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Signature:

_____ _____

Deidre L. Popovich Date

The Influence of Contextual Decision-Making on Consumer Self-Control

By

Deidre L. Popovich
Doctor of Philosophy

Business

_____
Ryan Hamilton, Ph.D.
Advisor

_____
Lawrence Barsalou, Ph.D.
Committee Member

_____
Melissa Williams, Ph.D.
Committee Member

_____
Dawn Iacobucci, Ph.D.
Committee Member

Accepted:

_____
Lisa A. Tedesco, Ph.D.
Dean of the James T. Laney School of Graduate Studies

_____
Date

The Influence of Contextual Decision-Making on Consumer Self-Control

By

Deidre L. Popovich
B.A., Western Michigan University, 1997
M.A., Michigan State University, 2000
M.B.A., Vanderbilt University, 2008

Advisor: Ryan Hamilton, Ph.D.

An abstract of
A dissertation submitted to the Faculty of the
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Abstract

The Influence of Contextual Decision-Making on Consumer Self-Control
By Deidre L. Popovich

Self-control has been widely studied as an important mechanism for achieving goals and avoiding regret. To date, it has been examined primarily as a personality trait or as a resource that impacts all decisions relatively equally. Common life events suggest that the context of consumer decision making can play a large role in how and when self-control can be exercised more or less effectively. This dissertation examines three distinct contexts that involve consumers using wish lists when shopping, evaluating calorie information when dining out, and pursuing self-improvement goals in a social context. Each of these studies demonstrates certain situational factors surrounding the decision that can have an ironic effect on judgments with important implications for self-control. The first essay examines the use of wish lists to defer potential purchases. Many online retailers enable consumers to postpone a purchase by placing a desired item onto a wish list. Goal-directed choice theory predicts that deferring a purchase in such a manner should increase the desire to acquire the item. In contrast, this research demonstrates that using a wish list can lead to decreased purchase intent for the wish-listed products. The second essay focuses on how calorie evaluation can impact perceptions of food healthiness. Legislation and common wisdom suggest that as people become more exposed to calorie information, they should become more confident in their ability to judge the healthiness of food items. In contrast, this research demonstrates that evaluating calories can lead to decreased confidence and more moderate judgments of the healthiness of food items. The third essay examines the potential drawbacks of pursuing goals in a social context. Social influence is commonly presumed to facilitate goal pursuit, but social comparisons and other mechanisms may sometimes hinder, rather than facilitate, people reaching their goals. Taken together, these three essays contribute to the understanding of consumer decision theory and multi-stage decision making with important implications for self-control.

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CHAPTER 1

INTRODUCTION

Self-control has been widely studied as an important mechanism for achieving goals and avoiding regret (Duckworth, Peterson, Matthews, and Kelly 2007; Mischel, Shoda, and Rodriguez 1989). To date, it has been examined primarily as a personality trait or as a resource that impacts all decisions relatively equally (Baumeister, Vohs, and Tice 2007; Job, Dweck, and Walton 2010; Kaplan and Berman 2010). This internal, resource-based perspective has advanced our knowledge of how people can generally improve their limited self-regulatory strength or willpower.

From a psychological standpoint, self-control has been shown to have important implications for emotions, behaviors, and motivations. For example, self-regulatory strength and willpower have been characterized as internal resources that can become depleted with effortful choice (Baumeister, Sparks, Stillman, and Vohs 2008). Self-control has been compared to physical strength in the sense that both are a limited resource that can become weakened when overused (Baumeister, Vohs, and Tice 2007). When the self-control resource becomes depleted, the ability to exercise rational choice can become weakened (Baumeister et al. 1998, Vohs and Heatherton 2000). Popular theories of self-control suggest that self-control plays an important role in resisting temptations and exercising discipline (Hoch and Loewenstein 1991).

Self-control seems to have an emotional dimension as well. Forecasting emotional outcomes that may result from either resisting or giving in to temptation can have an

impact on self-regulatory resources (MacInnis and Patrick 2006; Patrick, Chun, and MacInnis 2009). Further, moods can influence choices, including food choice (Gardner, Wansink, Kim, and Park 2014). Consumers often trade-off immediate goals, such as saving money, with future goals, such as maintaining their health (Haws and Winterich 2013). Exerting self-control can also lead people to exhibit greater anger and irritation (Gal and Liu 2011).

When consumers are "low" on self-control, they have been shown to engage in overeating, impulsive spending, and other excessive behaviors (Hofmann, Strack, and Deutsch 2008). When employees are stressed out, they are less likely to exercise self-control in difficult customer encounters and less likely to deliver good customer service (Chan and Wan 2012).

In contrast to studying self-control with an internal, resource-based approach, this dissertation examines the decision context in which people make choices and proposes that there are often situational factors that can also influence self-control. In particular, common life events suggest that the external context in which consumers make decisions may also play a large role in how and when self-control can be exercised more or less effectively. For instance, the way that information is presented or the order in which consumers view certain pieces of information can alter their choices (Bettman, Luce, and Payne 1998; Dhar 1997; Shafir 1993), thus leading to differences in enacting self-control as a function of the decision environment itself.

Background

Despite the existing body of knowledge surrounding antecedents and consequences of self-control, much less is known about specific attributes inherent to

decision contexts that can impact multi-stage consumer judgments. My dissertation aims to address this gap in the existing literature by examining contextual factors that play an important role in how consumers can improve their self-control. This research contributes to our understanding of the types of information that can influence consumer decisions while also having important self-regulatory implications across multiple domains.

Research Objectives

This dissertation examines three distinct contexts that involve consumers using wish lists when shopping (essay 1), evaluating calorie information when dining out (essay 2), and pursuing self-improvement goals in a social context (essay 3). Each of these studies demonstrates certain situational factors surrounding the decision that can have an ironic effect on decisions with important implications for self-control.

The first essay examines the use of wish lists to defer potential purchases. Many online retailers enable consumers to postpone a purchase by placing a desired item onto a wish list. Goal-directed choice theory predicts that deferring a purchase in such a manner should increase the desire to acquire the item. In contrast, this research demonstrates that using a wish list can lead to decreased purchase intent for the wish-listed products.

The second essay focuses on how calorie evaluation can impact perceptions of food healthiness. Legislation and common wisdom suggest that as people become more exposed to calorie information, they should become more confident in their ability to judge the healthiness of food items. In contrast, this research demonstrates that evaluating calories can lead to decreased confidence and more moderate judgments of the healthiness of food items.

The third essay examines the potential drawbacks of pursuing goals in a social context. Social influence is commonly presumed to facilitate goal pursuit, but social comparisons and other mechanisms may sometimes hinder, rather than facilitate, people reaching their goals.

Taken together, these three essays contribute to the understanding of consumer decision theory and multi-stage decision making with important implications for self-control. This dissertation makes theoretical contributions to the areas of consumer decision-making, choice theory, and how preferences are constructed from the decision environment. The implications from these studies are also of importance to consumers and marketing practitioners, by enhancing the knowledge of decision-making tools that people can use to improve their self-control while shopping, eating, and pursuing self-improvement goals.

CHAPTER 2

ESSAY 1: THE DESIRE TO ACQUIRE WISH LIST ITEMS

Abstract

Many online retailers enable consumers to postpone a purchase by placing a desired item onto a wish list. Goal-directed choice theory predicts that deferring a purchase in such a manner should increase the desire to acquire the item. In contrast, this research demonstrates that using a wish list can lead to decreased purchase intent for the wish-listed products. We account for these findings by proposing that the use of a wish list effectively partitions a unitary purchase decision into a two-stage choice, in which consumers give differential weighting to desirability and feasibility attributes at each stage. Data obtained from six experiments lend support for the theory and empirical predictions advanced in this paper.

Introduction

Consumers have always had the ability to defer certain purchases, but doing so has gotten easier over time. Retailers and third parties have begun providing "wish list" tools and similar devices to facilitate consumers' tracking of items they would like to obtain, either as a gift from someone else, or as a purchase they would like to make for themselves at some point in the future. Most major retailers, including Amazon, Target, and Barnes and Noble, have a wish list option integrated into their websites, which gives consumers the ability to save products for future consideration. Social media websites

such as Pinterest allow consumers to save project ideas and potential product purchases across retailers. Even Facebook tested a "Want" button for products, similar to its existing "Like" button (Darwell 2012).

Wish list usage is becoming increasingly popular while shopping online, and formalized wish lists are only one ways of delaying a purchase. Consumers can create their own document lists to track potential purchases. Personal organization software services allow consumers to maintain these lists across platforms and devices. Consumers can even defer potential purchases by using a shopping cart as an online holding area, or by placing items onto a saved for later list.

From the merchants' perspective, wish lists allow shoppers who do not make an initial purchase to do so sometime in the future (Close and Kukar-Kinney 2010). One of the reasons that retailers offer consumers tools such as wish lists is to try to avoid lost sales from abandoned shopping carts (Kukar-Kinney and Close 2010). In this context, wish lists can be viewed as a strategy for increasing sales over time, by facilitating the reevaluation of options that consumers consider desirable, but which they are unwilling or unable to purchase at the moment. The hope seems to be that encouraging consumers to reconsider attractive items will eventually lead to increased sales. And this managerial intuition would seem to be supported by some psychological theory. In particular, research on goal-directed choice suggests that the interruption in acquisition caused by a wish list could strengthen the desire to purchase later (Förster, Liberman, and Higgins 2005; Liu 2008).

In contrast to the conventional wisdom, we propose that the use of a wish list in decision making can result in lower subsequent evaluations of a product and lower

eventual purchase likelihood than if the same option were considered without the use of a wish list. We attribute this outcome to the role of wish lists in changing a one-stage decision into a two-stage decision. We show that desirability attributes and feasibility attributes receive different decision weights during the decision to place an item on a wish list than they do during the decision to purchase a wish-listed item, leading to changes in preferences, including within-subject preference reversals.

Theoretical Background

There are many ways to use a wish list when shopping. According to a general manager at Amazon.com, there are at least four different uses for a wish list (McAllister 2010). Consumers may use a wish list for the purpose of: (1) a same-session temporary holding area during a single shopping trip; (2) a multi-session holding area across multiple shopping/browsing sessions; (3) a gift suggestion for family and friends; (4) sharing products with family and friends (e.g., via email or social media) to help others discover new or specific products. Although originally intended as a form of gift registry to facilitate communication between a gift receiver and potential gift givers (Bradford and Sherry 2013), this paper focuses on the increasingly popular use of wish lists to keep track of the consumer's own potential future purchases. Using a wish list in this way allows a consumer to keep a record of the products that they would like to potentially buy, creating a rolling consideration set that can span product categories and even retailers. When consumers encounter an attractive option that they are unable or unwilling to purchase, a wish list provides an intermediate alternative to outright rejecting the option from further consideration. Instead, wish lists serve as a repository of desirable options that consumers may return to at a later date to reconsider for purchase.

Consumers can hold items indefinitely on their wish lists or in their shopping carts, and these abandoned shopping carts are a serious problem for online retailers. Because we are interested in understanding the psychological mechanism behind why consumers may be less likely to purchase an item that has been placed on a wish list for further consideration, this research may help explain why shopping cart abandonment is a prevalent problem for online retailers.

By encouraging reconsideration of attractive options, wish lists facilitate a type of choice deferral that has not been thoroughly investigated in previous research on deferral (Dhar 1997a, 1997b; Tversky and Shafir 1992). Previous work has primarily examined the factors that increase the likelihood of postponing a choice, including incomplete information (Greenleaf and Lehmann 1995; Gunasti and Ross 2009), the lack of a clearly dominant option (Chernev 2006; Dhar and Simonson 2003; Iyengar, Huberman, and Jiang 2004), and search difficulty (Putsis and Srinivasan 1994). In contrast, wish list usage often entails the selection of a most preferred alternative—it is only the purchase itself that is deferred.

In this research, we propose that a purchase decision using a wish list or another similar delay mechanism is fundamentally different from a purchase decision in which a wish list is not used. In particular, we expect that wish list usage affects the way consumers weight the desirability attributes of an option (e.g., product design and attractiveness) and the feasibility attributes of an option (e.g., price and reliability) when making decisions (Liberman and Trope 1998).

As defined by previous research, desirability attributes include those product qualities that help consumers consider *why* they may wish to have a product. Desirability

attributes that have been previously studied in the literature include quality, product features, product design, and attractiveness (Liberman and Trope 1998; Todorov, Goren, and Trope 2007). On the other hand, feasibility attributes affect *how* the product will be acquired (e.g., price) and used (e.g., functionality). Feasibility attributes that have been previously used in marketing and psychology research include price, functionality, and shopping convenience (Liu 2008; Thomas, Chandran, and Trope 2007). In a typical choice setting, choice is often determined by how consumers make trade-offs between desirability and feasibility attributes.

Previous research points to two possible ways wish list usage could affect consumer decision making. One possible effect of wish lists is to serve as an interruption of the goal to acquire a desired item. According to this view, placing an item on a wish list is likely to increase the likelihood that it will eventually be purchased. Furthermore, this goal-directed choice account predicts that this shift in preference is caused by an increase in the importance of desirability attributes, relative to feasibility attributes, after the wish-list interruption. In contrast, it is possible that wish lists serve as choice partitions, segmenting a unitary purchase decision into a two-stage decision: first, whether to place an item on a wish list, and second, whether to subsequently purchase the wish listed item. In the following sections we discuss the predictions of these two competing theories.

Wish Lists as Goal Interruption

One way of characterizing wish lists is as an interruption of the pursuit of the goal to purchase a product. Placing an item on a wish list is frequently a manifestation of the motivation to buy a desired item at some point in the future. Once a goal has been activated, attempts to inhibit, suppress, or delay fulfillment of the goal tend to increase

the motivation to see it through (Förster, Liberman, and Friedman 2007; Förster, Liberman, and Higgins 2005). Individuals often have enhanced memory and stronger motivation for incomplete goals (Butterfield 1964; Goschke and Kuhl 1993). For example, in one study conducted by McGraw and Fiala (1982), participants were given a very tricky puzzle to solve with what they initially were told was an unlimited amount of time. All of the participants were interrupted before they could finish and then were told that the study was over. Despite being told they were done, nearly 90% of participants continued working on the puzzle. When individuals start something, they are inclined to finish it. Applied to a wish list setting, these findings suggest that interrupting an acquisition goal by putting the item on a wish list should increase a consumer's desire to ultimately purchase it.

A complementary view is that the act of putting an item on a wish list serves as a behavioral signal of the intention to purchase the item. Behavioral self-signals have been shown to promote goal completion behaviors (Gollwitzer 1993). For example, pre-committing an intention to keep an appointment has been shown to increase timely attendance (Owens, Bowman, and Dill 2008). Thus, the act of self-signaling the intent to purchase by wish-listing a product may ultimately increase the likelihood that the consumer will purchase that item.

Goal-directed choice theories make specific predictions with regard to how goal interruption affects the weighting of feasibility and desirability attributes. Liu (2008) demonstrated that consumer preferences often shift toward desirability attributes following an interruption. In the context of goal-directed processing, Liu provided evidence that when choice is interrupted, top-down processing related to the goal

becomes more important, thus shifting focus toward the desirability dimension of the choice options. These findings indicate that consumers can increase their focus on desirability when a purchase decision is temporarily suspended, and conversely, that individuals reduce their focus on feasibility attributes, such as price, after a break in the decision.

Thus, a goal-directed choice account would predict that because wish lists interrupt the pursuit of acquiring the desired item, use of a wish list should increase purchase likelihood. Furthermore, this account predicts that the interruption will subsequently lead to an increased focus on desirability attributes, relative to feasibility attributes, in the purchase decision.

Wish Lists as Multi-stage Decision Making

An alternative to a goal-directed choice account is based on the idea that instead of interrupting a single purchase decision, wish lists serve as a partition that divides a unitary purchase decision into two related, but separate, choices. In the first stage, the consumer decides whether or not to put the item on a wish list. In the second stage, the consumer subsequently returns to the wish list to decide if the product will be purchased. We propose that this two stage decision process leads to predictions about how consumers will weight desirability and feasibility attributes and about purchase likelihood that diverge from the predictions of goal-directed choice theories.

We propose that when making the initial decision to place an item on a wish list, consumers will tend to focus more on an option's desirability attributes than on its feasibility attributes. We make this prediction for three reasons. First, the determination of whether it is worthwhile to re-evaluate an option again at some point in the future is

likely to be driven by how desirable an option is perceived to be. Desirability attributes help consumers think about why they want a product and why the product merits inclusion on a wish list. Consumers will tend to be more willing to return to and re-evaluate products that are seen as exciting, attractive, or appealing. In other words, items that perform well on desirability attributes will tend to be more likely to be put on a wish list.

Second, desirability information more strongly increases purchase intentions for the distant, rather than near, future (Thomas, Chandran, and Trope 2007). To the extent that using a wish list is an explicit attempt to shift a potentially near-term purchase decision into the future, we should expect desirability attributes to be relatively more important in making the decision to put an item on a wish list.

Third, in relative terms, placing an item onto a wish list is a less accountable decision than purchase. Adding an item to a wish list entails no risk on the part of the consumer and requires little justification. As such, feasibility attributes tend to be less important relative to desirability attributes in the initial decision to put an item on the wish list.

In contrast, we propose that the second stage in the decision making process, the decision of whether or not to purchase an item from a wish list, will tend to be based relatively more on an item's feasibility attributes and relatively less on an item's desirability attributes. We make this prediction for two reasons. First, purchase decisions are more immediate and more consequential than decisions to place an item on a wish list (Thomas, Chandran, and Trope 2007). Pragmatic concerns become more important when thinking about an imminent purchase, and in this situation opportunities and constraints

become increasingly guided by practical thoughts (Kivetz and Tyler 2007). Feasibility attributes describe how much an offering costs, what function it will fulfill, and how likely it is to perform well. When the consumer is faced with actually having to pay for an item, and consider its usage and performance, feasibility attributes will naturally become more important.

The second reason to expect that feasibility attributes tend to receive relatively more weight at the second stage of the decision is based on the prediction that desirability attributes tend to be relatively more important in the first stage. Research on multi-stage decision models has shown that consumers deemphasize information that has already been used in previous decision stages (Chakravarti, Janiszewski, and Ülkümen 2006; Diehl, Kornish, and Lynch 2003; Wright and Barbour 1977). For example, Larson and Hamilton (2012) studied a specific two-stage process where individuals thought about their spending goals in the first stage. When price was emphasized in the first stage of the decision, other, non-price product qualities became relatively more important in the second stage. To the extent that wish lists partition a purchase decision into two-stages, we should expect that if desirability attributes are emphasized in the first stage, feasibility attributes will tend to dominate in the second stage.

These differences in how consumers weight desirability and feasibility attributes at various stages in the decision have implications for the purchase likelihood of wish-listed items. For many offerings, a decreased emphasis on desirable attributes and an increased emphasis on feasible attributes will tend to decrease purchase likelihood. This prediction should be especially true of the highly desirable, appealing, and attractive options typically selected to go onto a wish list. When the desirability attributes of a highly

desirable option are de-emphasized in favor of the feasibility attributes (e.g., price, durability, ease of installation) the result will often be a lower overall evaluation of the option. We therefore predict that, compared to a purchase decision without a wish list, the use of a wish list can lead to a decrease in purchase intent.

Without a wish list, it is likely that desirability and feasibility attributes are considered together in the purchase decision, and as a result, both types of attributes tend to receive more equal attention. Desirability attributes are expected to be important in a one-stage purchase decision, which should increase the likelihood of purchase relative to using a wish list. Therefore, purchase likelihood is expected to be lower after re-evaluating a product that has been placed onto a wish list, as compared to a purchase decision in which consumers are not using a wish list.

In summary, contrary to the conventional wisdom and to the predictions of some goal-directed choice theories, we predict that the use of wish lists can decrease the likelihood of purchase relative to a decision making process without the use of a wish list for desired offerings. We derived this prediction from expectations about the relative weight consumers are likely to place on desirability and feasibility attributes at each stage of the decision. Specifically, we predicted that desirability attributes would be relatively more important in the first stage, in which consumers are considering whether to put an item on a wish list. In contrast, in the second stage, when consumers decide whether to purchase a wish-listed item, feasibility attributes are expected to be relatively more important.

Six experiments tested these predictions. Studies 1a and 1b demonstrate a decreased purchase intent and willingness to pay for items placed on a wish list relative to a

scenario in which participants are given an equivalent choice without a wish list. The second study shows that decreased purchase intent found in the first two studies is robust across various labels for the list and is not limited to the label of "wish list." The third study examines the underlying process, in particular showing a primacy of desirability over feasibility in initial decisions to place an item on a wish list, but that feasibility tends to be relatively more important in the decision to purchase off a wish list. The fourth study shows the effect of wish list usage on choice, revealing a within subjects preference reversal, with different options selected for a wish list and chosen for purchase. The fifth study demonstrates that a wish list option can shift choice shares such that wish-listed items are less likely to be purchased. The last study examines an important implication, that advertisements featuring feasibility attributes of the product (e.g., price) can increase purchase likelihood for wish-listed products, relative to ads featuring desirability attributes (e.g., product quality).

Experiment 1a:

Using a Wish List Lowers Purchase Likelihood

The purpose of experiment 1a was to examine whether using a wish list can result in a lower likelihood of purchasing an item than an otherwise similar setting without a wish list.

Method

One hundred and two adults located in the US, drawn from Amazon Mechanical Turk (MTurk) completed a survey that was ostensibly about online shopping. The respondents (47% female, average age of 32) were randomly assigned to one of two conditions (a wish list condition and a purchase condition) and were first shown a Nikon

Coolpix digital camera. Information shown to participants was typical of what consumers would view on an online shopping website and included a picture, product name, manufacturer, price, average consumer rating (four out of five stars), and number of customer reviews. See Appendix A for a representation of the stimuli. Participants were asked to imagine that they were thinking of buying a new digital camera. They were next asked to list some reasons why they might be interested in purchasing this particular camera (purchase condition) or why they might want to put this particular camera on a wish list (wish list condition).

After providing these initial reasons, participants completed a filler task that consisted of selecting their most preferred option between two similar products in five different product categories: scissors, glassware, flower arrangements, gems, and pens. The filler task was used to allow some time to pass between initial consideration of the product and re-evaluation. Following the filler task, participants were again shown the digital camera. In the purchase condition they were asked to rate how likely they would be to purchase the camera using a seven-point scale ranging from "very unlikely" to "very likely." In the wish list condition participants were asked to imagine that they had in fact decided to put the item on a wish list and that some time had passed since then. They were asked to rate how likely they would be to purchase the camera using the same scale as in the purchase condition. Respondents were also asked whether and how often they personally use a wish list, along with their specific purpose(s) for using a wish list.

