedure:

************** PROCESS Procedure for SPSS Version 3.2.03 *****************

          Written by Andrew F. Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3


*************************************************************************
Model  : 8
    Y  : Smarties
    X  : Scarcity
    M  : Justific
    W  : Hyperopi

Sample
Size:  149
```

```
**************************************************************************
OUTCOME VARIABLE:
 Justific

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      .1358       .0184    56.1798      .9084     3.0000   145.0000      .4387

Model
              coeff         se          t          p        LLCI        ULCI
constant    20.5294      .6141    33.4326      .0000    19.3158    21.7431
Scarcity     -.8207     1.2281     -.6683      .5050    -3.2481     1.6066
Hyperopi      .6336     1.2284      .5158      .6067    -1.7942     3.0615
Int_1        3.4813     2.4568     1.4170      .1586    -1.3745     8.3370

Product terms key:
 Int_1    :       Scarcity x       Hyperopi

Test(s) of highest order unconditional interaction(s):
      R2-chng          F        df1        df2          p
X*W       .0136     2.0079     1.0000   145.0000      .1586

**************************************************************************
OUTCOME VARIABLE:
 Smarties

Model Summary
          R        R-sq        MSE          F        df1        df2          p
      .2601       .0676   288.6483     2.6117     4.0000   144.0000      .0379

Model
              coeff         se          t          p        LLCI        ULCI
constant    27.1703     4.1075     6.6149      .0000    19.0516    35.2891
Scarcity     -.1078     2.7881     -.0387      .9692    -5.6187     5.4031
Justific     -.3125      .1882    -1.6600      .0991     -.6845      .0596
Hyperopi    -6.9953     2.7869    -2.5101      .0132   -12.5038    -1.4869
Int_1       -4.5172     5.6072     -.8056      .4218   -15.6002     6.5659

Product terms key:
 Int_1    :       Scarcity x       Hyperopi

Test(s) of highest order unconditional interaction(s):
      R2-chng          F        df1        df2          p
X*W       .0042      .6490     1.0000   144.0000      .4218

***************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Conditional direct effect(s) of X on Y:
  Hyperopi     Effect         se          t          p        LLCI        ULCI
    -.4899     2.1053     3.9266      .5362      .5927     -5.6559     9.8666
     .5101    -2.4118     3.9814     -.6058      .5456    -10.2814     5.4577

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
 Scarcity    ->    Justific    ->    Smarties
```

```
   Hyperopi     Effect     BootSE    BootLLCI    BootULCI
    -.4899       .7894      .8153     -.2698      2.8764
     .5101      -.2984      .6597    -1.8648       .8679


Index of moderated mediation (difference between conditional indirect
effects):
              Index      BootSE    BootLLCI    BootULCI
Hyperopi    -1.0878      1.1513    -3.9594       .3944
---

********************* ANALYSIS NOTES AND ERRORS ***********************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

NOTE: The following variables were mean centered prior to analysis:
        Hyperopi Scarcity

NOTE: Variables names longer than eight characters can produce incorrect
output.
      Shorter variable names are recommended.

------ END MATRIX -----
```