Results

According to the multi-stage decision making account we have proposed, consumers who place a product on a wish list will tend to be less likely to purchase that

item than consumers who are making the same purchase decision without using a wish list. Consistent with this prediction, a one-way ANOVA revealed a significant main effect of wish list condition on purchase likelihood ratings ($F(1, 100) = 5.58$, $p < .05$). Specifically, the mean purchase likelihood in the wish list condition ($M = 4.85$, $SD = 1.22$) was significantly lower than in the purchase condition ($M = 5.41$, $SD = 1.17$). This finding indicates that participants were less likely to purchase an item that had been previously placed on a wish list than they would be in a similar purchase decision context without using a wish list. Participant gender, age, and wish list usage did not significantly interact with the experimental conditions.

Most participants (76%) indicated that they used a wish list, and of those, 65% indicated that they used a wish list at least once a month. All of the participants who use wish lists indicated that the purpose is to help keep track of items they may be interested in purchasing for themselves at a later date, while some said that wish lists are also used to keep track of gift ideas for friends and family (46%), and/or keep a list of items that others might purchase on their behalf (37%).

Discussion

Experiment 1a provides initial evidence that individuals who think about using a wish list to defer purchases may be less likely to purchase an item than consumers who are simply making the decision of whether or not to buy. This decreased purchase likelihood occurs even though individuals are evaluating the same product and using a similar process to think through product advantages in both conditions. Experiment 1b was designed to determine whether consumers would be willing to pay more for an item in a purchase scenario than in an otherwise similar wish list scenario.

Experiment 1b:

Using a Wish List Lowers Willingness to Pay

Experiment 1b was designed to extend the findings of experiment 1a to examine whether using a wish list can also result in a lower willingness to pay for an item than for the same item in an otherwise similar setting without a wish list.

Method

Ninety adults located in the US, drawn from MTurk completed a survey that was ostensibly about online shopping. The respondents (34% female, average age of 32) were first randomly assigned to one of two conditions (a wish list condition and a purchase condition) and were first shown a Nikon Coolpix digital camera. The experimental procedure and was similar to experiment 1a, with a typical description of the product, except that participants were not shown the price of the digital camera.

Following the filler task in both conditions, participants were again shown the digital camera. In the purchase condition they were asked how much they would be willing to pay for the camera by typing an amount into a text box. In the wish list condition participants were asked to imagine that they had in fact decided to put the item on a wish list and that some time had passed since then. They were asked to rate how likely they would be to purchase the camera using the same willingness to pay measure as in the purchase condition. Respondents were also asked whether and how often they personally use a wish list, along with their specific purpose(s) for using a wish list.

Results

We have argued that if a wish list serves to partition a purchase decision into two-stages, then consumers who place a product on a wish list should subsequently value that

offering less, and so they should be willing to pay less for an item, than consumers who are making the same purchase decision without a wish list. Consistent with this prediction, a one-way ANOVA revealed a significant main effect of wish list condition on willingness to pay ($F(1, 88) = 4.17$, $p < .05$). Specifically, the mean amount in the wish list condition (M = \$234) was significantly lower than in the purchase condition (M = \$299). This finding indicates that participants were willing to pay significantly less for an item that has been previously placed on a wish list than they would be for the same item in a similar purchase decision context without a wish list. Participant gender, age, and wish list usage did not significantly interact with the experimental condition.

Most participants (71%) indicated that they used a wish list, and of those, 72% indicated that they used a wish list at least once a month. Most of the participants who use wish lists indicated that the purpose is to help keep track of items they may be interested in purchasing for themselves at a later date (97%), while some said that wish lists are also used to keep track of gift ideas for friends and family (50%), and/or keep a list of items that others might purchase on their behalf (44%).

The open-ended responses from studies 1a and 1b were combined and analyzed in terms of participants mentioning desirability or feasibility product attributes. Two independent coders with an inter-rater reliability of 85% classified responses as mentioning feasibility (e.g., price, in stock, product feature) or desirability (e.g., reviews, attractiveness, brand quality). A chi-square analysis of the data revealed that participants mentioned significantly more desirability attributes in the wish list condition (54%) and more feasibility attributes in the purchase condition (63%; $\chi^2(1) = 11.89$, $p < .001$).

Discussion

Experiments 1a and 1b provide evidence that the use of a wish list can lead to a decrease in the overall evaluation of an item, as measured by both purchase likelihood and willingness to pay. These studies used filler tasks to create some separation between the initial product evaluation and the re-evaluation and provide some initial evidence for a two-stage decision making process.

One alternative explanation for the results of these findings so far is that the term "wish list" implies some level of aspirational purchasing, which may have lead participants to infer decreased purchase likelihood. Experiment 2 was therefore designed to test for this possibility by examining relative purchase likelihood with other methods for partitioning a possible purchase decision, including using a shopping cart and saved for later list.

Experiment 2:

What's in a Name? Other Labels for Wish Lists

The purpose of experiment 2 was to determine whether decreased purchase likelihood is driven by the aspirational nature of labeling the mechanism a "wish list" versus another often-used label (e.g., shopping cart, saved for later list), or whether the decision partition associated with deferring a purchase while using any of these tools, regardless of its label, is shifting consumer preferences.

Method

One hundred and sixty adults located in the US, drawn from MTurk completed a survey that was ostensibly about online shopping. The respondents (40% female, average age of 31) were randomly assigned to one of four conditions: Purchase (without delay),

Wish List, Saved for Later list, or Shopping Cart. Participants were first shown a Sony Blu-ray disc player. Information shown to participants was typical of what consumers would view on an online shopping website and included a picture, product name, manufacturer, price, average consumer rating (four out of five stars), and number of customer reviews. See Appendix B for a representation of the stimuli.

Participants in all four conditions were asked to list some reasons why they might want to either purchase this Blu-ray player or why they might want to put it on their wish list (or saved for later list, or in their shopping cart). The filler task for this study was a delay discounting task to help determine whether thinking about a wish list can prime inaction. Participants were presented with a series of choices between two hypothetical rewards where one is smaller and available immediately, and the other is larger and available after some time. Participants responded to 10 questions adapted from Kirby et al. (1999) where the monetary values ranged from $14 to $85 and the time delays ranged from 19 days to 162 days. A demonstrated preference for the larger reward in such a task can result from an inaction goal prime (Hepler et al. 2012). Thus if a wish list is priming an inaction mindset, then participants should demonstrate significantly lower discount rates than participants in the purchase condition.

Following the filler task, participants were again shown the Blu-ray player. They were asked to imagine that they had in fact decided to put the item on a wish list/saved for later list/shopping cart and that it had been there for a while. They were asked to rate how likely they would be to purchase the camera using a seven-point scale ranging from "very unlikely" to "very likely." Respondents were also asked how often they personally use a wish list.

Results

According to our theory, using a wish list, shopping cart, or saved for later list to defer a purchase for later consideration will each similarly induce a two-stage decision-making process, regardless of its name. While the name "wish list" implies a more aspirational purchase, it should not be necessary to prime consumers with a wish or desire in order to observe decreased purchase likelihood. Rather, the mere act of deferring the purchase and then re-evaluating the item should lead to these results.

Consistent with a two-stage decision making account, a one-way ANOVA revealed that there was a significant main effect of label ($F(3, 156) = 3.49$, $p < .05$) such that the mean purchase likelihood in the purchase (without delay) condition ($M = 5.41$, $SD = 0.99$) was significantly higher than all of the partition mechanisms (Wish List $M = 4.85$ ($SD = 1.31$); Saved for Later $M = 4.71$ ($SD = 1.17$); Shopping Cart $M = 4.56$ ($SD = 1.55$); e.g., purchase vs. wish list $t(78) = -2.18$, $p < .05$). Participant gender, age, and wish list usage did not significantly interact with the experimental conditions. None of the means in the three delay conditions differed from one another (see figure 2.1).

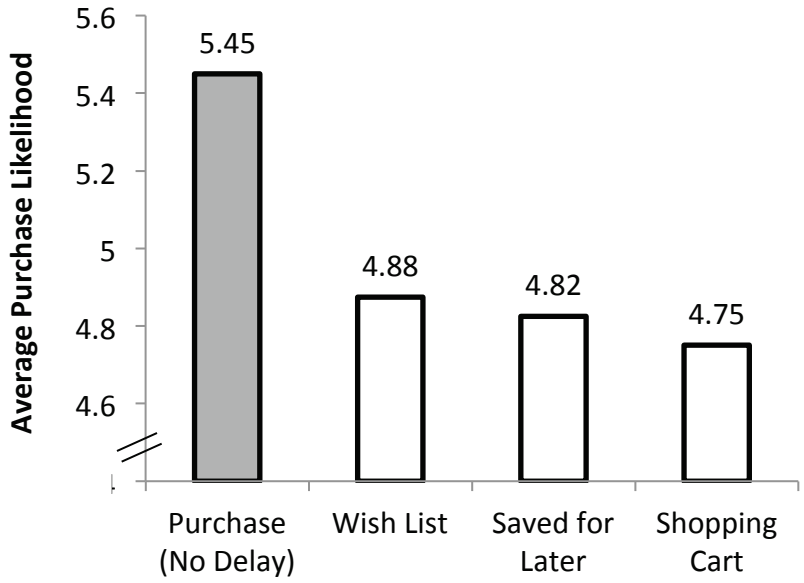

Figure 2.1. Effect of label on purchase likelihood.

Discount rates (k-values as defined by Kirby et al. 1999) were calculated for each of the ten choices and averaged together for participants in the wish list and purchase conditions, respectively. A one-way ANOVA revealed no significant difference between these two groups in the delay discounting task (Wish List M = .0045 (SD = .0024), Purchase M = .0049 (SD = .0024); $F(3,156 = .35, p = .79)$. The results of the delay discounting task indicate that participants in the wish list condition do not seem to adopt a more inactive mindset than those in the purchase condition.

Discussion

Experiment 2 provides evidence that a two-stage decision leads to lower purchase likelihood, regardless of whether a consumer uses a wish list, shopping cart, or saved for later list. The mean purchase likelihood in all three of the partition conditions, regardless of label, was lower than in the purchase (without delay) condition.

We have proposed that this effect is caused by a relative decreased focus on desirability and increased focus on feasibility in the second stage of the decision, selecting an item from a wish list. Whereas two-stage decision experiments typically prime participants with a particular consideration in the first stage, here we tested whether participants spontaneously consider desirability when putting an item on a wish list and alternatively consider feasibility when deciding whether to purchase the same item. Though the findings of the previous experiments are consistent with this account, they have not yet provided direct evidence of the differential weighting of these two types of attributes. Experiment 3 was designed to test for this underlying decision-making process.

Experiment 3:

Differential Weighting of Desirability and Feasibility

The purpose of this experiment was to examine whether consumers would weight desirability attributes as relatively more important compared to feasibility attributes when making an initial decision to place an item on a wish list, and relatively less important when making the decision to purchase an item after it had been placed on a wish list. Experiment 3 utilized a within-subjects design, which better mimics wish list usage in the real world, since the same person evaluates a product at multiple points in time. In this study, the dependent variables, importance of desirability and feasibility attributes, were operationalized as a set of six ratings that independently measured three desirability and three feasibility attributes of the decision.

Method

Forty-six adult participants from the United States, drawn from MTurk, completed a survey about online shopping. The respondents (63% female, average age of 35) were shown an iRobot Roomba automatic vacuum cleaner. Information shown to participants was typical of what consumers would view on an online shopping website and included a picture, product name, manufacturer, price, average consumer rating (out of five stars), and the number of "likes." See Appendix C for a representation of the stimuli.

Participants were first asked to rate the product attractiveness. Next, they were asked to imagine that they were considering putting the Roomba on their wish list and were asked to rate the importance of three feasibility and three desirability attributes in making this decision. The six independent ratings were presented as 7-point scales anchored on 1 = "not at all important" and 7 = "extremely important." Based on previous research (Liberman and Trope 1998; Liu 2008; Thomas, Chandran, and Trope 2007; Todorov, Goren, and Trope 2007), design, reliability and product features were selected as desirability attributes, and budget, excitement/interest, and price were selected as feasibility attributes.

In order to confirm that these attributes represented desirability and feasibility, a separate pre-test was conducted where participants were asked to rate these six attributes using definitions provided by Liberman and Trope (1998). Fifty participants (36% female with an average age of 32) rated the attributes by responding to the prompt, "In general, to what extent do you think that knowing a product highly is rated as having [attribute] is more relevant for determining..." using a 7-point bi-polar scale where the left side of the scale was presented as 1 = "Why you like the product" and the right side of the scale was 7 = "How easy it would be for you to purchase the product." This pre-test revealed that

the attributes were rated as being consistent with their definitions, as there was a highly significant difference between the scale ratings of desirability attributes ($M = 2.56$, $SD = 1.16$) and feasibility attributes ($M = 4.50$, $SD = 1.14$; $t(49) = -8.78$, $p < .001$).

After providing their initial attribute importance ratings, participants were then asked to list in an essay box a few reasons why they might personally decide to place the product on a wish list. This question was used to encourage participants to become more involved in the task and think about personally using a wish list. Next, they were asked to imagine that several weeks had passed. They then were asked to re-rate product attractiveness and re-rate the importance of the same desirability and feasibility ratings, assuming that they were now reevaluating the item for purchase. At the end of the survey, participants provided information about their wish list familiarity, age, and gender.

Results

We predicted that consumers tend to be relatively more concerned with desirability attributes when placing an item on a wish list, and relatively more concerned with feasibility when later re-evaluating the same item for purchase. A repeated measures MANOVA predicting the importance ratings of desirability and feasibility attributes as a function of the stage in the decision making (pre- vs. post-wish list) revealed that there was a significant interaction between the two factors of desirability/feasibility and decision stage ($F(2, 127) = 5.40$, $p < .01$). Figure 2.2 illustrates the differences in mean ratings for the pre-wish list and post-wish list decisions when the individual ratings of desirability and feasibility attributes were averaged together. Wish list familiarity, age, and gender did not interact significantly with these ratings.

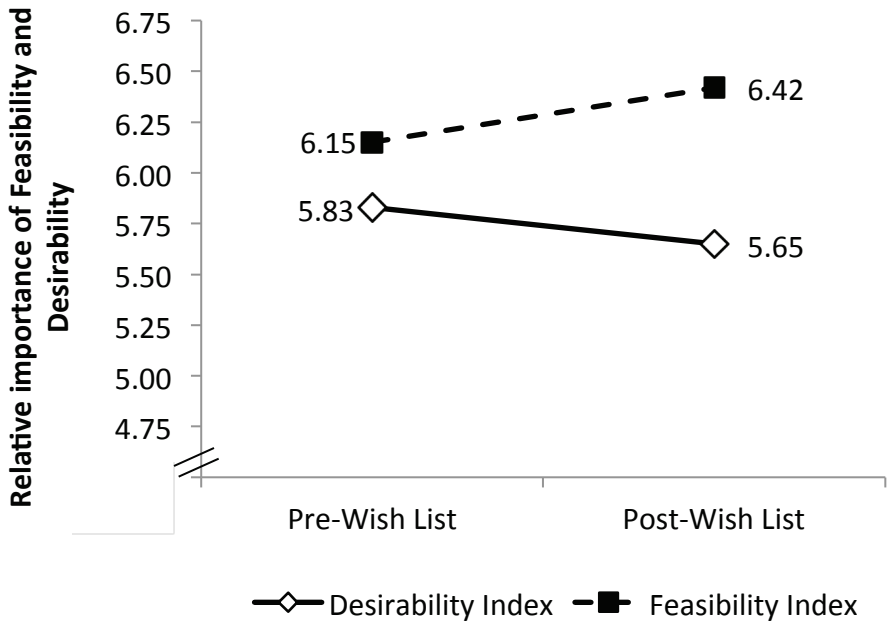

Figure 2.2. The relative importance of desirability and feasibility attributes.

There were no significant differences between the average ratings of product attractiveness at the beginning of the study ($M = 4.91$, $SD = 1.56$) and at the end of the study ($M = 4.96$, $SD = 1.43$; $t(45) = -.34$, $p = .74$), suggesting that overall attractiveness of the product did not change during the study.

The open-ended responses from this study were analyzed in terms of participants mentioning desirability or feasibility product attributes. Two independent coders with an inter-rater reliability of 89% classified responses as mentioning feasibility (e.g., price, warranty, reliability) or desirability (e.g., reviews, attractiveness, design). A chi-square analysis of the data revealed that participants mentioned significantly more desirability attributes in the wish list condition (77%) and more feasibility attributes in the purchase condition (54%; $\chi^2(1) = 12.94$, $p < .001$).

Discussion

The findings from this experiment provide evidence that consumers weight desirability attributes more heavily when deciding to put something on a wish list and feasibility attributes more heavily when they are deciding to purchase a wish-listed item. This suggests that desirability attributes may be more important for the decision to put a product on a wish list, whereas feasibility attributes become more important when the product is re-evaluated for possible purchase.

One implication of the account we have proposed is that this difference in attribute weighting could lead to inconsistent preferences when choices are made at the wish list and purchase stages. Since desirability and feasibility attributes are weighted differently for each of these decisions, it is possible that consumers could choose different products in the same category to put onto a wish list than they would choose to purchase from a wish list. Differences in the weighting of these two types of attributes could even lead to the same consumer to switch preferences, and choose different products in each stage of the decision. Experiment 4 was designed to test this prediction that consumers would also make the choice to put more desirable products on a wish lists, while instead choosing more feasible products to purchase from a wish list.

Experiment 4:

Product Choice

The goal of this experiment was to examine whether the choice of which item to put on a wish list can be different than the choice of which item to buy from a wish list. We predicted that a product with better performance on desirable attributes will be more likely to be placed on a wish list, while a similar product with better performance on

feasible attributes will be more likely to be purchased from a wish list. The method, results, and a discussion of the findings of this experiment are presented in detail next.

Method

Forty participants drawn from MTurk completed a survey about online shopping. The respondents were 40% female with an average age of 34 years. Participants were first shown the following scenario:

> *Bryan is a college student who wants to buy a laptop computer. He spent some time looking at several options online, and he found a few different laptops that he liked. He has narrowed down his options to two choices. Bryan uses a wish list to keep track of products he is interested in, and he now wants to put one of these laptops on his wish list for further consideration.*

See table 1 for a representation of the stimuli. A computer is an example of a product that has been shown to be able to be classified as either desirable or feasible, depending on how it is described (Crowley, Spangenberg, and Hughes 1992; Park, Jaworski, and MacInnis 1986). We designed the stimuli such that, in relative terms, Laptop A represented a high feasibility/low desirability option, while Laptop B represented a high desirability/low feasibility option. We selected these desirability and feasibility attributes to be consistent with previous studies that have used a rebate as representative of feasibility (Liberman, Trope, and Wakslak 2007) and quality as desirability attribute (Liu 2008). As such, Laptop A and Laptop B both were presented as being the latest models, but Laptop A (high feasibility) had a rebate and a slightly lower quality rating, while Laptop B (high desirability) had a slightly higher quality rating and no rebate.

Table 1. Laptop attributes

Laptop A (Feasible option)	Laptop B (Desirable option)
Good quality rating (7/10)	High quality rating (9/10)
Latest model	Latest model
$100 rebate	No rebate

Note: $100 rebate is a feasibility attribute (Liberman, Trope, and Wakslak 2007), and high quality rating is a desirability attribute (Liu 2008).

After choosing one of the two laptops for the wish list, participants were then told that Bryan had ultimately decided to put both options on his wish list. They were asked to indicate which of the two options Bryan would be more likely to purchase, if they both had been on his wish list for a while. Additional measures included personal experience with a laptop computer and personal wish list usage.

A separate pre-test was conducted to test initial product attractiveness and liking. Fifty participants (52% female with an average age of 31) rated both laptops using two 7-point scales: (1) How attractive is this laptop? where 1 = "very unattractive" and 7 = "very attractive," and (2) How much do you like this laptop? where 1 = "dislike extremely" and 7 = "like extremely." The pre-test revealed that Laptop B (high desirability) was in fact perceived as more attractive (M_{attB} = 5.78, SD = .84) and was liked more (M_{likeB} = 5.68, SD = .89) than Laptop A (M_{attA} = 5.46 (SD = .67), $t(49) = -2.31$, $p < .05$; M_{likeA} = 5.28 (SD = .61), $t(49) = -2.86$, $p < .01$), which is consistent with Laptop B having been described as the more desirable option.

Results

We predicted that consumers will be relatively more likely to place a more desirable item on a wish list, and relatively more likely to choose a more feasible item from a wish list to purchase. The relative choice shares between Laptop A and Laptop B were

compared for the decision to put a product on a wish list versus purchase a product after the choices had been on a wish list for a while. Because this was a within-subjects design, McNemar's test was used in the chi-square analysis. This test indicated that the differences were significant ($\chi^2(1) = 19.49$, $p < .05$). Laptop B (high desirability) was more likely to be put on a wish list for further consideration, while Laptop A (high feasibility) was more likely to be purchased after both options had been on a wish list. Thirty-five percent of respondents thought that Bryan would be more likely to put the more feasible option (Laptop A) on his wish list, while 53% thought he would end up buying the same laptop. Since Laptop A was pre-tested as less attractive and less liked than Laptop B, this switching did not occur due to overall attractiveness or liking. Rather, the switching behavior is more consistent with differential weighting of desirability and feasibility attributes.

Another way of examining this data is to look at the consistency of participants' second choice as a function of their first choice. Of the 35% who indicated that Laptop A (high feasibility) would be put on the wish list, all of those participants also indicated that Bryan would end up buying the same laptop. That is, those who chose the more feasible option did not switch their preference. However, of the 65% who chose Laptop B (high desirability) to be put on the wish list, 27% of those participants also indicated that Bryan would end up buying the other laptop ($z = 3.75$, $p < .0001$). This indicates that many of the participants who initially chose the more desirable option switched their preference to the more feasible option. This finding supports the proposition that a more feasible wish-listed option is more likely to ultimately be selected for purchase off a wish list, even if it is less likely to be put on the wish list in the first place. Participant gender, age, self-

reports of laptop product knowledge, and wish list usage did not correlate significantly with choice of laptop.

Discussion

The findings from this experiment are consistent with the notion that individuals are relatively more concerned with feasibility attributes when they are making a purchase decision, and relatively more driven by desirability when they are initially deciding whether to put an item on a wish list. Across experiments, these findings provide converging evidence for two-stage decision making consisting of differential weighting between desirability and feasibility when a wish list is used. This differential weighting not only impacts the relative importance of product attributes, but it also impacts product choice based on those attributes, demonstrating a within-subjects preference reversal. To further test for differences in choice, the next study compares a buy/no buy condition with a buy/no buy/wish list condition to examine differences in choice shares. Experiment 5 examines whether having a wish list option available to consumers can decrease overall purchase rates for a relatively desirable product, relative to a shopping scenario without a wish list.

Experiment 5:

Purchase Choice Shares Study

The purpose of this experiment was to examine whether the presence of a wish list option would shift choice shares when consumers are considering whether or not to purchase a product. Specifically, based on our theoretical account, we predict that the option to put an item onto a wish list will lower the number of products purchased, relative to a situation where consumers are not given an option to use a wish list. We

further predict that when consumers are given the option to re-evaluate an item on a wish list, most consumers will elect to keep the wish-listed item on their wish lists rather than making a choice to buy or not buy the item.

Method

Two hundred adults located in the US, drawn from Amazon Mechanical Turk (MTurk) completed a survey that was ostensibly about online shopping. The respondents (36% female with an average age of 31) were randomly assigned to one of two conditions (a purchase only choice condition and a wish list option condition) and were first shown a pair of earbud headphones with zipper cords to keep them untangled. Information shown to participants was typical of what consumers would view on an online shopping website and included a picture, product name, manufacturer, price, average consumer rating (four and a half out of five stars), and number of customer reviews.

Participants in the purchase only choice condition were given the binary choice to either buy or not buy the item. Participants in the wish list condition were asked to either buy the item now, not buy the item now, or put the item on their wish list for further consideration. Following a filler task in the wish list condition, those participants who initially chose to place the item on a wish list were again asked whether they would like to buy the item, not buy the item, or continue to keep the item on their wish list for further consideration.

Results

A chi-square analysis compared the proportions of participants who chose to buy or not buy the item in both conditions and found a significant difference between conditions ($\chi^2(1) = 5.18, p < .05$). Nearly half (49%) of the participants in the purchase only choice

condition said they would buy the item, whereas only 22% of participants in the wish list choice condition initially said they would purchase the item. When participants in the wish list choice condition were asked to re-evaluate the product for possible purchase, most (68%) chose to leave the item on their wish list. Adding up the choice shares in the wish list choice condition, 38% said they would buy the product during either time they evaluated the product, compared to 49% in the purchase only choice condition ($z = 1.57$, $p = .06$; See table 2).

Table 2. Purchase choice shares

	Buy	Don't buy	Put on wish list
Condition 1: Purchase only	49% (49/100)	51% (51/100)	--
Condition 2: Wish list option	22% (22/100)	13% (13/100)	65% (65/100)
Post-wish list consideration	25% (16/65)	8% (5/65)	68% (44/65)
Condition 2 Total	38% (38/100)	18% (18/100)	44% (44/100)

Discussion

This experiment provides additional evidence, by measuring yes/no/maybe choice rather than purchase likelihood, that having a wish list option available to consumers can decrease overall purchase rates for a relatively desirable product. This study also demonstrates that once people put an item on their wish list, they will tend to keep it there rather than changing their mind about possibly purchasing the item.

The previous studies raise some interesting managerial implications. In order to get people to complete a purchase for an item that had previously been wish listed, retailers need to help consumers overcome the feasibility concerns that become a focus under re-

evaluation. The next study examines whether providing consumers with targeted ads featuring feasibility product attributes will increase purchase likelihood for wish-listed items, relative to ads featuring desirability product attributes.

Experiment 6:

Ad Reminder Study

The purpose of this experiment was to examine whether different types of advertisements shown to consumers would impact purchase likelihood. Since consumers rate desirability attributes as more important for the decision to place an item onto a wish list and feasibility attributes as more important for the purchase decision, we propose that an advertisement that is more focused on feasibility (e.g., price) will increase purchase likelihood, relative to an advertisement that is more focused on desirability (e.g., product quality) after a product was placed onto a wish list. Conversely, a desirability-focused ad should increase purchase likelihood for a purchase decision without a wish list.

Method

This study used a 2 (purchase decision: immediate vs. wish list) x 2 (advertisement type: desirability vs. feasibility) between-subjects design. One hundred and eighty adults located in the US and drawn from MTurk completed a survey about online shopping. The respondents (35% female with an average age of 32) were randomly assigned to one of the four conditions. Information shown to participants was typical of what consumers would view on an online shopping website and included a picture, product name, manufacturer, price, average consumer rating (four out of five stars), and number of customer reviews. Participants were asked to imagine that they were thinking of purchasing a new Blu-ray player. They were next asked to list some reasons why they

might be interested in purchasing this particular Blu-ray player (purchase condition) or why they might want to put this particular Blu-ray player on a wish list (wish list condition).

After providing these initial reasons, participants in the wish list condition completed the same filler task as in the first experiment. Following the filler task, participants were again shown the Blu-ray player in an advertisement that either featured a list price ($119.99) with a discounted price and savings ($78, a savings of $41.99 (35%)), or an advertisement that featured a more detailed product description (including the phrases "Streaming Blu-ray Disk Player with Super Wi-Fi," and "#1 Blu-ray Player Brand"). They were asked to imagine that they had in fact decided to put the item on a wish list and then rated how likely they would be to purchase the this item using a seven-point scale ranging from "very unlikely" to "very likely." Additional measures included how often respondents personally use a wish list, age, and gender. Participants did not complete the filler task in the purchase condition and were simply asked to rate how likely they would be to purchase the item using the same seven-point scale after randomly viewing one of the two advertisements.

Results

According to the multi-stage decision making account, a wish list separates a purchase decision into two stages whereby desirability concerns are more important for the decision to place the item onto the list and feasibility concerns are more important for the purchase decision. Conversely, in a simple, uninterrupted one-stage purchase decision, desirability concerns should be weighted somewhat more heavily. If this is the case, then the feasibility ad (with price) should increase purchase likelihood in the wish

list condition, whereas the desirability ad (with product description) should increase purchase likelihood in the purchase condition.

Consistent with this prediction, a 2-way ANOVA showed a significant purchase decision x advertisement type interaction ($F(1, 176) = 17.3$, $p < .01$), while neither main effect was significant. Specifically, purchase likelihood was higher in the wish list condition when participants were shown the feasibility ad ($M = 5.40$) rather than the desirability ad ($M = 4.62$, $t(88) = 2.95$, $p < .01$). Conversely, purchase likelihood was higher in the purchase condition when participants were shown the desirability ad ($M = 5.56$) rather than the feasibility ad ($M = 4.87$, $t(88) = -2.94$, $p < .01$; See figure 2.3).

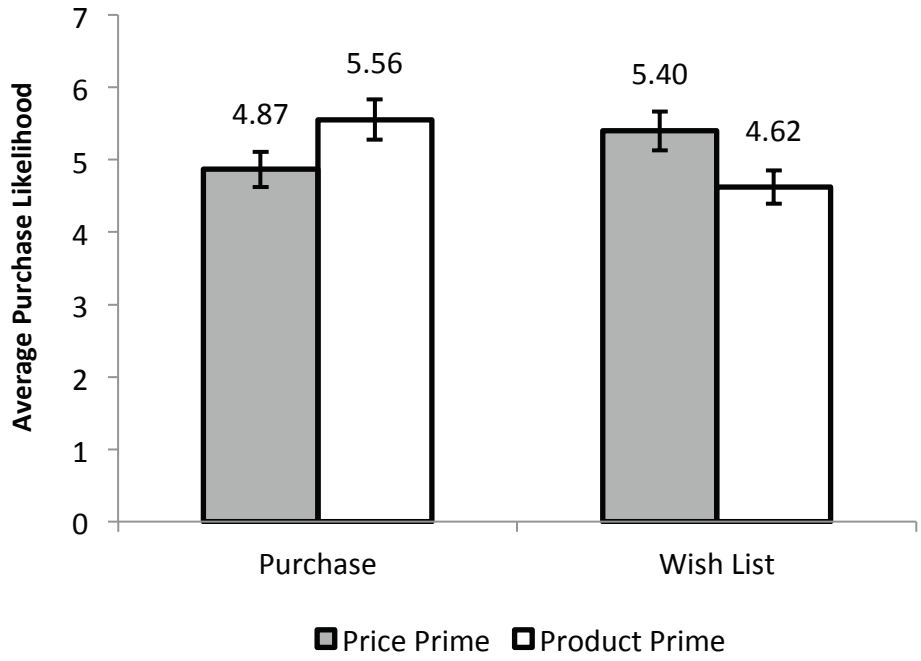

Figure 2.3. Purchase likelihood by advertisement type.

Discussion

This experiment provides evidence that the type of information featured in an advertisement is an important consideration when the goal is to increased purchase

likelihood of wish-listed items. Marketing managers would benefit from making the wish-listed items seem more feasible to the consumer (e.g., stressing the low price of the item compared to other stores or offering discounts) when planning targeted ad campaigns for wish-listed items. When online retailers do not offer a wish list for their customers, targeted ad campaigns should instead make items seem more desirable (e.g., emphasizing unique and exciting product features or enhanced product design). Marketing managers may also want to remind consumers of their previously wish-listed products through email campaigns that emphasize the feasible product attributes.

General Discussion

A series of six experiments demonstrated that, contrary to conventional wisdom, placing items on a wish list can lead to decreased purchase likelihood relative to a case where no wish list was used. We have argued that a wish list effectively partitions a one-stage purchase decision into a two-stage decision: first the decision to place the item on the wish list and later reevaluating the item for possible purchase. We proposed and provide evidence for a greater focus on desirability attributes in the first stage of the decision and a greater focus on feasibility in the second stage.

Experiment 1 demonstrated that consumers were less likely to purchase an item that has been placed on a wish list, and willing to pay less for an item, relative to a similar situation where they were only evaluating whether or not to buy it. Experiment 2 showed that decreased purchase likelihood occurs while using a wish list, saved for later list, or shopping cart to partition a purchase decision, supporting the notion that the label of the partition device is not as important as the partition itself. Experiment 3 demonstrated the underlying process: people weight desirability attributes more heavily when making the

decision to place an item on a wish list, whereas they weight feasibility attributes relatively more heavily when subsequently deciding whether to buy. Experiment 4 extended these findings by demonstrating that an option that dominates on desirability attributes was more likely to be chosen in the first stage, whereas an option that dominates on feasibility attributes was more likely to be chosen in the second stage. This experiment also showed that the use of a wish list can lead to within-subject preference reversals. Experiment 5 showed that having the option to wish list an item leads to decreased purchase rates. Experiment 6 demonstrated an implication of these studies, that the type of information featured in an advertisement is an important consideration when retailers want consumers to purchase previously wish-listed items.

Theoretical Contributions

These studies make several contributions to the literature on choice deferral. We do not refute the findings of some goal-directed choice theories (Butterfield 1964; Förster, Liberman, and Friedman 2007; Förster, Liberman, and Higgins 2005; Goschke and Kuhl 1993). Rather, we demonstrate that goal-directed choice may be less likely to be observed in a wish list context. These theories suggest that, to the extent that wish lists interrupt the goal of obtaining an item, consumers should be more likely to purchase items on a wish list. Additionally, while goal-directed choice would predict that desirability should become more prominent as consumers get closer to completing a purchase, we have shown that feasibility becomes more important for a wish list purchase decision.

These experiments also provide new insights into our understanding of two-stage decision making by demonstrating how attitudes toward products on wish lists unfold naturally. Traditional two-stage decision making research typically primes individuals

with a particular attribute in the first stage and demonstrates that the primed attribute is no longer as important in the second stage (Chakravarti, Janiszewski, and Ülkümen 2006; Diehl, Kornish, and Lynch 2003; Wright and Barbour 1977). For example, in a partitioned choice condition of one study, participants were first asked to think about the crunchiness of popcorn, which lead that particular attribute to become less important in a subsequent choice among various brands of popcorn (Chakravarti, Janiszewski, and Ülkümen 2006). Our results show that this type of priming is not necessary in order to activate desirability in the first stage of the decision and feasibility in the second stage of a wish list decision. Rather, the function of wish lists seemed to be enough to encourage participants to focus on desirability attributes without explicit instructions to do so.

Marketing Implications

These results have important implications for consumers. In particular, these findings suggest that consumers may use wish lists as a self-control device. If, rather than shopping compulsively, consumers place desired items on a wish list, our findings suggest that they may be less likely to ultimately purchase the desired offerings. Deferring a purchase by using a wish list can therefore function as a means of self-restraint when shopping. As consumers add additional desired products to their wish lists, the importance of the desirability attributes that initially attracted them to the options may become less important, while increasing the importance of practical, feasibility attributes.

From the perspective of marketing managers, shopping cart abandonment is a pervasive challenge for online retailers. Shoppers who place products into shopping carts have expressed an interest in buying, but this often does not result in a sale. There are many reasons why consumers may decide to abandon their online shopping carts rather

than completing a purchase. This research points to one explanation, that individuals tend to focus more on desirability attributes in the first stage of the decision and feasibility attributes when re-evaluating an item for purchase. In particular, the ad reminder study illustrates one strategy for online retailers to help drive incremental sales for consumers who place items on their wish lists or use shopping carts as long-term holding areas for their potential purchases.

As a result, this research suggests that retailers would be well served by providing incentives to complete potential purchases from wish lists, saved for later lists, and abandoned shopping carts. For example, lowering the price of certain wish list items lessens the feasibility concerns, a strategy likely to be especially effective for the feasibility-dominated decision to buy an item off a wish list. A reduced focus on desirability when re-evaluating products on wish lists also suggests that customers may need to be reminded of the desirability aspects of these products. This could be accomplished by emphasizing positive product reviews from other customers, providing reminders of wish list items, and sending product reminders at certain times to emphasize the notion of treating oneself to a previously desired product.

Finally, our findings suggest that retailers who sell highly desirable products may not see a significant increase in incremental sales by offering their customers a wish list. While consumers may desire such products and enjoy putting them on a wish list, purchase likelihood may be higher without adding an extra stage to the decision. One reason behind consumers abandoning their online shopping carts is that they want to save products for later consideration (Cho, Kang, and Cheon 2006). A wish list certainly provides a method for retailers to help combat potential lost sales for consumers who

need more time to decide, but the resulting changes in the decision process that comes with re-evaluation may do more harm than good for sales. Our results suggest a potential danger of providing a wish list, particularly for highly desirable products. Wish lists are an important aspect of adding ease and convenience to the online purchase experience, and may result in greater customer satisfaction and retailer loyalty. It is also possible that consumers may be able to savor a purchase from a wish list longer than a typical purchase. In particular, if consumers re-visit the wish-listed item often leading up to purchase, or share their wish-listed item with family and friends, these actions might lead to increased savoring and relishing once the item has been acquired. However, this research suggests that the benefits of wish lists for retailers and consumers come with a tradeoff: retailers may ultimately need to work on reestablishing consumers' desire for their wish listed items in order to encourage consumers to complete the purchase.

Directions for Future Research

These results are an initial demonstration of the psychological implications of using wish lists and other purchase delay devices. As such, this research points to several opportunities for further research. Future studies could examine the long-term implications of using a wish list. Even though consumers seem to be less likely to purchase items in the short term, retailers who offer wish list may see increased loyalty and satisfaction overall. Specifically, future research should seek to understand when a two-stage decision making process can contribute to increased satisfaction. For example, once consumers have purchased an item from a wish list, will they tend to be more satisfied with that purchase relative to a more impulsive purchase?

Further research could also focus on other uses of wish lists, for instance, when consumers anticipate that another person will be making the actual purchase. There is likely to be some distinction between the types of products consumers would place on a public versus private list. In particular, research could examine the conditions under which consumers choose to signal to others that they prefer to receive more practical or more aspirational products as gifts.

Layaway is a related but separate type of purchase delay in which consumers pay over time to acquire a product. It would be interesting to see whether these payments impact goal progress and consumer decision-making. Based upon the findings in this research, paying over time should help address feasibility and also facilitate goal progress toward eventual purchase. Similarly, a pre-order is a two-stage consumption experience whereby individuals pay in advance for all or part of the order to eventually acquire an item. Paying in advance would be expected to prime feasibility (e.g., budget and price) attributes first in this case, such that people would be more likely to focus on the desirability aspects of the product once it belongs to them, leading to increased satisfaction with the purchase.

Finally, future studies could examine when consumers feel comfortable letting go of products that had previously been placed on layaway or a wish list. Research could examine when consumers might feel more of an emotional attachment to certain aspirational products, and whether this would make it more difficult to give up on the idea of purchasing items that had been previously wish-listed.

CHAPTER 3

ESSAY 2: THE UNCERTAINTY EFFECT OF CALORIES

Abstract

This research explores the impact of considering calorie information on consumers' perceptions of the general healthiness of food items. The findings contrast with conventional wisdom which suggests that as people are exposed to more calorie information, they will make more informed choices and be better able to judge the healthiness of foods. Instead, the authors demonstrate that the ubiquity of calorie information can lead most consumers to feel overly confident in using this information, thus creating an illusion of understanding calories as they pertain to food healthiness. It is proposed that consumers are often initially overconfident in their understanding of calories, but they become more doubtful once they reexamine the depth of their knowledge. Reassessing their facility with calories by evaluating calorie information can create an uncertainty effect which leads to more moderate (less extreme) judgments (i.e., unhealthy foods appear to be healthier and healthy foods appear to be less healthy). These studies provide evidence that providing consumers with more calorie information may not be widely helpful.

Introduction

Imagine two customers who walk into a restaurant for dinner. The first notices that calorie information is on the menu, but he is not on a diet and is therefore not

inclined to think carefully about calories in particular when he orders his food. Instead he has a general concern for the healthiness of the food he eats, and he tries to pick generally healthy foods. The second customer is on a diet, and she is trying to keep track of her calorie intake. She has already been thinking about the number of calories that she is about to eat, and, luckily for her, she notices that there are calorie counts on the menu. This dieting consumer reviews the calorie information and then makes a decision about how healthy a particular item appears to be. Which of these consumers will end up choosing a healthier entrée? Conventional wisdom suggests that a customer who is counting calories and paying attention to calorie information will form more accurate judgments of the healthiness of foods and make better (healthier) food choices.

Contrary to the conventional wisdom, this paper explores how the process of considering calories before judging the healthiness of foods can lead to more moderate evaluations of the healthiness of foods. In other words, thinking about calories can lead to more favorable judgments of relatively unhealthy food items and less favorable judgments of relatively healthy foods. The second customer may therefore reach very different conclusions about which food to order than the first consumer who was not evaluating calorie information. Instead of following through on her dieting plans, she may end up ordering food that is less healthy than she would have ordered in a similar situation where she had not considered calories before making her choice.

Theoretical Background

Calorie Information Paradox

Calorie information is ubiquitous. Calories are prominently displayed on nearly all food items sold in the U.S. Consumers who are grabbing food items on the go will

find calories displayed on snack foods, drinks, including soda and juices, and even on vending machine items such as candy bars. Consumers who are preparing meals at home can see calories displayed on the nutrition facts labels on packaged foods. Calories are increasingly being displayed on menus in restaurants when dining out. Most popular diet and weight-loss programs teach people to track their total calories on a daily basis when they are trying to lose weight. Children in the U.S. begin to learn about nutrition as early as kindergarten (Briggs 2010), and this education is frequently centered on learning about calories and the FDA daily recommended calorie intake.

There is a widely held belief that increased exposure to calorie information should lead to better food choices. When calorie information was mandated to appear on nutrition facts labels on packaged food products in the U.S. in 1990, the explicit aim was to improve consumers' nutrition decision making (Balasubramanian and Cole 2002; Keller et al. 1997). Rather than leading to healthier food choices, as intended, if anything, Americans' eating habits have gotten worse as calorie information has become easier to obtain. Obesity rates have continued to rise at an alarming rate (CDC 2014; Menifield, Doty, and Fletcher 2008). People still order unhealthy food items from restaurants with calorie information on menus. Some studies have shown that sales of relatively unhealthy food stay the same or even increase following mandatory calorie counts on menus (Bollinger, Leslie, and Sorensen 2010; Dumanovsky et al. 2011). After calories were posted on menu boards in New York City following local legislation, sales of some Starbucks beverages that contain a relatively high number of calories actually increased (Bollinger, Leslie, and Sorensen 2010).

There are a few possible explanations for this paradox. Some prior research findings indicate that relatively few Americans pay attention to food labels, and those who do tend to already have the inclination and knowledge to pursue a healthy diet (Drichoutis et al. 2006; Nayga 2000). In addition, people are often not very accurate in their assessments of the calories contained in certain food items (Chandon and Wansink 2007; Chernev 2011; Chernev and Gal 2010). Further, the size of the package has been shown to influence the amount of calories that are consumed (Scott et al. 2008), and these effects can differ for consumers who are chronically dieting.

This research proposes and examines an alternative account as to why providing more calorie information to consumers does not necessarily lead to healthier food choices. The theoretical account proposed here is based on an illusion of understanding which suggests that the ubiquity of calories leads to increased familiarity with this information. This familiarity, rather than facilitating consumers' evaluations of healthiness, can instead lead to overconfidence in using calorie information.

Illusion of Understanding

People sometimes understand things in far less detail than they think they do. Individuals with only a rudimentary understanding of certain phenomena may hold the belief that they possess quite detailed knowledge about these phenomena. Such a process results in a mismatch between what people think they know and what they actually know, creating an illusion of understanding. This notion has been tested previously in a series of studies examining the limitations of "folk science." In these studies, participants initially judged their explanatory understanding of devices and natural phenomena as being quite detailed, only to be greatly surprised later at their own ignorance (Rozenblit and Keil

2002). This illusion of understanding tends to be even more pronounced for explanations of how commonly encountered things (e.g., locks, watches, zippers, toilets, etc.) work than it is for general facts (Keil 2003).

For example, one study asked participants if they understood how a zipper works (Rozenblit and Keil 2002). Participants were initially asked to rate their level of understanding of how a zipper works on a 7-point scale ranging from shallow to deep understanding. Most participants indicated that the understood zippers quite well. Next, they were asked to write a detailed, step-by-step causal explanation of how a zipper works. After providing a written explanation, they re-rated how well they understood how a zipper functions. Subsequently, participants were asked to respond to a diagnostic question requiring critical knowledge about how a zipper functions. They again re-rated their understanding following this task. Finally, they read a brief expert explanation of how a zipper works and compared their understanding with this description, followed by re-rating their understanding. At each stage, participants continued to lower their estimates of what they know as they were forced to confront the limits of their knowledge.

We propose an explanation for the calorie information paradox that is based on the idea that people believe they understand calorie information better than they actually understand it. Although calories are just one indicator of the healthiness of a food item (other indicators include fat grams, sugar, sodium, fiber, etc.), calories have been found to play the largest role in how healthy food items are perceived to be (Carels, Harper, and Konrad 2006). In general, more calorie-dense foods, particularly those in fast food restaurants, tend to be less healthy and nutritious than foods with fewer calories (Story et

al. 2008). Furthermore, a calorie count is the single metric that most often appears on foods and has become the primary focus of legislative mandates (Vadiveloo, Dixon, and Elbel 2011). As such, calorie information is common and recognizable, creating a general sense of familiarity. Nevertheless, this preponderance of calorie information may actually be creating a false sense of understanding for consumers.

We propose that, in general, people may think that they understand calories, but if circumstances or personal motivation cause them to re-examine their knowledge, they can become less certain. Many consumers may think that they have a clear understanding of calories, simply because it is so common. However, if prompted to re-examine their knowledge by evaluating calories, we suggest that most non-experts will tend to have a difficult time with such a task, particularly when they are asked to estimate calories (Chernev and Chandon 2010). When forced to think more carefully about calories and how they relate to healthiness, people may become more uncertain about their knowledge, which in turn can impact their perceptions of food items.

We propose that an overemphasis on calorie information in the marketplace may be leading consumers to feel overly confident in using this information. Consumers may remain confident in their own understanding until they are forced to examine their knowledge of calories, at which point, their illusion of understanding is punctured, creating increased uncertainty.

If the illusion of understanding regarding calories exists, then anything that causes people to reexamine their level of knowledge could be expected to lead to increased uncertainty. As such, there may be multiple ways to reduce individuals' confidence in their nutrition knowledge by invoking an evaluation of calories. One way to evaluate

calories is through the act of estimation. Estimating the number of calories a food item contains is a likely part of a class of tasks that seem easy until one actually attempts it (e.g., Wänke, Bohner, and Jurkowitsch 1997). As consumers estimate how many calories are in a particular food item, they are forced to confront their actual inexperience with calorie information and may become less confident in their calorie knowledge.

Another way that consumers may become motivated to think more carefully about calories would be to evaluate the number of calories in a food item relative to other, similar items. For example, a consumer may wonder if the salad he is about to order contains more or fewer calories than most salads. If consumers are motivated to evaluate calorie information and make healthiness judgments, this re-examination of calorie knowledge may reduce the level of confidence that people have in using nutrition information to make such assessments. Likewise, consumers may simply be prompted to pay more attention to calorie information. This could happen when calorie counts appear on menus, or when calorie information is displayed more prominently on food items and thus made more salient to consumers.

Uncertainty Effect of Calories

An uncertainty explanation leads to different predictions than those of other possible theories regarding how evaluating calories may shift perceptions of healthiness, particularly when consumers first provide an estimate and are then shown actual calories. For instance, a theoretical account relying on the accuracy of estimation (Kruglanski 1989) would suggest that those individuals who are less accurate in their initial estimates of calories may be more motivated to correct for their inaccuracy in subsequent judgments of healthiness. In particular, when people are shown actual calories after

providing an initial estimate, those individuals who are more inaccurate should over-compensate for their erroneous estimates by judging healthiness more extremely. This account would therefore predict that the accuracy of calorie estimates will be correlated with judgments of healthiness.

Similarly, an anchoring and adjustment account (Tversky and Kahneman 1974) would suggest that individuals would be likely to adjust their healthiness judgments based on how their initial estimates compare with actual calories. The initial estimate serves as an anchor, but additional information in the form of seeing actual calories should lead to an adjustment from estimated toward actual calories. This account would therefore predict that individuals who initially over-estimate and are then shown the actual number of calories should rate unhealthy food items as healthier, since there were fewer calories than expected. Conversely, people who initially under-estimate and are then shown the actual number of calories should rate unhealthy food items as unhealthier, since there were more calories than initially estimated.

We instead predict that the uncertainty created by re-examining one's knowledge of calorie information influences healthiness judgments more generally. Specifically, we propose that an overall sense of uncertainty about calories, rather than an uncertainty of whether calorie estimates are accurate, relates to healthiness judgments. As such, the proposed account predicts that evaluations of food will become less extreme, or more moderate, following a decrease in confidence. More moderate evaluations imply healthier ratings for unhealthy foods and unhealthier ratings for healthy foods, thus making unhealthy foods seem relatively better and healthy foods seem relatively worse.

Certainty makes a judgment feel easier and therefore tends to lead to more extreme conclusions (Wänke, Bohner, and Jurkowitsch 1997). Conversely, increased uncertainty makes decision-making seem more difficult and thus tends to lead to more moderate assessments. This notion that confidence has an impact on extremeness of ratings and choice is supported by previous research (Jones and Davis 1965; Raghunathan and Pham 1999). For example, research on attribution theory (Newtson 1973; Ross, Greene, and House 1977) has shown that people tend to make increasingly confident and extreme trait inferences about this unusual behavior (Jones and Davis 1965). Conversely, less extreme inferences are made with less confidence by observers about more common or typical behavior. In addition, consumers who are primed with feelings of uncertainty tend to choose more moderate, risk-averse, options (Raghunathan and Pham 1999). Uncertainty therefore also tends to result in choosing less extreme, safer, options (Pham 2004).

Overview of Experiments

Seven experiments, presented next, provide evidence that perceptions of the relative healthiness of food tend to become more moderate when consumers have previously evaluated calories compared to when they have not. The first study demonstrates that estimating calories can lead to less extreme (more moderate) judgments of healthiness for unhealthy food items (i.e., unhealthy foods are judged to be healthier after estimating calories). The second study shows that this effect also occurs when individuals are simply asked to evaluate calories relative to other foods.

The third study examines the underlying mechanism of uncertainty and demonstrates that people become significantly less certain about their judgments after

estimating calories. This enhanced uncertainty fully mediates the relationship between estimating calories and healthiness perceptions.

The remaining studies find support for the proposed theory and rule out alternative explanations by examining moderators and boundary conditions on the uncertainty effect. The fourth study shows that judgments of healthiness are also more moderate for relatively healthy food items (i.e., healthy food items are judged to be less healthy after estimating calories). The fifth study shows that this effect is limited to calorie information, and not evident when people evaluate specific nutrients such as fat, carbohydrates, and sodium, which are less familiar than calories. The sixth study demonstrates that nutrition expertise moderates these judgments, and the final study shows that evaluating calorie information can also influence food choices.

Experiment 1:

The Effect of Estimating Calories on Perceived Healthiness

The goal of the first experiment was to examine the effect of calorie estimation on perceived healthiness of food items. The uncertainty effect predicts that the act of estimating calories will lead to more moderate ratings (i.e., cause a general increase in perceived healthiness of an unhealthy food such as a fast food item) relative to a similar situation in which consumers are not estimating calories beforehand. According to the theoretical account proposed, the mere act of estimating calories should cause a general sense of uncertainty about calories, shifting healthiness perceptions, whereas the accuracy of estimations, including whether participants initially over/underestimate calories, is not predicted to impact health perceptions.

Method

One hundred and ten participants (64% female with an average age of 33) were drawn from Amazon Mechanical Turk (MTurk) and randomly assigned to one of two conditions, an estimation condition and a no estimation condition. All participants were shown three different dining scenarios. The three scenarios were described to the participants as if they were walking into a popular restaurant chain and thinking about ordering a specific food item.

Food items for all participants were presented with a description of the food, ingredients, and a picture of the food item (see Appendix D for an example of the stimuli). Specific items included a grandé (16 oz.) iced vanilla latte at Starbucks, a double cheeseburger at McDonald's, and three soft steak tacos at Chipotle.

Participants in the estimation condition were first provided all of the information about each food item except the actual number of calories and were asked to estimate the number of calories of each item. They typed a numerical response to the question, "Approximately how many calories do you think (this item) contains?" Participants in the estimation condition were subsequently presented with the same description and picture of the food items, including the actual calorie count. They were then asked to evaluate the perceived healthiness of the same food item using measures of healthiness, nutritional value, and anticipated guilt. These three measures were: "How healthy do you think this food item is?" (10-point scale ranging from very unhealthy to very healthy), "How much nutritional value do you think this food item has?" (7-point scale ranging from very little to very much nutritional value), and "How guilty do you think you would feel if you ate this food item?" (7-point scale ranging from not at all guilty to very guilty). These three

questions provide converging measures of perceived healthiness, with the third question reverse-coded, and are consistent with previous research that has examined perceived healthiness of food items (Provencher, Polivy, and Herman 2009; Wansink, Cheney, and Chan 2003).

Participants in the no estimation condition were presented with all of the information about the food item at once, including the actual calorie count, and simply asked to evaluate the perceived healthiness of the same food item using the same three scales. Thus, in both conditions, participants had exactly the same information when evaluating the healthiness of the food items. The only difference was whether or not participants had estimated the number of calories prior to seeing the actual number of calories and making an evaluation.

Results

It is proposed that estimating calories will lead to more moderate evaluations of the healthiness of foods. In this case, with generally unhealthy fast food items, the expected result would be healthier ratings following calorie estimation.

Consistent with this prediction, a mixed-design ANOVA with condition as the between-subjects factor and food item as the within-subjects factor revealed that there was an overall significant main effect of estimating calories on perceived healthiness ratings, $F(3, 106) = 3.74$, $p < .05$. Participants rated the food items on average as significantly healthier ($M = 3.90$ vs. $M = 3.23$; $F(1, 108) = 6.34$, $p < .05$) and having more nutritional value ($M = 3.88$ vs. $M = 3.42$; $F(1, 108) = 4.96$ $p < .05$) in the estimation condition than they did in the no estimation condition. Participants also indicated that they anticipated feeling significantly less guilty after eating these food items in the

estimation condition (M = 3.36 vs. M = 3.97; $F(1, 108) = 5.78$, $p < .05$) than in the no estimation condition (see figure 3.1).

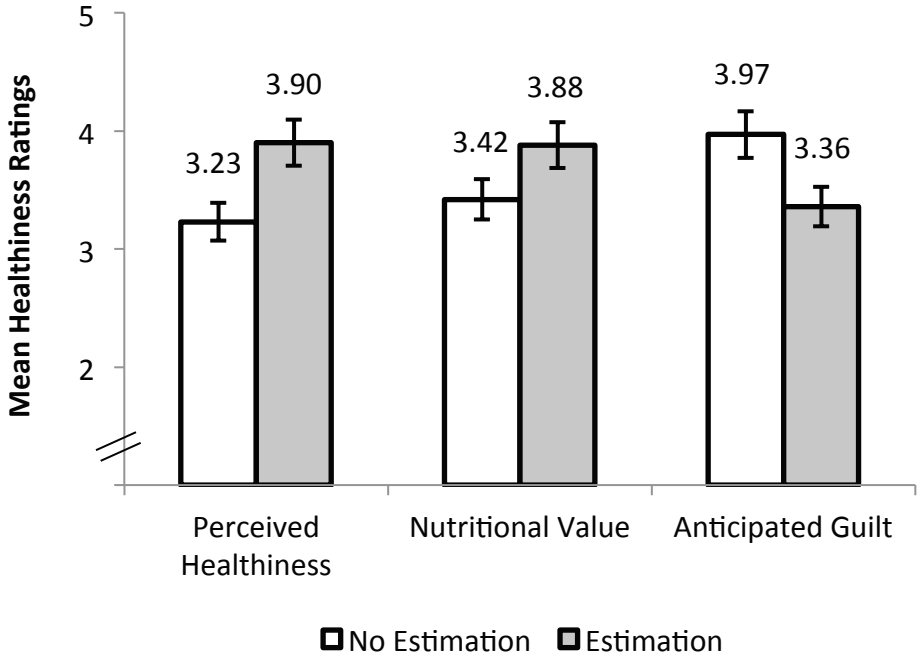

Figure 3.1. Perceived healthiness of food items.

This finding was consistent across all three foods. The interaction between food item and whether or not participants estimated calories was not significant ($F(2, 107) = 1.13$, $p = .33$). All three food items were rated significantly higher in perceived healthiness by the participants who first estimated calories.

Alternative theoretical accounts based on anchoring and adjustment or accuracy would predict that those participants who initially overestimate calories, and those who are initially inaccurate in their estimates, would view food items as healthier after viewing actual calories. The data were therefore also analyzed with regard to both the general direction of initial estimates and the accuracy of the initial estimates in the

estimation condition. On average, participants who estimated calories rated these fast food items as significantly healthier, regardless of whether they initially overestimated calories or underestimated calories. Specifically, there were significant differences in mean perceived healthiness ratings when consumers overestimated calories ($M = 3.74$) versus the no estimation condition ($M = 3.22$; $t(266) = 1.89$, $p = .05$), but also when consumers underestimated calories ($M = 4.40$) versus the no estimation condition, $t(210) = 3.00$, $p < .01$ (see figure 3.2).

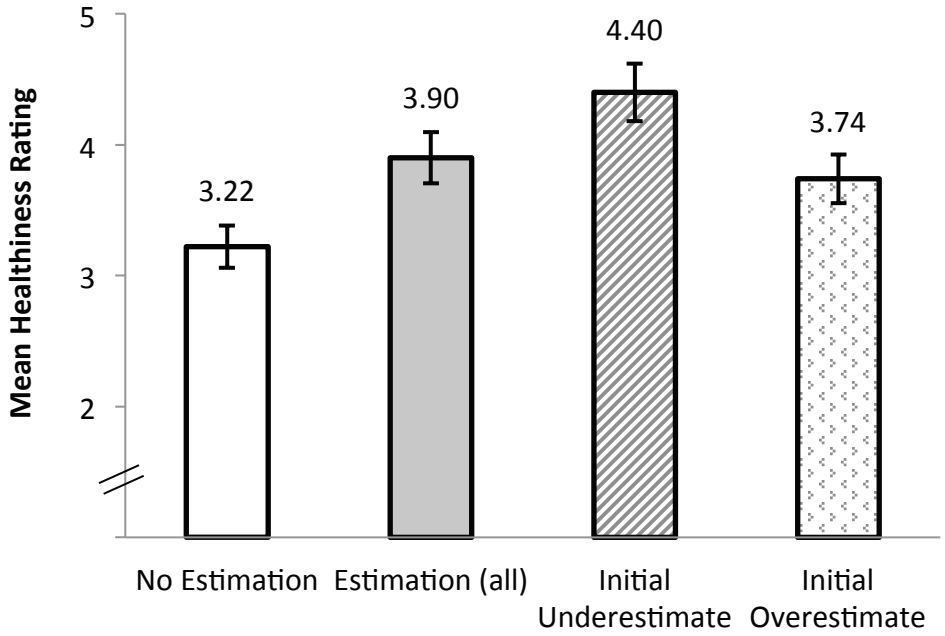

Figure 3.2. Mean healthiness ratings of food items by accuracy of initial estimate.

Further, the absolute inaccuracy of calorie estimates does not appear to lead to increased healthiness ratings in the estimation condition. Individual accuracy scores for calorie estimates were calculated by subtracting the actual calorie counts from the estimated calories. The absolute values of these deviation scores were used in a correlation with healthiness perceptions, and this result was not significant ($r = .04$, $p =$

.64). This suggests that healthiness perceptions are not driven by the inaccuracy of the initial calorie estimates.

Discussion

The data from experiment 1 suggest that prior calorie estimates impact healthiness perceptions of food items. In particular, this experiment shows that when calorie estimates along with actual calorie counts are presented to consumers, this information can significantly increase healthiness perceptions of unhealthy items.

Experiment 1 provides initial evidence that estimating calories can result in fast food items being judged as healthier relative to not estimating calories. Experiment 1 does not yet test whether other methods of evaluating calories (e.g., evaluating calorie content of a food item relative to other, similar foods) could also result in a similar effect. If uncertainty is driving the differences in judgments, then any type of evaluation of calorie information, not just the act of estimating calories, might be expected to lead to more moderate, or less extreme, ratings. This would provide stronger evidence for the uncertainty effect of calories and is tested in the next experiment.

Experiment 2:

Evaluating Calorie Content Relative to Other Foods

Evaluating calorie information is not limited to estimating the number of calories in a food item. Estimating calories is a rather straightforward way to encourage people to think carefully about calorie information, but consumers may also be motivated to pursue more incidental ways of thinking about calories, such as evaluating calories relative to other food items. The purpose of experiment 2 was to examine whether this type of

relative evaluation of calories would also shift healthiness perceptions of food items, as predicted by an uncertainty account.

Method

One hundred and twelve participants (27% female with an average age of 31) were drawn from MTurk and randomly assigned to one of two conditions, an evaluation condition and a no evaluation condition.

Similar to the first study, participants saw a description of three different food items, including their ingredients. Specific items included two tacos from Jack in the Box, a grilled cheese sandwich from Five Guys, and a cheeseburger from In-n-Out. Participants in the evaluation condition were first asked to evaluate calories for each of the three items, relative to other, similar food items. For example, when evaluating the tacos, participants responded to the question: "Compared to other tacos, do you think these items have much fewer or much more calories in them?" The responses to these evaluation questions were recorded on a 7-point scale ranging from "much fewer" to "much more," where the mid-point of the scale represents "the same."

Participants in the no evaluation condition were simply presented with a description and picture of the food item along with the actual calorie count and asked to evaluate the perceived healthiness of each item on a 10-point scale ranging from "very unhealthy" to "very healthy." Participants had exactly the same information in both conditions when evaluating the healthiness of the food items.

Results

According to an uncertainty explanation, evaluating calorie information, even relative to other food items, should cause a shift in healthiness perceptions. Specifically,

participants who evaluate calories should rate these fast food items as healthier than participants who were not first asked to think about calories.

The results of a mixed-design ANOVA with condition as the between-subjects factor and food item as the within-subjects factor indicated a significant main effect of evaluating calories on perceived healthiness, $F(1, 110) = 4.34$, $p < .05$. Participants rated the fast food items as healthier ($M = 3.28$) on average in the evaluation condition than they did in the no evaluation condition ($M = 2.78$). Again, the interaction between food item and condition was not significant ($F(1, 110) = 1.45$, $p = .23$).

Discussion

Experiment 2 provides additional evidence that evaluating calorie information relative to other foods can lead to more moderate evaluations of healthiness, similar to the act of estimating calories. The first two experiments provide converging evidence of more moderate ratings of food items, which is consistent with an uncertainty explanation. This uncertainty effect predicts that, as consumers are confronted with re-examining their knowledge of calories, uncertainty in judging the healthiness of food items tends to increase, which leads to more moderate ratings. Consumer uncertainty should therefore be expected to mediate the relationship between estimating calories and healthiness ratings. The next study will more directly test for this proposed underlying process of increased uncertainty when evaluating calorie information.

Experiment 3:

Evaluating Calorie Information Increases the Uncertainty of Healthiness Ratings

The goal of experiment 3 was to examine the underlying process of whether evaluating calorie information can increase uncertainty, resulting in more moderate

healthiness perceptions. According to the proposed theoretical account, people tend to initially feel confident in their ability to judge the healthiness of food items using calorie information, since calories are so familiar. However, once individuals are forced to re-examine their knowledge and estimate calories, they tend to become less confident in their assessments. This uncertainty, in turn, is predicted to mediate their healthiness ratings.

Method

One hundred participants (38% female with an average age of 33) were drawn from MTurk and randomly assigned to one of two conditions, an estimation condition and a no estimation condition. The manipulation was the same as the manipulation used in Experiment 1. All participants were asked to consider two different fast food items: a Big King sandwich from Burger King and a McRib sandwich from McDonald's.

Participants were asked to indicate a level of certainty in their ability to accurately judge the healthiness of food items on a scale from 1 (not at all certain) to 7 (extremely certain) at two points: both at the beginning of the study (before estimating calories in the estimation condition and prior to providing healthiness ratings in both conditions) and at the end of the study.

Results

A mixed-design ANOVA with condition as the between-subjects factor and food item as the within-subjects factor revealed a significant main effect of condition ($F(1, 97) = 6.03$, $p < .05$), indicating significant differences in healthiness ratings. Specifically, the mean healthiness rating was significantly higher in the calorie estimation condition ($M =$

2.45) than in the no estimation condition ($M = 1.79$), replicating the results of the previous studies.

The certainty ratings were significantly lower in the estimation condition after participants completed the study ($M = 4.12$), compared to when they began the study ($M = 5.12$; $t(49) = 4.95$, $p < .001$). Conversely, the before ($M = 5.44$) and after ($M = 5.46$) ratings of certainty did not differ significantly in the no estimation condition ($t(49) = -.17$, $p = .86$). This finding indicates that participants became much less certain of their ability to accurately judge the healthiness of food items after going through the process of estimating calories. This supports the theoretical account of calorie estimation as a re-examination of depth of nutrition knowledge, which leads to increased uncertainty.

A mediation analysis (Preacher and Hayes 2004) demonstrated that the second certainty rating, measured after the estimation manipulation, fully mediated the relationship between calorie estimation and healthiness ratings. The total effect of calorie estimation on healthiness ratings was significant ($\beta = -7.36$, $p < .05$). Additionally, the act of estimating calories or not significantly impacted certainty ($\beta = 1.34$, $p < .001$), which in turn impacted healthiness ratings ($\beta = -2.33$, $p = .05$). Finally, the main effect of calorie estimation on healthiness ratings was no longer significant when controlling for certainty ($\beta = -4.24$, $p = .20$); see figure 3.3.

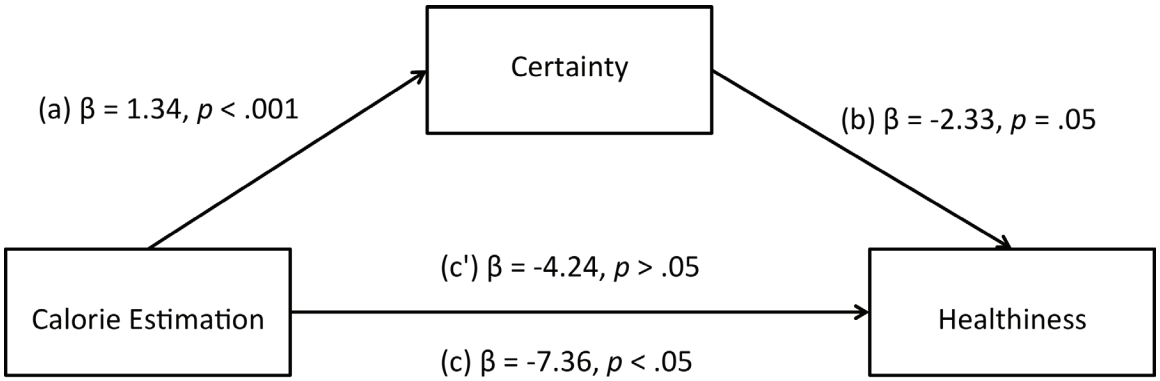

Figure 3.3. Certainty mediation model.

Discussion

Experiment 3 provides evidence that uncertainty mediates the relationship between estimating calories and healthiness perceptions. This finding supports the uncertainty effect, which suggests that people believe they possess a deep understanding of common phenomena such as calories. However, once they re-examine their knowledge level, they become significantly less confident in their ability to judge healthiness. Most people may understand that calories are somehow relevant for healthiness, but exactly how this relationship occurs seems to be much less clear for the typical consumer.

The first three experiments showed that evaluating calories can lead to less extreme ratings of the unhealthiness of unhealthy food items. However, the proposed theory predicts more moderate ratings overall and not just healthier ratings. If consumers also tend to rate generally healthy food items more moderately (i.e., as less healthy) following calorie evaluation, then this would provide stronger evidence for the proposed uncertainty mechanism. This prediction is tested in the next study.

Experiment 4:

Moderating Role of Healthy versus Unhealthy Food

The objective of experiment 4 was to test whether ratings after estimation would be more moderate for both relatively healthy and unhealthy foods. If participants' calorie estimates lead to less confident evaluations, then the evaluations of healthiness are expected to be more moderate regardless whether the food item is generally healthy or unhealthy.

Method

One hundred and thirty participants (56% female with an average age of 36 years) were drawn from MTurk and randomly assigned to one of two conditions, an estimation condition and a no estimation condition. The experimental design was similar to experiment 1 except that the four food items were presented as alternating unhealthier/healthier options, to test whether evaluations were more moderate across all foods. Experiment 4 is a 2 (Estimation vs. No Estimation) × 2 (Food Type: Healthy vs. Unhealthy) between-subjects design.

Specific food items that were evaluated in this study included a double cheeseburger at McDonald's, a 6" turkey sub sandwich at Subway, a chicken pot pie at Kentucky Fried Chicken, and a fuji apple chicken salad at Panera Bread. A separate pre-test (n = 20) revealed that, on a 11-point scale from 0 to 10 where 10 = "Very Healthy," the cheeseburger ($M = 2.6$) and pot pie ($M = 3.9$) were classified as generally "unhealthy" options, while the sub sandwich ($M = 6.5$) and salad ($M = 7.8$) were classified as significantly more "healthy" ($M_{\text{unhealthy}} = 3.25$ vs. $M_{\text{healthy}} = 7.15$; $t(39) = 15.75$, $p < .001$).

Results

A two-way ANOVA revealed a significant interaction between food type (healthy/unhealthy) and the estimation/no estimation conditions ($F(3, 516) = 163.07$, $p < .001$) on perceived healthiness ratings. Consistent with the previous experiments, participants in the estimation condition rated food as significantly healthier than participants in the no estimation condition, but only for the less healthy cheeseburger and pot pie, $t(258) = 2.85$, $p < .01$. The opposite occurred for healthier food items; participants rated the turkey sub and chicken salad as significantly less healthy in the estimation condition, $t(258) = -2.15$, $p < .05$, as demonstrated in figure 3.4.

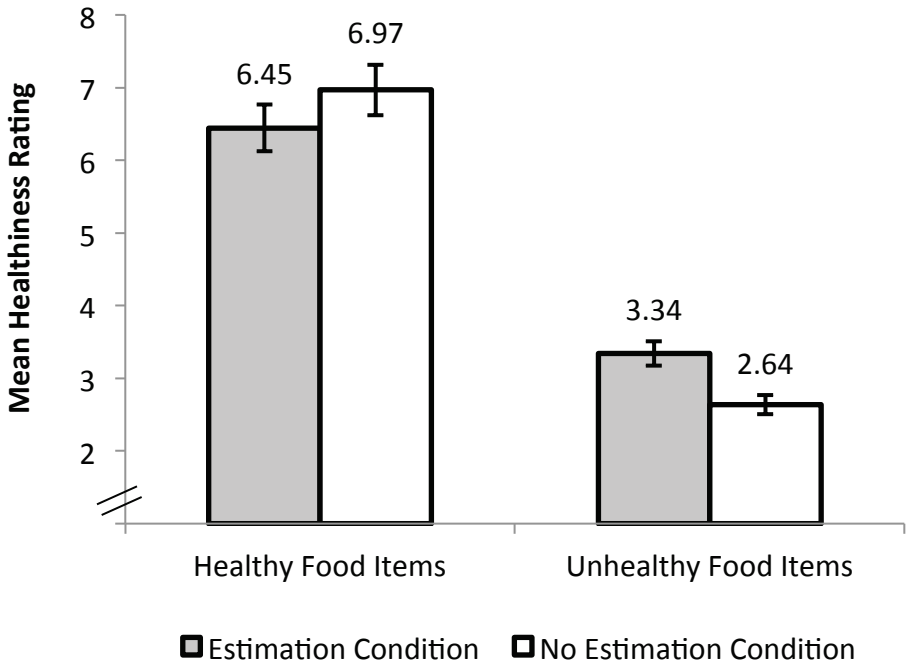

Figure 3.4. Mean healthiness ratings of food items by condition and food type.

Discussion

Participants who were asked to estimate calories were more likely to rate food items as healthier than participants who did not estimate calories, but this was only true for generally unhealthy food items. The opposite effect occurred for more healthy foods, which provides additional moderating evidence for an uncertainty explanation.

According to the theoretical account proposed, the uncertainty effect occurs when people reconsider attributes that they believe they are familiar with, such as calorie information. On the other hand, for attributes that people are less familiar with, and thus realize they do not understand very well, uncertainty is expected to not change after re-examining these already unfamiliar attributes. If this is the case, then individuals are expected to give more moderate ratings of healthiness after estimating calories, and not necessarily after estimating other nutrition information such as carbohydrates and fat, which are initially less familiar to most consumers. Experiment 5 was designed to test this hypothesis.

Experiment 5:

Moderator: Calories versus Nutrients

The objective of experiment 5 was to examine whether the uncertainty effect only applies to calories, or whether thinking about nutrients, such as carbohydrates, fat, or sodium, would similarly impact healthiness perceptions of food items. Consumers tend to be much more familiar with calories than they are with other indicators of nutrition such as fat content, carbohydrates, and sodium (Van Kleef, Van Trijp, Paeps, and Fernández-Celemín 2008). Calories are more familiar, in part, because of the prevalence of calorie information relative to other types of nutrition information.

The theoretical account predicts that when consumers estimate calories and become more uncertain about their judgments, they tend to moderate their evaluations. In particular, they evaluate unhealthy items as healthier. However, since consumers tend to be initially less familiar with other nutrition indicators, their level of uncertainty is not expected to increase, so healthiness perceptions are not expected to be impacted by first estimating the amount of various nutrients. In short, when customers initially recognize their inexperience with an attribute, we would not expect to find an uncertainty effect.

Method

Two hundred participants (38% female with an average age of 34 years) were drawn from MTurk. Participants were randomly assigned to one of five conditions, a no estimation (control) condition, or an estimation condition involving only one of the following: calories, carbohydrate grams, fat grams, or sodium milligrams. Two fast food items were evaluated in this study: a roast beef sandwich at Arby's and a chicken sandwich at Burger King.

Results

A mixed-design ANOVA with condition as the between-subjects factor and food item as the within-subjects factor revealed a significant main effect of condition ($F(4, 197) = 4.02$, $p < .01$), indicating that there were significant differences in healthiness ratings across conditions. Specifically, the mean healthiness rating was significantly higher in the calorie estimation condition ($M = 3.40$) than in the no estimation condition ($M = 2.79$; $t(78) = 2.01$, $p < .05$), replicating the results of the previous studies.

Conversely, estimating carbohydrates and fat did not have any impact on healthiness perceptions relative to the no estimation condition. The average healthiness

ratings in the carbohydrate estimation (M = 3.02) and the fat estimation (M = 2.86) condition were not significantly different from the no estimation condition ($t(78) = .63$ and $t(78) = .22$, respectively).

Estimating sodium content did have a significant effect on healthiness ratings. However, participants rated the foods as significantly unhealthier in the sodium estimation condition (M = 2.15) than they did in the no estimation condition ($t(80) = -2.01$, $p < .05$; see figure 3.5). This significant difference is still consistent with the uncertainty account, since healthiness ratings after sodium estimation are in the opposite direction (i.e., more extreme) from the same ratings following calorie estimation (i.e., more moderate).

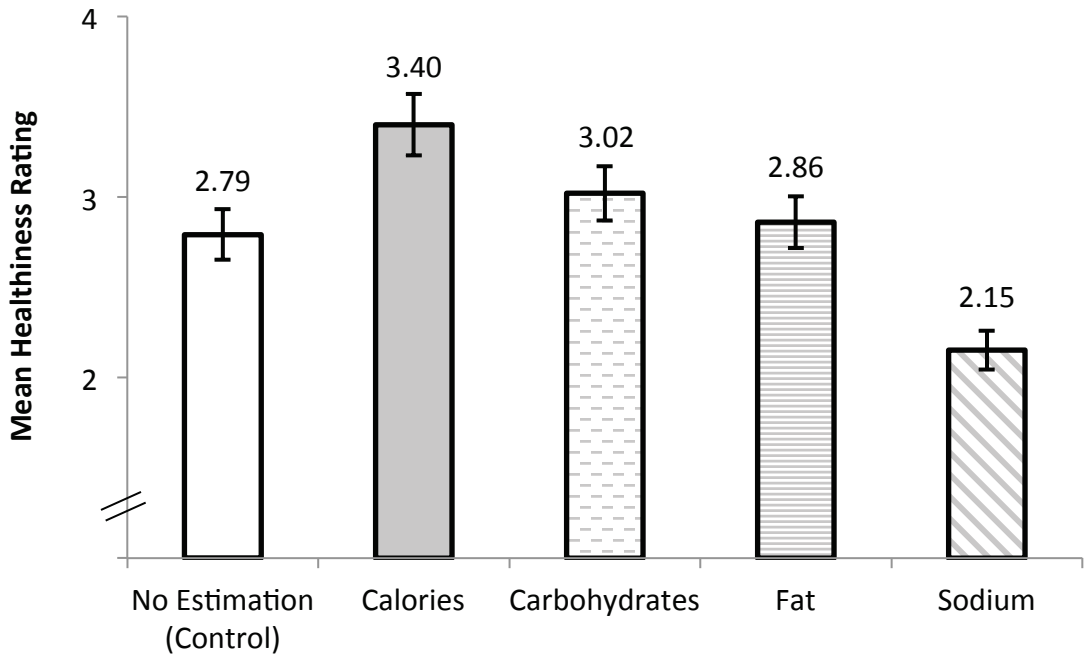

Figure 3.5. Effect of calorie content versus nutrient content.

Discussion

Experiment 5 provides evidence that consumers who evaluate calories may be prone to the uncertainty effect, whereby a focus on calories, in particular, leads to healthier evaluations of unhealthy food items. The theoretical account predicts that consumers are most familiar with calories relative to other nutrition information, and therefore they have initial confidence in their ability to understand calorie information. The findings of this study are consistent with that explanation, as the results showed that thinking about the macronutrients of carbohydrates and fat has no effect, and thinking about the micronutrient sodium has the opposite effect.

We speculate that the reason sodium may have the opposite effect, resulting in more extreme evaluations, is that there are thousands of milligrams of sodium in a typical fast food item, whereas each item contains a few hundred calories and typically less than 50 grams of carbohydrates or fat. Over 1,000 milligrams of sodium may simply sound like a large amount to consumers, and thus a food item with that much sodium appears to be more unhealthy.

Expertise plays an important role in judgments of confidence (Schneider 1995). That is, the more someone knows about a particular topic, the less susceptible they are to exaggerating the impact of any one piece of information. For this reason, expertise, or in this domain, nutrition knowledge, is expected to play an important role in the uncertainty effect of calories. Nutrition experts already know how calories impact healthiness, so asking them to make these judgments should not have an effect on their uncertainty and healthiness ratings. In short, experts are justifiably confident in their knowledge, whereas non-experts are overconfident. Experiment 6 therefore incorporates measures of nutrition

knowledge in order to ascertain whether experts are indeed less susceptible to the uncertainty effect.

Experiment 6:

Nutrition Knowledge as a Moderator

The goal of experiment 6 was to test whether nutrition knowledge moderates the uncertainty effect of calories. According to the proposed theory, expertise is expected to moderate the effect since consumers who are more nutrition-savvy should remain confident in their knowledge, even after estimating calories. People who have a lot of nutrition knowledge would be less likely to make more favorable evaluations of healthiness for generally unhealthy foods after estimating calories because they are more certain of their knowledge.

Method

Ninety participants (46% female with an average age of 32 years) were drawn from MTurk. Participants were randomly assigned to one of two conditions, an estimation condition and a no estimation condition. Specific fast food items evaluated included a double cheeseburger at McDonald's, a sausage, egg, and cheese croissant at Dunkin Donuts, an original chicken sandwich at Chick-fil-A, and a small (12 oz.) chocolate milkshake at McDonald's.

Participants in both conditions were asked to indicate their nutrition interest and knowledge by responding to five questions: "How often do you read nutrition labels?"; "How important is it to you to eat healthy on a daily basis?"; "If you indulge in eating unhealthy food on one day, how important is it to you to try to eat healthy the next day?"; "How often do you read about nutrition and diet online?"; and "How much do you know

about nutrition?" Responses to each of these questions were recorded on a 7-point scale. The five questions were combined into a nutrition knowledge index ($\alpha = .83$) for use in the analysis.

Results

Nutrition knowledge is predicted to moderate the relationship between salience of calories and healthiness ratings. A regression was performed on healthiness ratings with independent variables (i) nutrition knowledge index, (ii) a dummy variable for estimation versus no estimation conditions, and (iii) their interaction. Consistent with the findings from the previous studies, there was a main effect of estimation on healthiness ratings ($F(1, 86) = 6.79$, $p = .01$). The average healthiness rating was significantly higher in the calorie estimation condition ($M = 2.68$) than in the no estimation condition ($M = 2.18$; $t(88) = 2.11$, $p < .05$). The results also showed a significant interaction between nutrition knowledge and the estimation versus no estimation conditions ($F(1, 86) = 4.70$, $p < .05$).

A spotlight analysis revealed that for those participants with low nutrition knowledge (i.e., 1 standard deviation below the mean), fast food items appear significantly healthier in the estimation condition ($M = 3.34$) than they do in the no estimation condition ($M = 1.85$; $t(13) = 2.21$, $p < .05$). Conversely, there was no difference in healthiness ratings for those individuals with high nutrition knowledge in the estimation versus no estimation conditions ($M = 2.40$ vs. $M = 1.93$; $t(8) = .80$, $p = .45$; See figure 3.6).

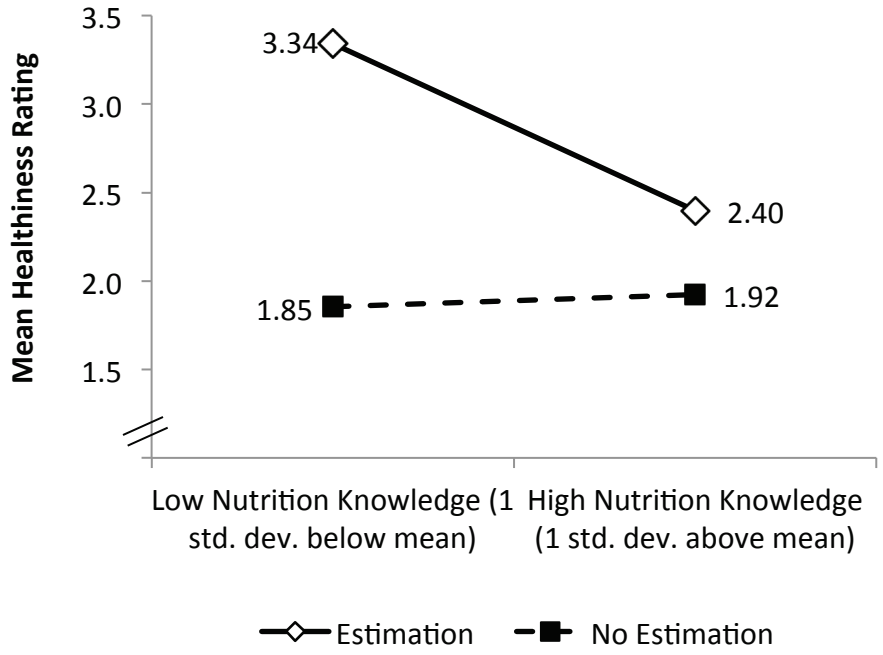

Figure 3.6. Effect of nutrition knowledge and estimation on perceived healthiness.

Discussion

Experiment 6 provides evidence that consumers who are more knowledgeable about nutrition tend to be less prone to the uncertainty effect. Individuals who possess nutrition expertise have an increased understanding of calories and healthiness, and therefore they are less likely to feel uncertain about these estimates and less likely to provide more moderate ratings of healthiness. This supports the proposed uncertainty effect of calories since nutrition experts can be expected to remain confident in their judgments, which are much less likely to be impacted by uncertainty.

The next experiment further tests this hypothesis by examining the impact of calorie evaluation on food choice. Specifically, the resulting shift in healthiness perceptions due to uncertainty will lead to healthy and unhealthy items being viewed as more similar in terms of healthiness. This reduction in the difference in perceived

healthiness between items may result in the increased likelihood of choosing a moderately unhealthy food option over a moderately healthy option when evaluating calorie information.

Experiment 7:

The Effect of Calorie Evaluation on Food Choice

The purpose of experiment 7 was to examine whether evaluating calorie information can also impact food choice. The uncertainty effect predicts more moderate evaluations overall when evaluating calories. According to this theoretical explanation and as evidenced by the prior studies, unhealthy foods appear healthier while healthy foods appear less healthy following calorie evaluation. This difference in evaluations may also lead people to be more likely to choose moderately unhealthy foods following an evaluation of calories, since foods tend to appear healthier in the face of uncertainty.

Instilling a more general sense of uncertainty about calories may be enough to create this effect. For example, even if consumers are evaluating the calorie information of foods that are unrelated to a focal choice, this evaluation may be enough to increase the uncertainty and shift healthiness perceptions of the foods that are being chosen. In other words, evaluating any calorie information may be enough to increase uncertainty.

Based on the findings of Experiment 6, we predicted that nutrition knowledge is also likely to play an important role in food choice. Specifically, people who are low in nutrition knowledge should be more likely to choose a relatively unhealthy snack when evaluating calories, since it tends to appear somewhat healthier, but they should be more likely to choose a relatively healthier snack otherwise. Conversely, people who are higher

in nutrition knowledge are less susceptible to the uncertainty effect and so they should be less likely to be swayed by calorie evaluation.

Method

One hundred and twenty-two participants (43% female with an average age of 32 years) were drawn from MTurk. Participants were randomly assigned to one of two conditions, an estimation condition and a no estimation condition. In the estimation condition, participants were first asked to estimate the amount of calories in four different snack food items. These items included a snack size bag (1.5 oz.) of Rold Gold pretzels, a snack size bag of Goldfish crackers, a snack size package of Teddy Grahams graham crackers, and one package (1.5 oz.) of Reese's Peanut Butter Cups. Participants in the no estimation condition did not evaluate these snack foods. Rather, they simply made a choice between two snacks.

In both conditions, participants were asked to choose between a Nature Valley granola bar and a bag of bite size Mini Oreo cookies. These two snack foods were unrelated to the initial items in the estimation condition. A pre-test on perceived healthiness, rated on a scale of 1 to 7 where 1 = "Very Unhealthy" and 7 = "Very Healthy" by a separate group of participants (n = 40), revealed that the granola bar was perceived as relatively healthy ($M = 5.07$) while the Oreo cookies were perceived as more unhealthy ($M = 1.80$; $t(39) = -21.46$, $p < .001$).

After making their choices, participants also responded to the same nutrition knowledge questions as in the previous experiment. The five questions were again combined into a nutrition knowledge index ($\alpha = .85$) for use in the analysis.

Results

A logistic regression revealed that there was a significant effect of condition (β = -3.67, $p < .05$) and nutrition knowledge (β = -1.68, $p < .01$) on choice. These main effects were qualified by a significant interaction between condition and nutrition knowledge (β = 0.76, $p < .05$), indicating that the effect of evaluating calories is moderated by nutrition knowledge. A spotlight analysis revealed that participants who were one standard deviation below the mean on nutrition knowledge were more likely to choose the unhealthy snack following estimation, and more likely to choose the healthier snack in the no estimation condition ($\chi^2(1) = 5.79$, $p < .05$). Specifically, the choice share of the relatively healthy granola bar went from 61% in the no estimation condition to 17% when people thought more about calorie information first. Conversely, participants in the high nutrition knowledge group showed no difference in snack choice across the two conditions ($\chi^2(1) = .27$, $p = .61$; see figure 3.7).

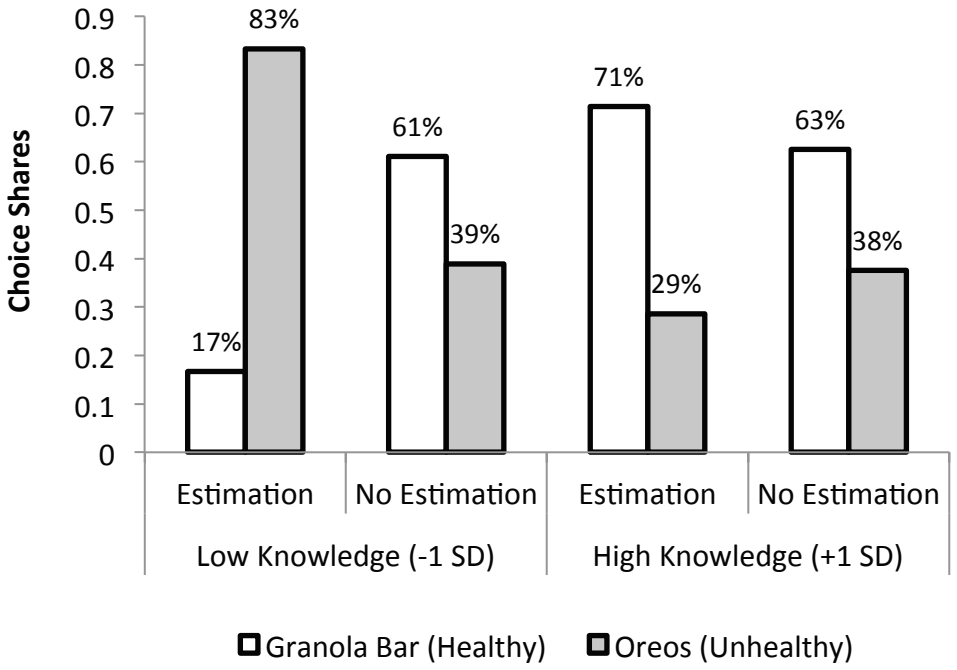

Figure 3.7. Effect of nutrition knowledge and relative healthiness on choice.

Discussion

Experiment 7 provides evidence that evaluating calories can also impact food choice, when people are given the option to choose between a relatively unhealthy and healthy snack foods. In particular, people who are lower in nutrition knowledge tend to be more likely to say they would choose an unhealthy snack following calorie evaluation than they otherwise would have. This lends additional empirical support for the uncertainty effect of calories.

General Discussion

A series of seven experiments demonstrated that evaluating calories can lead to more moderate perceptions of food and subsequently impact food choice. The mechanism driving this effect is the uncertainty effect of calories, whereby considering calories leads people to feel more uncertain about healthiness, thus leading to less extreme judgments. This phenomenon is robust across different ways of measuring, including various measures of perceived healthiness such as overall healthiness (Exp. 1-6), nutritional value (Exp. 1), anticipated guilt (Exp. 1), and snack choice (Exp. 7). We show that the uncertainty effect also occurs when people are evaluating calorie information in multiple ways across multiple manipulations, including estimation (Exp. 1, 3-6), relative evaluation (Exp. 2), and even estimating calories of food items that are unrelated to a focal choice (Exp. 7). Finally, this effect has been shown to be consistent across twenty different food items and thirteen fast food restaurant brands in these experiments. Taken together, the effect is consistent: more moderate evaluations following calorie consideration.

In the process of uncovering this uncertainty effect, a couple of alternative explanations did not receive empirical support from these experiments. Absolute accuracy of initial calories estimates did not impact healthiness assessments, and neither did initial over- or under-estimation of calories. These results indicate that accuracy does not seem to affect healthiness perceptions, as the accuracy of estimates and healthiness ratings were not correlated. Anchoring and adjustment also does not appear to explain the pattern of results observed across these studies. Participants who initially underestimated calories rated unhealthy food items as more healthy, whereas an anchoring and adjustment account would predict the opposite.

Theoretical Contributions and Directions for Future Research

This research provides several important contributions to consumer choice theory and decision-making under uncertainty. Perhaps the most interesting result is that simply thinking about calorie content seems to influence health perceptions of food. There are, of course, many individual factors that influence perceptions of food as relatively healthy or unhealthy along with several personal motivations for choosing certain food items (Carels, Konrad, and Harper 2007). However, this research demonstrates that focusing on one aspect of food, namely calories, can shift those perceptions regardless of individual differences.

These studies also contribute to our understanding of when providing calorie counts may or may not be helpful for consumers. Providing nutrition information to consumers can impact healthiness perceptions of food, and this effect depends on how the provided information is utilized and the depth of consumers' nutrition knowledge. Specifically, if lay consumers are estimating the number of calories that they may be

about to consume before ordering certain fast food items, or using calories in an evaluative sense, calorie counts may serve to moderate their evaluations, rather than swaying them to consume a healthier option. As a result, legislation that attempts to provide consumers with increased information with the intent of decreasing consumption may not necessarily be widely helpful.

There are several other types of information, in addition to evaluating calories and viewing the actual calorie content, which might also lead to increased consumer uncertainty. For example, how confident are consumers in their ability to accurately judge serving sizes? Do most people understand how to use the percent daily values for various nutrients that are provided on nutrition facts labels? Does thinking about calorie intake in terms of portion sizes rather than using nutrition information lead to more or less uncertainty? Further research in these areas will help uncover insights into which contexts may be particularly helpful for reducing consumer uncertainty.

This paper demonstrates the uncertainty effect in a nutrition context, but this particular effect is likely to be prevalent in several other domains where consumers are faced with re-examining their knowledge about products and services. For example, when dealing with price, consumers may intuitively think they have a good understanding of how much something ought to cost. If consumers were forced to think more carefully about why an item has a particular price, would they become less confident in their assessments? Similarly, if consumers were to re-examine their rationale when providing product reviews, this reassessment could possibly lead to more moderate quality and satisfaction ratings.

Implications

As evidenced by the increasing rates of obesity since nutrition labels were introduced, providing consumers with more calorie information may not be altogether more beneficial for weight management. Public policy interventions to date have been focused on providing more information to consumers. It is assumed that easier access to calorie information leads to more informed choice and better judgments. Instead, this research suggests that the commonness of calorie information may instead create a false sense of knowledge and understanding. As people become over-exposed to calorie information, they begin to assume they understand how to use this information. However, once they re-examine the depth of their knowledge, they become uncertain. Pushing calorie information at consumers is likely to increase their familiarity, but not the depth of their knowledge.

Recently, policy makers have proposed making calorie information more visible on nutrition labels in order to encourage consumers to pay more attention to this information. This research suggests that providing more calorie information and making it more salient can actually hurt, since increased uncertainty tends to result when people pay more attention to calories. In order to explore this, we conducted a separate nutrition label study to test whether making calories more salient on a nutrition label can influence healthiness perceptions, similar to estimating calories and evaluating calorie information in a relative sense. One hundred and fifty participants (37% female with an average age of 31) from MTurk were randomly assigned to one of three conditions: a “new” nutrition label condition where calories were displayed more prominently (similar to actual proposed nutrition label changes from the FDA), a “current” nutrition label condition,

and a "no label" condition (see Appendix E for example stimuli). In all three conditions, participants also saw a picture and description of three food items: two beef tacos from Jack in the Box, a grilled cheese sandwich from Five Guys, and a cheeseburger from In and Out. Results of a repeated-measures ANOVA indicated significant differences ($F(2, 147) = 6.99$, $p < .01$) such that these fast food items in the "new" label condition were rated as healthier ($M = 2.82$) than in the "current" label ($M = 2.22$) and "no label" ($M = 2.16$) conditions. There was no significant difference between the current and no label conditions ($t(98) = .32$, $p = .75$). The results of this study indicate that making calories more salient to consumers may actually backfire, leading to more moderate evaluations of unhealthy foods.

The findings from these studies suggest that nutrition judgments can be improved in at least a few different ways. First, as consumers increase their nutrition knowledge and expertise in this domain, they should be able to choose healthier options. Second, if people's calorie knowledge remains unexamined or unquestioned, they should not become as uncertain about choosing healthier foods. Finally, giving people tools that more directly map into healthiness, such as a single score of overall nutrition quality, may also help consumers improve their decision-making.

From a public policy standpoint, policy makers may need to re-evaluate the efficacy of nutrition labeling, and perhaps think about developing alternate cues for consumers to rely on. Some private companies are working toward the goal of clarifying and summarizing nutrition information in front-of-package cues. The research presented in this paper suggests that using an overall nutrition quality index that summarizes comprehensive nutritional information into a number between 1 and 100 may work better

than calories alone. Such a measure provides a more direct link between overall healthiness and perceptions of healthiness, which may reduce some of the uncertainty associated with evaluating calorie information.

In order to examine this possibility, we conducted a nutrition indicator study with two hundred participants from MTurk (35% female with an average age of 31) with four conditions: calories, overall nutrition quality index (based on the existing NuVal score used by several national grocery chains), % daily value of calories, or no calorie information. Participants were asked to rate healthiness for four snack foods: Chex mix, Nabisco Ritz Bitz peanut butter cracker sandwiches, Famous Amos chocolate chip cookies, and Odwalla pomegranate limeade. A one-way ANOVA revealed a significant effect of condition on average healthiness rating ($F(3, 196) = 2.90$, $p < .05$). Specifically, the overall nutrition quality index resulted in these relatively unhealthy foods being rated as more unhealthy ($M = 2.91$) than in the other three conditions. The calorie condition ($M = 3.48$), % daily value ($M = 3.54$) and no calorie information ($M = 3.73$) conditions resulted in significantly higher average healthiness ratings for these generally unhealthy snacks and were not significantly different from one another. If public policy makers are motivated to help people make heathier food choices, then one of the steps toward this goal would be to encourage people to perceive generally unhealthy food items as unhealthy, not healthier.

The results of the nutrition indicator study provide some preliminary evidence that an overall nutrition score may be able to help reverse the effects of the uncertainty effect of calories. An overall nutrition score may be a clearer indicator of the actual

nutritional content of food, thus leading to less uncertainty and making it easier for consumers to provide judgments of healthiness.

Food manufacturers who choose to voluntarily display calorie counts on the front of their packaged goods should understand how consumers are using this information when they pay attention to it. From a food marketing perspective, manufacturers may need to place less emphasis on highlighting one or more particular nutrition metrics on the front of packages. More calorie information on packaged goods may backfire toward the aim of encouraging people to lose weight and eat healthier. Highlighting any one nutrition metric can be counterproductive, as was evidenced by the low-fat craze during the 1990s. Rather than improving the American diet, increased consumption of low-fat products resulted in increased obesity (Samaha et al. 2003).

Because these studies demonstrate that the uncertainty effect is less likely to impact nutrition experts, consumers may need further education about which foods are generally healthier, rather than relying on nutrition labeling, but this would take effort on their part. Consumers who seek out calorie information and track their dietary intake should have a strong working knowledge of nutrition and should focus on their diets more holistically. In general, all stakeholders may wish to take a broader perspective and a more holistic approach to healthier lifestyles, including improved eating patterns.

There is overwhelming support from the government and in the media for continuing to provide consumers with increased information related to nutrition and health. In particular, many legislators wish to mandate the posting of calorie counts in restaurants and make calorie information more prominent on packaged foods. Conventional wisdom and common sense suggest that providing consumers with more

information should, in fact, lead to healthier choices. However, these studies provide evidence that more information can lead to increased uncertainty and instead moderate consumer perceptions of the healthiness of food items.

CHAPTER 4

ESSAY 3: HOW SOCIAL INFLUENCE CAN HINDER GOAL PURSUIT

Abstract

Society is filled with examples of the purported benefits of pursuing goals in a group setting. Contrary to the conventional wisdom, this research examines the effect of social influence on goal progress and proposes that there are situations when pursuing goals in a group situation may be less effective than pursuing those same goals alone. The findings complement prior research demonstrating how social goal pursuit can be beneficial for the initiation of goals. In particular, when individuals become more focused on the social aspects of their goals, this can take focus away from their own individual motivation and progress. People tend to be more likely to focus on others' progress in a social goal context, which can eventually lessen motivation to sustain one's own goal progress and lead to increased dishonesty, depending on one's primary motivational orientation (intrinsic or extrinsic).

Introduction

Society is filled with examples of purported benefits of pursuing goals in a group setting. For example, Weight Watchers is a widely-used weight-loss program that encourages participants to attend "peer powered" meetings to get support with their weight-loss goals. *The Biggest Loser* is a popular television show that has aired in over 25 countries around the world and tracks overweight contestants who are typically

working toward a weight-loss goal in a group setting. There are numerous smartphone apps and websites that can be used for setting and tracking goals, many of which include options to work toward similar goals along with other people. Wearable fitness trackers allow individuals to keep track of steps, calories burned, and compare this activity to that of others. Social networking sites have been set up to help smokers kick the habit. Even 12-step programs for overcoming substance abuse and other dependency problems advocate a group orientation toward recovery.

This research examines the effect of social influence on goal progress and proposes that there are times when pursuing goals in a group situation may be less effective than pursuing those same goals alone. When individuals become more focused on the social aspects of their goals, this can sometimes take focus away from their own individual motivation and progress. It is important to examine a more nuanced explanation for successful goal pursuit because our intuition to most often advocate the benefits of pursuing goals in a social setting may be incomplete and misleading for certain people.

This paper is organized as follows: A review of prior research leads to the prediction that increased focus on social aspects of goals will initially increase motivation but also decrease focus on individual progress in a social goal situation. This decreased focus on individual progress can not only detract from the inclination to continue to pursue a goal, due to decreased confidence, but it can also result in increased dishonesty regarding one's own goal progress. In addition, a person's primary motivational orientation (intrinsic or extrinsic) is predicted to moderate the relationship between goal context (individual vs. social) and continued motivation/potential for dishonesty. The paper concludes with a discussion of the theoretical and practical implications.

Theoretical Background

The psychology of social influence can be quite powerful in causing behavior change, particularly when we follow the lead of similar others (e.g., Cialdini 2008; Festinger 1954; Goldstein, Cialdini, and Griskevicius 2008). Social factors, such as the presence of others, can help us initiate goal pursuit. Studies have found that reminding people of significant others can help them activate goals associated with those others (Fitzsimons and Bargh, 2003). Individuals often use their perceptions of peer behavior as a standard of comparison for themselves (Schultz et al. 2007). Familiarity helps enhance social influence such that friends' influence tends to be stronger than that of strangers, and group settings have higher social influence than more solitary settings (Cialdini and Goldstein 2004).

Previous research has demonstrated a few different ways that the social environment can facilitate the monitoring of behaviors. Our food choices, for example, have been shown to be influenced by those around us (McFerran et al. 2009). Pairs of people who are similarly high in self-control tend to make less indulgent choices (Dzhogleva and Lamberton 2014). Thinking of helpful others may heighten social pressure, which could enhance goal pursuit behaviors (e.g., Urdan and Maehr 1995).

Social Influence Can Facilitate Goal Progress

Prior research has demonstrated that social support from significant others can facilitate people initiating goal pursuit (Fitzsimons and Bargh 2003; Fitzsimons and Finkel 2010). Even the act of observing other people's actions can prompt an individual to begin working toward a goal (Aarts, Gollwitzer, and Hassin 2004). Social support has been shown to facilitate certain health behaviors, and even the mere perception that

support is available can be helpful for improved health outcomes (Uchino 2004). People who join health-based social networking sites seem to be able to quit smoking and abstain for longer periods of time because of the sense of community they build with other members (Phua 2013).

Pursuing a goal in a group setting can therefore facilitate starting a goal along with monitoring goal progress and thus may be expected to provide an initial boost in motivation. Thinking about other people who are working toward the same goal may also increase social pressure and commitment to the goal, which could enhance motivation (e.g., Locke, Latham, and Erez 1988). People often expect that making a public commitment to their goal can be quite helpful in motivating them to achieve it. Thus, conventional wisdom seems to support the notion that social influence enhances goal progress not just initially, but also over time. There are numerous instances of support groups that are set up to help their members achieve their goals. The hope seems to be that a person might originally get exposed to an activity because of social others and then such exposure could allow the person to eventually experience a shift to intrinsic motivation. While such a shift in motivational orientation is possible (Ryan and Deci 2000), it may not happen for most individuals unless they eventually begin to internalize the goal and feel genuine competence in their ability to achieve it. Some people may be more or less susceptible to social cues in a goal pursuit context, depending on their motivational preferences.

Motivation helps individuals energize, direct, and sustain their behaviors (e.g., Ryan and Deci 2000; White 1959). People vary not only in how much motivation they exert toward an activity but also in the underlying type of motivation they possess, known as

their motivational orientation. Motivational orientation is often conceptualized as a stable individual trait, but it can also be viewed as being situational, depending on a particular context (e.g., Harter and Jackson 1992). Intrinsic motivation comprises internal desires to perform a particular task; people do a certain activity because it gives them satisfaction and is inherently interesting or enjoyable (e.g, Deci and Ryan 1985). Extrinsic motivation, on the other hand, is external to the individual and unrelated to the task that is being performed. Examples of extrinsic motivation include working toward rewards or recognition (e.g., Amabile et al. 1994). Extrinsically motivated behaviors are often not inherently interesting and are typically externally prompted in order to satisfy a demand or obtain a reward that is contingent on performance. One type of extrinsic motivation especially relevant to this research is the desire to feel connected to their social others, whether that be family members, a peer group, or society in general (Ryan and Deci 2000).

Social Influence Can also Hinder Goal Progress

The initial motivational increase of social influence may be more short-lived than the conventional wisdom dictates, particularly as people may become more likely to engage in comparison behaviors. For instance, approximately forty percent of people using fitness-trackers, which are often promoted based on their ability to facilitate positive social influence in exercise behaviors, cease to use them within the first year, according to The NPD Group, a market research firm (NPD 2014).

There have been very few studies that have examined the potential downside of social goal pursuit, and those that do have tended to focus on whether peer health behaviors can impact one's own health behavior. In one study, John and Norton (2013)

found that office workers using treadmills made less progress when they were assigned to groups than when they were not given any social feedback. In another study, researchers found significant peer effects on fitness level (Carrell, Hoekstra, and West 2011), also supporting the idea that poor physical fitness is more likely to be driven by friends who were the least fit.

Similarly, research on social norms has examined what happens when people use "average" behavior as a benchmark for their own. In this setting, messages that emphasize social norms have been shown to be rather ineffective and in some cases have even resulted in increased prevalence of undesirable behaviors such as binge drinking (e.g. Perkins, Haines, and Rice 2005; Werch et al. 2000) and overuse of electricity (Schultz et al. 2007). Therefore, emphasizing peer behavior as a comparison standard for one's own behavior may sometimes backfire in certain contexts.

Simply having helpful people around to assist with goal pursuit can undermine one's motivation to exert effort toward that goal. Fitzsimons and Finkel (2011) found that people tend to have less motivation when they thought about a partner to who could help them with a goal. Individuals tended to exert less effort to achieve a goal after considering the ways in which a significant other could be helpful. In this case, the individual was more likely to rely on this significant other and exert less self-directed effort.

While such studies highlight that there may be potential downsides to social influence in goal pursuit, and social comparison in particular, they do not directly assess whether motivation levels can persist with chosen goals in a group or individual context.

Nor do these studies assess how one's motivational orientation (intrinsic vs. extrinsic) can help or hinder goal pursuit in a social versus individual context.

Importantly, extrinsic motivation has been shown backfire under certain circumstances. For example, introducing an extrinsic penalty (a fine) increased the number of parents who arrived late to pick up their children at a daycare center, rather than acting as a mechanism to help curb the lax behavior of these late-coming parents (Gneezy and Rustichini 2000). A number of studies have demonstrated that offering external prompts or tangible rewards for an already internally rewarding behavior can actually lead to a reduction in intrinsic motivation, a phenomenon known as the overjustification effect (e.g., Deci 1971; Heyman and Ariely 2004; Kruglanski, Friedman, and Zeevi 1971; Lepper, Greene, and Nisbett 1973). In one study, for example, children who were rewarded for playing with a toy they had already expressed interest in playing with became less interested in the item after being externally rewarded (Lepper and Greene 1975).

People who are intrinsically motivated often experience their behavior as self-determined (i.e., as determined by their own choice), and thus feel higher levels of self-efficacy and competence in their ability to finish the task at hand (e.g., Zuckerman et al. 1978). We therefore predict that intrinsically motivated individuals will be more likely to experience higher confidence and persist with their goals in the face of expected social feedback.

Extrinsically motivated individuals have a tendency to blame others for their lack of progress (Ryan and Connell 1989). They tend to demonstrate more anxiety and poorer coping with failures, and competition pressure can diminish motivation when people tend

to feel as though they have less control over the outcome (Reeve and Deci 1996). Thus, we predict that extrinsically motivated individuals will have lower motivation when they engage in social comparison while pursuing goals. In particular, receiving negative feedback (e.g., that they are performing worse than others) should decrease the motivation of individuals with extrinsic motivation.

Potential for Dishonesty

In addition to the potential for social factors to cause a decrease in motivation for extrinsically-motivated individuals, we predict that people who are less motivated may also be less truthful about their progress. We suggest that increased dishonesty will result when people are trying to bolster their confidence. Self-deception can have short-term benefits, and previous research lends support for our prediction that dishonesty will be used to temporarily boost confidence in one's ability to pursue a chosen goal. In one study, for example, students who had been given the opportunity to cheat on an exam overestimated their ability to perform well on a follow-up test, despite knowing that they would not be given a similar opportunity to cheat a second time (Chance, Norton, Gino, and Ariely 2011). In essence, the students who were able to cheat on the first test had inflated beliefs in their own abilities to perform well on the second test. This research finding directly supports the notion that dishonesty can have self-enhancing benefits. Dishonesty is more likely when people can reinterpret their behaviors in a self-serving manner (Mazar, Amir, and Ariely 2008). We therefore argue that dishonesty can be used strategically in the context of goal pursuit in order to boost confidence and counteract decreased motivation.

Individuals may be less truthful when they want to make themselves appear more socially desirable (Gino, Ayal, and Ariely 2009). Therefore, we predict that extrinsically motivated individuals will be more likely to be dishonest when pursuing goals in a context with friends, allowing their significant others to view their self-enhancement. Conversely, intrinsically motivated individuals will be more likely to be dishonest in an goal context with strangers, boosting their self-confidence in continuing to work toward the goal. The degree to which participants might be dishonest about tracking their progress should be expected to coincide with the extent to which they can justify this level of dishonesty (Shalvi et al. 2011). If individuals tell themselves that they will be able to make up for their lost progress another day, for example, this provides them with a more justifiable reason for dishonesty.

Empirical Tests

Since there is evidence in the literature for two competing predictions, that social influence may facilitate goal progress but also that social influence, and social comparison in particular, may hinder goal progress, this research seeks to understand some specific conditions under which one may be more likely than the other. Based on the social influence, motivational orientation, and dishonesty literature, we predict the following: Individuals who are pursuing a goal in a social context (e.g., with friends or in a group) will be more motivated initially to work on their goal, but will become less motivated over time, relative to individuals in a more individual goal pursuit context (e.g., with strangers). This decreased motivation in a social goal context is predicted to be largely due to social comparison, which adversely impacts goal progress because people are more focused on what others are doing rather than tracking their own progress.

Continued motivation and dishonesty in these two goal pursuit contexts are further predicted to be moderated by an individual's motivational orientation (intrinsic vs. extrinsic). In particular, extrinsically motivated people tend to experience lower motivation over time due to social comparison, and this relationship is predicted to be mediated by confidence, since social comparisons can decrease confidence in one's ability to continue to work toward the goal. People who are lower in motivation are therefore predicted to be more likely to engage in dishonesty, in an attempt to temporarily bolster their confidence.

These predictions were tested in a series of five studies. The first study uses a secondary data set of weight loss over time. This data provides a unique setting where individuals are working toward their goal in either a social context or an individual context and allows us to examine their goal progress over time. Next, we turn to experimental data in order to demonstrate the underlying motivation and process which can lead to such differences across contexts. Study 2 shows one important reason for these differences: individuals tend to engage in social comparison by paying more attention to others' progress in a social goal context. Study 3 demonstrates that continued motivation is much more likely for those who are intrinsically motivated. Study 4 examines this continued motivation over time and finds that extrinsically motivated individuals are lower in continued motivation, and this relationship is mediated by confidence. Study 5 demonstrates that people are also more likely to be dishonest about their goal progress when they are lower in motivation. This increased dishonesty seems to be used strategically by individuals in order to help boost confidence to counteract their

decreased motivation. The paper concludes with a discussion of the theoretical and practical implications.

Study 1:

An Examination of Social versus Individual Goal Progress

The purpose of the first study was to examine goal progress using secondary data collected in a situation where individuals are advancing toward a weight-loss goal in both a social context that is high in social influence and an individual context with lower social influence. If conventional wisdom is accurate, then people who are working toward a goal in a social setting should have a continued advantage over time to those who are working on the same goal in a more individual setting.

Conversely, if those who are working toward the same goal in an individual context are able to sustain motivation longer than those in a social context, then goal context should significantly interact with progress over time. In particular, people who are working toward a similar goal in a similar way should show more progress initially in a social context, but later perform worse, relative to those in an individual context.

Method

Weekly weight loss data was collected from the third season of the popular television show, *The Biggest Loser*. In this particular season of the show, 16 participants worked toward their weight-loss goal in a social context (i.e., on *The Biggest Loser* ranch), while 36 participants worked on the same goal at home in a more individual, self-directed, setting (i.e., at home).

The Biggest Loser tracks the weight-loss goal progress of overweight and obese individuals who are competing to win a cash prize. The person who loses the highest

percentage of weight relative to their initial weight is declared the winner at the end of the season. Contestants weigh in each week to record their progress. These contestants have access to personal trainers and medical personnel who design comprehensive workout and nutrition programs for them while they are on the ranch. The contestants are responsible for implementing these plans and following through on their exercise and nutrition.

If the conventional wisdom is accurate, then we should expect those participants on the ranch to perform better due to social influence and support. Participants on the ranch have celebrity trainers, a rigorous schedule, dieting plan, a convenient gym, and all of the support that comes with such an arrangement, as opposed to working out at home. Once contestants return home, they return to their daily lives, jobs, family, and other obligations.

Weekly weigh-in data was collected for both groups over the course of twelve weeks. This data set included the starting weight, gender, and height of each participant. The data set also included which trainer worked with each participant on the ranch, and the total number of weeks spent on the ranch, since participants were asked to leave the ranch and return home at different times, based on their weekly weigh-in performance.

Results

Descriptive statistics revealed that the starting weight of participants at home (by themselves; $M = 282.9$) and on the ranch (with others; $M = 296.8$) did not differ significantly ($t(50) = -0.77$, $p = .44$). Next, a cross-sectional time-series analysis, using generalized estimating equations (GEE) with auto regressive correlation structure and lag

one (AR(1)) to account for the repeated measures that are equally spaced over time (Hamilton 1994; Velicer and Fava 2003), was conducted with the following structure:

$$y_{ij} = \boldsymbol{x}'_{ij}\beta + \gamma y_{i-1,j} + \epsilon_{ij}$$

An AR(1) model with all available control variables revealed a significant location by week interaction (β = 1.80, z = 3.00, p < .001), which suggests that there was a different rate of weight loss between the home and ranch participants across time. On average, participants on the ranch lost weight more quickly during the first few weeks, while participants at home lost weight more quickly during later weeks (see figure 4.1). However, there was not a significant main effect of location (β = -0.73, z = -0.15, p > .10), which suggests that losing weight in a social environment was not overall significantly better than losing weight in a more individual environment.

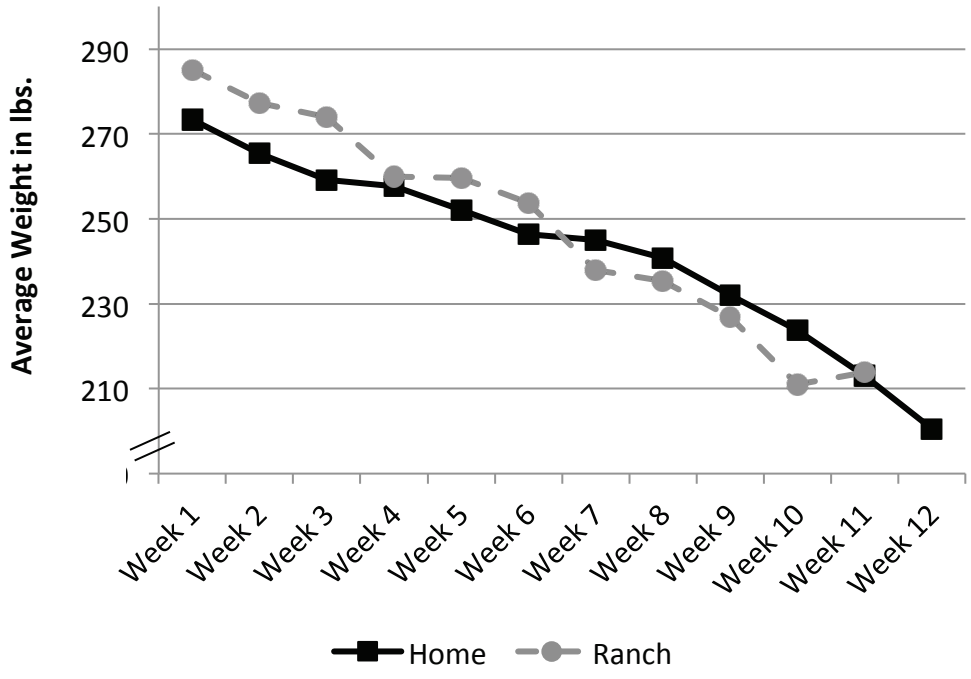

Figure 4.1. Individual versus social goal progress on *The Biggest Loser*. All contestants were sent home by the season finale (week 12).

These results did not differ significantly from a reduced model with fewer control variables (see table 3). Participants lost about 7 pounds each week when controlling for starting weight, location, and number of weeks on the ranch. Furthermore, the average weight at the season finale did not differ significantly between the at-home contestants (M = 206.6) and the ranch contestants (M = 187.3; $t(50) = 1.36$, $p = .18$).

Table 3. Time-series analysis of goal progress on *The Biggest Loser*

Variable	Full AR(1) model with control variables	Reduced AR(1) model
Starting weight	β = 0.85, z = 13.44 ***	β = 0.79, z = 24.65 ***
Location	β = -0.73, z = -0.15	β = -0.40, z = -0.08
Week	β = -6.78, z = -21.14 ***	β = -6.77, z = -21.04 ***
Number of weeks on ranch	β = -2.87, z = -3.24 ***	β = -2.63, z = -4.61 ***
Gender	β = 2.31, z = 0.37	
Trainer	β = 2.19, z = 0.37	
Height	β = -0.82, z = -0.94	
Location x Week	β = 1.80, z = 3.00 ***	β = 1.77, z = 2.96 ***

Note: *** $p < .001$.

Discussion

Contrary to conventional wisdom, these weight-loss participants made more progress toward their goal at home (individual context) than they did on the ranch (social context) in later weeks. These results are particularly noteworthy, given that the participants on the ranch have additional tools and incentives to make progress toward their weight-loss goal, in addition to being in a social context (e.g., working with celebrity trainers and having television cameras constantly documenting their progress).

This analysis provides an initial comparison of goal pursuit in a social context versus a more individual context using secondary data. This data does not allow us to examine the participants' underlying reasons for working on their weight loss goal. Some

participants may be competing for the cash prize or the chance to be on television, while others may be more interested in losing weight to become healthier, for example. In order to more fully explore the impact of a social context on goal progress, the following experiment examines whether people pay more attention to others' progress in a social goal situation. If, as theorized, social comparison can sometimes hinder goal progress, then paying more attention to others' progress may increase initial motivation but later become detrimental and decrease continued levels of motivation when individuals are working toward a goal.

Study 2:

The Impact of Social Influence on Attentional Focus

The goal of study 2 was to examine whether people would pay more attention to others' progress in a social goal situation. According to the theoretical account proposed, people are expected to be more likely to focus on others' progress in a high social influence context (with friends), relative to a context lower in social influence (with strangers), while pursuing similar goals.

Method

One hundred students (64% female with an average age of 21) participated in this experiment along with several unrelated studies at a large American university. Participants were randomly assigned to one of two conditions, a goal context with either friends (high social influence) or strangers (low social influence) present. In both conditions, participants were first asked to think of a goal that they would want to pursue and were asked to select a goal from six listed options (save money, exercise, lose weight, get more sleep, meditate, be more productive) or an "other" option that included

an open-ended text box. Respondents were asked to imagine that they would be tracking their goal progress on a website called mygoaltracker.com. The website description indicated that participants would either be pursuing similar goals with their friends (friends condition), or participants would not know any of the other website participants (strangers condition).

The website was further described as having two prominent tabs when users first log-in: a "Log Your Progress" tab (to record one's own progress) and a "User Activity" tab (to view the progress of others). Following the goal choice and website description, participants were asked to indicate which of the two tabs they would be more likely to click on when they first logged in to use the site. They were also asked to provide a brief reason as to why they would be more likely to click on their chosen tab using an open-ended response. Participants were asked to indicate their continued motivation by responding to the question: "If you noticed that [your friends (friends condition)/other users (strangers condition)] of the website were making much more progress than you were toward a particular goal, would you be more or less motivated to continue working toward that goal?" using a 7-point scale where 1 = "much less motivated" and 7 = "much more motivated." Finally, respondents indicated their age, gender, and the extent to which they agreed with a goal orientation trait statement, "I am a person who enjoys setting goals and working toward them," on a 7-point scale ranging from "not at all like me" to "just like me," which was used to assess intrinsic motivation.

Results

A chi-square analysis revealed that significantly more participants indicated they would click on the "User Activity" tab than the "Log Your Progress" tab in the friends

condition ($\chi^2(1) = 4.96$, $p < .05$), indicating that they were more interested in seeing how their peers were performing than recording their own progress. The specific types of goals that participants chose did not differ significantly between the friends and strangers conditions ($\chi^2(6) = 7.25$, $p > .05$).

A linear regression revealed that participants who rated themselves as higher on the goal setting trait statement were significantly more likely to say that they would be more motivated to use this website ($\beta = .35$, $p < .05$), even if their friends (friends condition) or other users (strangers condition) were making much more progress than they were on the particular goal that they chose. This result indicates that intrinsically-motivated people who enjoy pursuing goals are more likely to continue to use the website in the face of social comparison.

The open-ended responses of why participants would be more likely to click on a certain tab were coded and analyzed. Two independent coders with an inter-rater reliability of 91% classified responses as mentioning decision reasons related to a self-focus (e.g., concern for self, log my own progress, avoid comparison) or other-focus (e.g., comparison, competition, social support). A chi-square analysis of the data revealed that participants mentioned significantly more other-focus attributes when choosing the "User Activity" tab (92%) and more self-focus attributes when choosing the "Log Your Progress" tab (95%; $\chi^2(1) = 74.35$, $p < .001$). The results demonstrate that, in general, people pay more attention to others' progress in a social goal context with friends than they do in a more individual goal context with strangers. A social goal context seems to evoke a mindset that is focused more on comparison to others, whereas a goal context with strangers seems to promote a more self-directed mindset.

Discussion

This study provided evidence that participants were more likely to focus on others' progress in a social goal context. However, the idea that intrinsic motivation (using a simple trait measure of goal setting behaviors) can predict continued motivation should be tested more thoroughly. Intrinsic and extrinsic motivational orientations are typically examined together, and this study did not include any measure for extrinsic motivation. In particular, people who are more intrinsically motivated (rather than extrinsically) may be more likely to continue tracking their goals in the face of feedback and comparisons of significant others, since they are more driven by their own achievements and less concerned with the feedback of others. If this is the case, then an intrinsic motivational orientation would be expected to impact goal pursuit differently than an extrinsic motivational orientation in a goal context with friends versus strangers. This prediction was tested in the next study.

Study 3:

Motivational Orientation as a Moderator of Social Influence

The goal of study 3 was to extend the findings of study 2 by examining whether intrinsically or extrinsically motivated individuals would be more likely to persist with their goal pursuit in a social goal context with friends. It makes intuitive sense that people who are more extrinsically motivated would reap the most benefit from using a goal pursuit format that is more socially driven. However, in order to sustain motivation despite social comparisons, people who are intrinsically motivated may actually benefit more since they tend to feel more self-efficacy in the face of expected social feedback. Intrinsically motivated people are predicted to be able to remain focused, but only when

they expect social comparisons to occur (in the friends condition). Receiving unwanted feedback in the strangers condition could result in an over-justification effect, whereby intrinsically motivated people instead become less motivated.

Method

Two hundred adult participants (37% female with an average age of 33) from the United States were drawn from Amazon's Mechanical Turk (MTurk) and randomly assigned to one of two conditions, a friends condition or a strangers condition. The design of the study was similar to the previous study whereby participants were told that they would be tracking their goal progress on a website called mygoaltracker.com. The website description indicated that participants would either be pursuing similar goals with their friends (friends condition), or participants would not know any of the other website participants (strangers condition). Participants responded to the same 7-point initial motivation and continued motivation measures from Study 2 and indicated their age and gender.

In addition, respondents were asked to indicate to what extent certain measures described how intrinsically or extrinsically motivated they were on a scale from 1 to 7 where 1 = "not at all like me" and 7 = "just like me." These measures were an eight-question subset of the Intrinsic Motivation (IM) scale (α = .68) and the Extrinsic Motivation (EM) scale (α = .72) from the Work Preference Inventory (Amabile, Hill, Hennessey, and Tighe 1994; See Appendix F). An average IM score and an average EM score was calculated for each individual. A median split was then performed on these scores (Iacobucci et al. 2015) in order to form groups of high and low for both intrinsic (Mdn = 4.50) and extrinsic (Mdn = 4.00) motivation. Finally, these median split scores

were used to create a measure of primary motivational orientation for each participant of (high) intrinsic (32% of participants), (high) extrinsic (27% of participants), or neither (41% of participants).

Results

The main finding of the previous study was replicated. The results of a one-way ANOVA with motivation to use the website as the dependent variable and condition (friends vs. strangers) as the independent factor showed that there was a significant difference in how initially motivated participants indicated that they would be to use this particular goal-setting website between the two conditions ($F(1, 118) = 43.81$, $p = .05$). Overall, participants indicated that they would be slightly more motivated to use the website in the friends condition ($M = 5.12$, $SD = 1.34$) than in the strangers condition ($M = 4.90$, $SD = 1.42$). The demographic variables of gender and age did not significantly predict motivation to use the site.

A two-way ANOVA with condition (friends vs. strangers) and the primary motivational orientation measure (intrinsic or extrinsic) revealed there was a significant interactive effect on continued motivation to use the site despite others' progress ($F(2, 195) = 3.25$, $p < .05$). A post-hoc test indicated that the marginal means were significantly different between conditions for the intrinsic group but not for the extrinsic group (See figure 4.2).

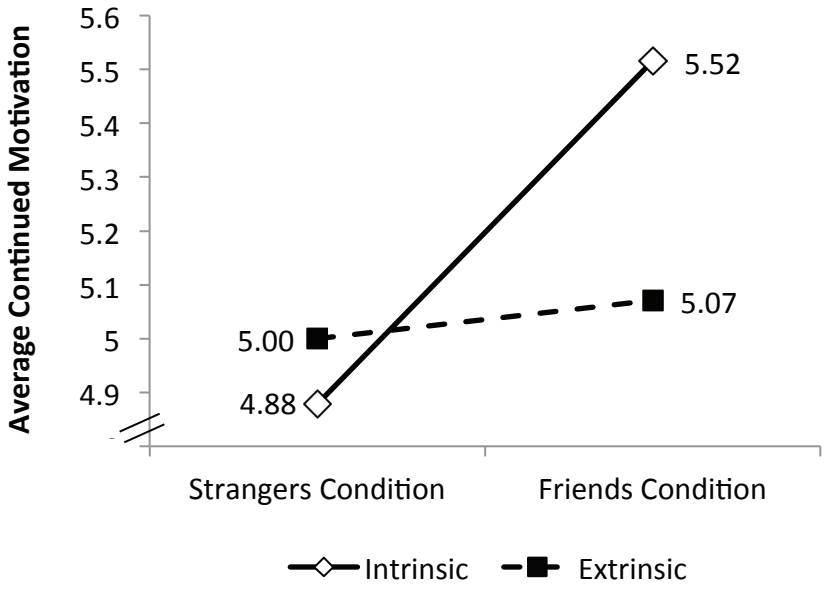

Figure 4.2. Effect of condition and orientation on continued motivation.

Specifically, intrinsically motivated individuals were more motivated to continue in the friends condition (M = 5.52) than in the strangers condition (M = 4.88). Extrinsically motivated individuals were relatively less motivated across both the strangers (M = 5.00) and friends conditions (M = 5.07). Thus, the highest motivation occurred for the intrinsic group in the friends condition.

Discussion

This study provides evidence that, contrary to popular belief, comparing one's progress to social others may be more motivationally beneficial for intrinsically motivated individuals. Even though extrinsically motivated individuals should be more motivated to get feedback from others, it is instead the intrinsically motivated individuals who seem to be more motivated to persist in their goals in a social goal context with friends. This finding is consistent with our prediction that extrinsically motivated people experience lower motivation when social comparisons are involved. Intrinsically

motivated people are able to remain focused, but only when they expect social comparisons to occur (in the friends condition). The strangers condition, on the other hand, creates an overjustification effect whereby they also become relatively less motivated.

In addition to the moderating role of motivational orientation, as theorized, an increased focus on others may also eventually lessen motivation over time, particularly for extrinsically motivated individuals. These participants may be the most likely to lose motivation to track their goals due to social comparison. Because intrinsically motivated individuals are more self-determined, and thus feel higher levels of self-efficacy and confidence, confidence is predicted to mediate the relationship between motivational orientation and continued motivation. This prediction was tested in the next study.

Study 4:

The Impact of Orientation on Continued Motivation

The goal of study 4 was to extend the findings of the prior experiments by examining why motivation might decrease more over time for extrinsically motivated individuals. The previous study found that individuals with an extrinsic orientation were relatively less motivated to continue pursuing their goals across both conditions. We predicted that the relationship between orientation and motivation is mediated by confidence, since self-directed individuals tend to demonstrate more self-efficacy and competence in their ability to continue to pursue a goal (Zuckerman et al. 1978). In order to test this prediction, study 4 uses a one-week time delay to examine confidence and motivation over time.

Method

Two hundred adult participants located in the United States were drawn from MTurk and randomly assigned to one of two conditions, a friends or a strangers goal condition, in the first wave of a 2-part study. These same participants were contacted one week later with an invitation to complete the second wave of the study. The response rate for the second wave was 73%, representing a sample size of n = 146 (33% female with an average age of 33). The one week delay allowed for a more stringent test of the effects of motivational orientation on the mediating and outcome variables by allowing some actual time to pass between measures.

Participants were first asked to select a goal in both conditions, similar to the previous studies. They were next asked to rate how confident they are in their ability to achieve this goal, and how sure they are that they can work on this goal daily on a 7-point scale where 1 = "strongly disagree" and 7 = "strongly agree." These two measures were combined into a single confidence index (α = .89). Participants were also asked how motivated they would be to log into a website daily and track progress toward this goal on a scale of 1 to 7 where 1 = "very unmotivated" and 7 = "very motivated." In the second wave of the study, participants were asked if they remembered which goal they chose and again responded to these same confidence and motivation measures.

This study used a different set of questions to assess intrinsic versus extrinsic motivation more situationally than the last study, since motivational orientation can be thought of as both a trait and something that can at times be situationally malleable (e.g., Harter and Jackson 1992). Examining orientation in both ways provides convergent validity of its role in goal progress. Respondents were asked to indicate to what extent

they agreed with certain reasons why they were motivated to work on this particular goal on a scale from 1 to 7 where 1 = "strongly disagree" and 7 = "strongly agree." These measures were from the Intrinsic Motivation - To Accomplish (IM) subscale (α = .88) and the Extrinsic Motivation - External Regulation (EM) subscale (α = .79) from the Leisure Motivation Scale (LMS-28) (Pelletier, Vallerand, Brière, and Blais 1989; See Appendix G). Median split scores were again used to create a measure of primary motivational orientation for each participant of (high) intrinsic (23% of participants; Mdn = 5.25), (high) extrinsic (18% of participants; Mdn = 3.00), or neither (60% of participants).

Results

Most participants (73%) accurately remembered which goal they chose in the first part of the study (n = 106). Those who did not remember their goal were excluded from the analysis, since we are interested in motivation to continue to pursue the chosen goal. A repeated-measures ANOVA with the two motivation measures at week one and week two as the within-subjects factor indicated a significant interaction between condition (friends vs. strangers) and orientation (intrinsic vs. extrinsic) on within-subjects motivation ($F(2, 101) = 3.46$, $p < .05$). There was also a main effect of orientation (intrinsic vs. extrinsic) on motivation ($F(2, 101) = 13.15$, $p < .001$). Specifically, intrinsically oriented individuals were more motivated ($M = 5.55$, $SD = .96$) than extrinsically oriented individuals ($M = 4.28$, $SD = .96$) to continue to make progress toward their chosen goals after a week had passed.

A mediation analysis (Preacher and Hayes 2004) demonstrated that confidence significantly mediated the relationship between orientation and continued motivation.

The total effect of intrinsic/extrinsic orientation on motivation was significant (β = -.68, p < .05). Additionally, orientation significantly impacted confidence (β = -.76, p < .01), which in turn impacted motivation (β = .47, p < .01). Finally, the main effect of orientation on motivation was no longer significant when controlling for confidence (β = -.32, p = .35); see figure 4.3. The bootstrap results based on 5,000 re-samples indicated that the 95% confidence interval for the indirect effect did not include zero [-.7700, -.0611].

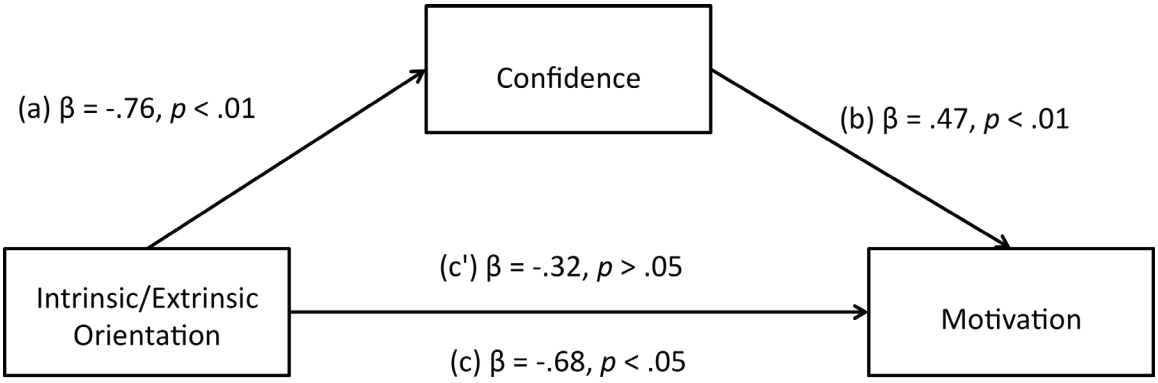

Figure 4.3. Confidence mediation model.

Discussion

This study provides evidence that confidence mediates the relationship between motivational orientation and continued motivation in pursuing goals over time. This is consistent with the notion that people who are intrinsically motivated often experience self-determined choice, while extrinsically motivated individuals tend to be more focused on social comparison, which can lessen confidence, particularly in competitive situations (Reeve and Deci 1996).

In addition to losing motivation over time, certain individuals may also become dishonest about their goal progress in order to bolster their confidence. In particular, we predict that when people experience decreased motivation overall, they will also tend to be more dishonest about reporting their progress. Increased dishonesty can therefore be employed strategically by individuals in order to boost confidence and counteract decreased motivation. This prediction was tested in the next study.

Study 5:

Does Decreased Motivation Also Lead to Increased Dishonesty?

The objective of study 5 was to examine whether people who are experiencing decreased motivation would also be more likely to be dishonest about reporting their progress. People who are lower in motivation are predicted to feel the need to temporarily self-enhance through dishonesty, in order to boost their confidence.

Method

Two hundred adult participants (36% female with an average age of 34) from the United States were recruited from MTurk. Participants were randomly assigned to one of two conditions, a friends or a strangers goal condition. The design of the study was similar to the previous studies, except that the chosen goal was converted to a daily goal (working on the goal for 15 minutes a day), and this study used a different dependent measure to assess how likely participants would be to record their progress on the website even if they hadn't quite achieved their daily goal.

Research on dishonesty has found that people tend to be more dishonest as long as they can justify it (Shalvi et al. 2011). Therefore, the measure was worded in such a way to allow a reasonable level of justification for all participants. Participants were asked,

"You didn't quite meet your recommended daily goal today, but you plan to make up for it tomorrow. How likely would you be to check a box indicating that you met your daily goal even though you didn't?" This likelihood of dishonesty was reported on a sale of 1 to 7 where 1 = "very unlikely" and 7 = "very likely." Median split scores were again used to create a measure of primary motivational orientation for each participant of (high) intrinsic (31% of participants; Mdn = 5.25), (high) extrinsic (27% of participants; Mdn = 3.75), or neither (42% of participants) using the same eight-question subset from the Work Preference Inventory as in Study 3 (Amabile, Hill, Hennessey, and Tighe 1994; See Appendix F).

Results

A two-way ANOVA with condition (friends vs. strangers) and the primary motivational orientation measure (intrinsic or extrinsic) revealed there was a significant interactive effect on dishonesty ($F(2, 194) = 2.98$, $p = .05$). When the neither group was excluded from the analysis, this interaction was stronger ($F(1, 112) = 6.29$, $p < .05$). Neither of the main effects were significant (condition $p = .66$; motivational orientation $p = .31$). A post-hoc test indicated that the marginal means were significantly different between conditions for both groups (See figure 4.4).

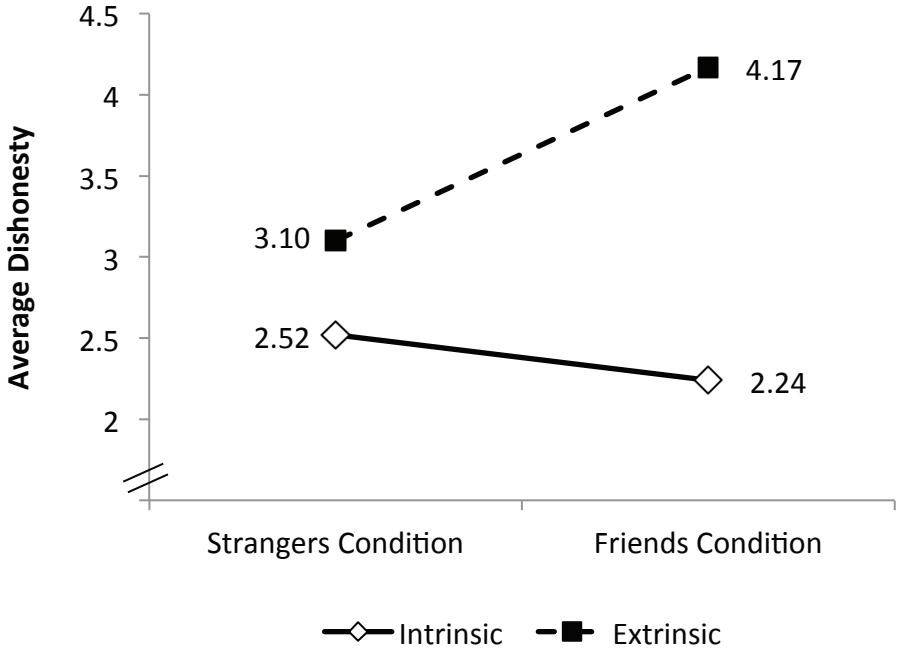

Figure 4.4. Effect of condition and orientation on dishonesty.

Specifically, intrinsically motivated individuals reported that they would be more likely to be dishonest in the strangers condition (M = 2.52) than the friends condition (M = 2.24), whereas extrinsically motivated individuals were more likely to be dishonest in the friends condition (M = 3.10) than in the strangers condition (M = 4.17). This finding is consistent with our prediction that people who are lower in motivation are more likely to engage in dishonesty. Specifically, this study found that extrinsically motivated individuals were more likely to be dishonest than intrinsically motivated individuals, but particularly when they were pursuing goals in a social context with friends.

Discussion

This pattern of results, combined with the results from the last study, indicates that people tend to be use dishonesty strategically to bolster their confidence when they are lower in motivation. Intrinsically motivated individuals tend to be lower in motivation

and more dishonest in the strangers condition, whereas extrinsically motivated individuals tend to be lower in motivation in both conditions and more dishonest in the friends condition.

General Discussion

These studies help demonstrate that self-directed individuals may be more likely to benefit from a socially-driven goal context with friends than extrinsically-motivated people because they can overcome the decreased confidence that can often accompany social comparison. Therefore our intuition of how helpful certain goal pursuit tools are for "most people" is subject to individual motivational orientation, and social goal pursuit tools may not be as widely helpful for the average consumer as they are often portrayed to be. As such, a one-size-fits-all approach to motivating people to work on their goals is not as widely helpful for consumers as the conventional wisdom would suggest.

Theoretical Contributions

This research helps provide a more nuanced view as to whether and when individuals may be more likely to benefit from social comparisons when engaging in goal pursuit behaviors. These studies use self-set goals and incorporate both individual variables and situational factors to examine how these can work together in promoting or prohibiting motivation. Prior research has demonstrated that social support can help facilitate initial motivation to pursue a goal (e.g., Fitzsimons and Bargh, 2003). These studies provide a complementary view by examining when the potential downsides of social goal pursuit are more likely to occur.

These studies also demonstrate a link between decreased motivation over time and increased propensity for dishonesty in recording one's goal progress. While previous

research has examined dishonesty in other contexts (e.g., Gino, Ayal, and Ariely 2009, Mazar, Amir, and Ariely 2008, Shalvi et al. 2011), the novel findings of these studies have demonstrated the relationship between goal pursuit and dishonesty, as moderated by motivational orientation. If individuals can easily lie to themselves about their goal progress, then such behavior can easily derail their plans to actually pursue the goal.

Implications

With the proliferation of smartphone apps, websites, and wearable fitness trackers dedicated to helping individuals achieve their goals and form habits, the prevailing assumption has been that people should pursue goals together rather than alone. Instead, technology aids should provide a more personalized approach for each consumer, depending on their situation and personal preferences. Consumers need better and simpler guidance as to when it is better to use a basic to-do list versus posting goal progress for others to see and comment on. Having access to a support network can be beneficial, as long as it doesn't result in social comparisons which decrease motivation to pursue a goal.

Programs that are offered both online and offline, such as Weight Watchers, also tend to advocate pursuing goals in a group setting. Instead of emphasizing social comparison through group weigh-ins, these companies could instead focus on matching people with their preferred style of working toward a goal. Companies could help participants self-select into a goal pursuit method that would benefit them most. For example, a short motivational orientation quiz at the beginning of a program could match individuals with the format (self-directed or social) that will work better for them. This initial preference could be updated later on if participants' needs and preferences change.

Self-reported data is problematic and may not always be helpful for goal pursuit, particularly when individuals are tricking themselves by recording progress that isn't entirely accurate. While wearable fitness trackers are meant to record progress automatically, they are also not immune to dishonesty. Someone wishing to reach his daily goal of 5,000 steps can simply shake the device repeatedly to simulate activity, for example. Future technology in these areas should focus on tools that help increase accountability and honesty, which will be helpful for participants tracking a more accurate and reliable account of their progress.

The findings from these studies apply to other situations where individuals are able to compare their own progress to that of others. In an education environment, for instance, students are often informed of their performance on tests and homework relative to all other students, or at the very least, the average performance of the class as a whole. This research shows that some students may benefit from this type of social comparison, while others may not. In online learning environments, in particular, students could be given the control to either see or not see how well their peers are performing when they log in to view feedback.

Directions for Future Research

Goal pursuit can be complicated or facilitated by a number of factors. Future research could examine the different types of social comparisons that can occur in these settings. For instance, is it better to compare yourself with someone who has similar goals overall or someone who has a few similar goals and some that are different? Is it more helpful to compare yourself with someone who has more goals, fewer goals, or the same number of goals? In addition, the number of social others that someone is working on a

goal with could impact motivation. It may be the case that having a larger social network can facilitate initial goal pursuit behaviors, but this larger network may also hinder motivation even more than a smaller network over time.

The effectiveness of the type and amount of feedback that people receive in these social goal contexts is also important to learn more about, and may depend on whether or not individuals are pursuing similar or different goals. Is it more effective to give feedback to others or to receive feedback and when the goals are similar or different? Visualizing a goal may be easier when an individual is focused on his/her own progress, for example, and this may be more straightforward when the goal differs from similar social others.

Motivation to work on one's goals is also an unfolding process over time. While the first study includes secondary data observations over several weeks and Study 4 provided an experimental test of what can happen over a period of one week, future research could examine social goal contexts over several months or even years. Also of interest would be people's affective responses to their motivation and performance over time. For example, how do people react to both success and failure in a social versus individual goal context? Such findings would shed additional light into effort, coping, and persistence in goal pursuit.

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APPENDIX A

Purchase Likelihood (Essay 1, Experiments 1a and 1b)

Nikon COOLPIX S9200 16 MP CMOS Digital Camera with 18x Zoom NIKKOR ED Glass Lens and Full HD 1080p Video (Black)

by Nikon

(396 customer reviews)

List Price: ~~$299.95~~

Price: $123.45

You Save: $176.50 (59%)

Special Offers Available

In Stock.

How likely would you be to purchase the camera?

Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely
○	○	○	○	○	○	○

Nikon COOLPIX L820 16 MP CMOS Digital Camera with 30x Zoom Lens and Full HD 1080p Video (Black)

by Nikon

(260 customer reviews) | 150 answered questions

In Stock.

Color: Black

- Powerful 30x zoom that lets you shoot amazing close-ups
- 16 MP CMOS sensor for exceptional image quality and enhanced low-light performance
- Record videos in Full 1080p HD with stereo sound
- Larger ergonomic design for easier handling and comfort

How much would you be willing to pay for this camera?

$ _____

APPENDIX B

Purchase Likelihood with Different Labels: Shopping Cart Condition

(Essay 1, Experiment 2)

Now, please reconsider the Blu-ray player that you thought about in the first part of the survey.

Sony BDP-S5100 3D Blu-ray Disc Player with Wi-Fi
by Sony
(396 customer reviews) | 182 answered questions
List Price: $139.99
Price: $89.00
In Stock.

Imagine that you ultimately decided to put this Blu-ray player in your Shopping Cart. Now imagine that several weeks have passed and you are considering whether to purchase the Blu-ray player.

How likely would you be to purchase the Blu-ray player after it had been in your Shopping Cart for a while?

Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely
○	○	○	○	○	○	○

Next >>

APPENDIX C

Desirability and Feasibility Ratings (Essay 1, Experiment 3)

iRobot 560 Roomba Vacuuming Robot, Black and Silver
by iRobot
(772 customer reviews) | Like (136)
List Price: $449.99
Price: $349.99 Prime
You Save: $100.00 (22%)
In Stock.

There are lots of reasons to put something on a Wish List. In making the decision to put this product on your Wish List, how important were each of the following?

	Not at all Important	Very Unimportant	Somewhat Unimportant	Neither Important nor Unimportant	Somewhat Important	Very Important	Extremely Important
Excitement and Interest	○	○	○	○	○	○	○
Product Design	○	○	○	○	○	○	○
Product Features	○	○	○	○	○	○	○
Budget	○	○	○	○	○	○	○
Price	○	○	○	○	○	○	○
Reliability	○	○	○	○	○	○	○

Note: Excitement and interest, product design, and product features are desirability attributes, while budget, price, and reliability are feasibility attributes (Liberman and Trope 1998; Liu 2008; Thomas, Chandran, and Trope 2007; Todorov, Goren, and Trope 2007).

APPENDIX D

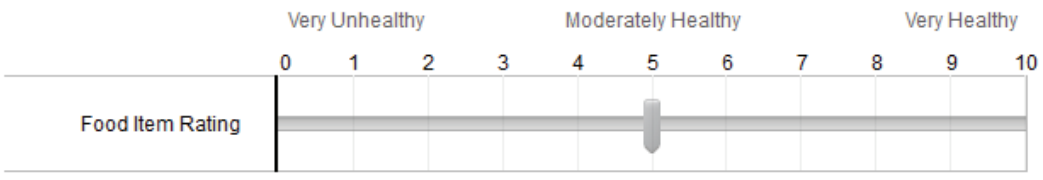
Example Stimuli (Essay 2, Experiment 1)

<table>
<tr>
<td>Estimation Condition

You are walking into a Starbucks coffee shop and are thinking about ordering a Grande (16 oz.) Iced Vanilla Latte.

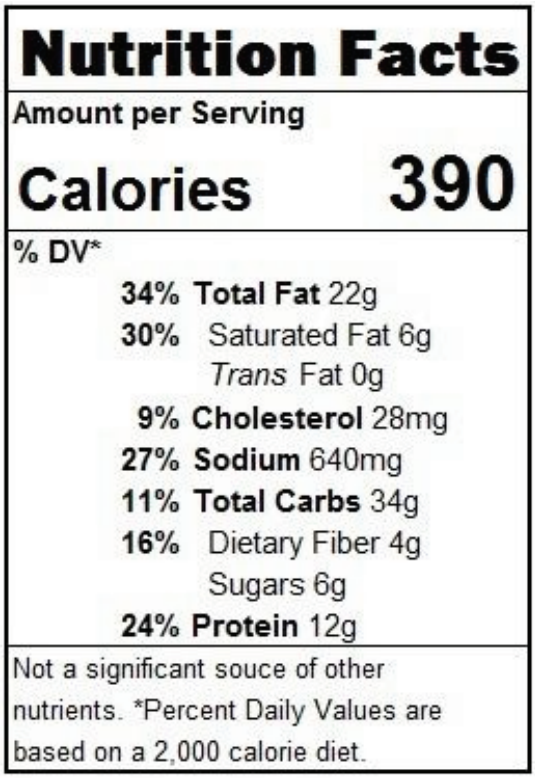
Ingredients: Espresso and 2% milk, flavored with vanilla syrup and poured over ice.

Approximately how many calories do you think this Grande (16 oz.) Iced Vanilla Latte at Starbucks contains?_____</td>
<td rowspan="2">No Estimation Condition

GRANDE (16 oz.) ICED VANILLA LATTE
Ingredients: Espresso and 2% milk, flavored with vanilla syrup and poured over ice.
<u>250 calories</u>
  </td>
</tr>
<tr>
<td>GRANDE (16 oz.) ICED VANILLA LATTE
Ingredients: Espresso and 2% milk, flavored with vanilla syrup and poured over ice.
<u>250 calories</u>
  </td>
</tr>
<tr>
<td colspan="2">How healthy do you think this food item is?
(Please use the slider on the scale below to indicate the extent to which you feel this item is unhealthy/healthy.)
 
</td>
</tr>
</table>

APPENDIX E

Example Stimuli from Nutrition Label Study (Essay 2)



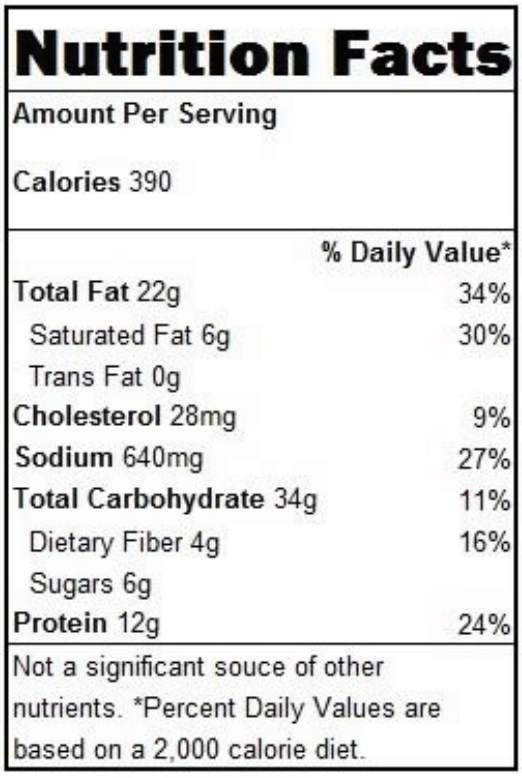
Nutrition Facts

Amount per Serving

Calories 390

% DV*	
34%	**Total Fat** 22g
30%	Saturated Fat 6g
	Trans Fat 0g
9%	**Cholesterol** 28mg
27%	**Sodium** 640mg
11%	**Total Carbs** 34g
16%	Dietary Fiber 4g
	Sugars 6g
24%	**Protein** 12g

Not a significant souce of other nutrients. *Percent Daily Values are based on a 2,000 calorie diet.



Nutrition Facts

Amount Per Serving

Calories 390

	% Daily Value*
Total Fat 22g	34%
Saturated Fat 6g	30%
Trans Fat 0g	
Cholesterol 28mg	9%
Sodium 640mg	27%
Total Carbohydrate 34g	11%
Dietary Fiber 4g	16%
Sugars 6g	
Protein 12g	24%

Not a significant souce of other nutrients. *Percent Daily Values are based on a 2,000 calorie diet.

Note: Example of the “new” label vs. “current” label conditions.

APPENDIX F

Trait Motivational Orientation Measures (Essay 3, Studies 3 and 5)

1. I enjoy relatively simple, straightforward tasks. (IM - Reverse Coded)

2. I am strongly motivated by the recognition I can earn from other people. (EM)

3. I'm more comfortable when I can set my own goals. (IM)

4. To me, success means doing better than other people. (EM)

5. I prefer to figure things out for myself. (IM)

6. I believe that there is no point in doing a good job if nobody else knows about it. (EM)

7. Curiosity is the driving force behind much of what I do. (IM)

8. I prefer having someone set clear goals for me in my work. (EM)

Note: IM = Intrinsic Motivation Scale; EM = Extrinsic Motivation Scale. All items are from the Work Preference Inventory (Amabile, Hill, Hennessey, and Tighe 1994).

APPENDIX G

Situational Motivational Orientation Measures (Essay 3, Study 4)

I am working on this goal…

1. To avoid doing other tasks. (EM)

2. For the satisfaction I feel when I try to overcome interesting challenges. (IM)

3. Because I don't like to appear to others as someone who does nothing. (EM)

4. For the pleasure I feel when I outdo myself in interesting activities. (IM)

5. Because sometimes it allows me to be appreciated by others. (EM)

6. For the pleasure of surpassing myself while doing activities that are challenging for me. (IM)

7. To show others that I am a dynamic person. (EM)

8. For the satisfaction I get while trying to master complex activities. (IM)

Note: IM = Intrinsic Motivation - To Accomplish Subcale; EM = Extrinsic Motivation - External Regulation Subcale. All items are from the Leisure Motivation Scale (LMS-28) (Pelletier, Vallerand, Brière, and Blais 1989).