CONSEQUENCES AND CAUSES OF USE OF BROAD OR NARROW CATEGORIES
IN BUDGETING AND PLANNING

by

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Individuals have to plan for the use of their resources (e.g., time, money, etc.) daily. Factors that affect how individuals plan and the accuracy of their plans have been topics of interests for researchers. Recent research suggests that one such factor is how much one plans. Interestingly, evidence suggests that the more one plans, the less accurate one’s predictions of one’s use of resources are. Much of this research has focused on demonstrating this tendency when one plans for and uses one’s time. I explore this tendency in the financial domain by studying the relations between how detailed one’s budget is, and how well one’s budget predicts one’s expenses. In the first half of the dissertation, using category size as one measure of how detailed one’s budget is, I find evidence that the more detailed one’s budgets are, the less accurately they predict one’s spending. In the second half of my dissertation, broadening my research to both the temporal and financial domains, I take on two major related questions. First, what determines the level of categorization consumers endogenously choose? Second, are consumers motivated to see things in a way that tells them that they have more spare resources for things they like? I find that consumers’ liking for products or activities affects the level of categorization consumers endogenously choose. Consumers tend to delude themselves that they have more spare time for activities that they like strongly. But people with low propensity to plan indulge in this delusion more than people with high propensity to plan.
To my parents, Hoa and Hanh, for their unending love and support.

To my advisor, John, for his incredible dedication and support for my career.
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Chapter 1. Background

1.1 Introduction

Suppose you are remodeling your new house and want the project to fit within a preset budget. To achieve this goal, you might break your total budget into sub-components, such as one for furniture, one for lighting, one for carpeting, and one for decorations. You could, in concept, break the budget into even finer categories – furniture for the bedroom, furniture for the living room, etc. This dissertation considers how individuals’ budget planning and spending of their resources are affected by the breadth of budgeting categories and by differential liking of the products or activities in these budgeting processes.

There are five main sections in this dissertation. In the first section, I briefly review the literature used to derive the hypotheses tested in five experiments. I then examine the effects of the breadth of product categories on individuals’ budget planning and spending of resources (Studies 1 and 1a). I explore how the breadth of budgeting categories affects planners’ confidence, and consequently, their decisiveness when considering whether to spend additional resources (Study 2). I explore two factors that affect individuals’ endogenous choice of a level of categorization, specifically, individuals’ propensity to plan and liking for the option demanding resources (Study 3). I argue that individuals’ liking for products or activities drive them to assign products or activities into broader levels of categorization to reduce a sense of resource constraint, or in other words, to change their perception of spare resources available for these strongly liked products or activities. I directly test the effect of liking on perception of spare resources in Study 4 manipulating degree of liking. In study 4, I explore whether individuals feel they have more spare resources for activities they strongly like than activities they like less and
whether this tendency is magnified for activities in the more distant future, making Zauberman and Lynch’s (2005) “Yes…Damn” effect more pronounced for better liked activities.
1.2 The Effects of Categorization Level on Willingness to Spend in Budgeting and Shopping

Considerable research has shown that individuals maintain mental budgets for different categories of spending (e.g., Thaler 1985, Thaler 1993, Thaler 1999). Consumers’ spending and consumption behaviors are affected by how mental accounts are formed and how expenses are assigned into them. The more spending is recorded in one account, the less likely consumers will spend from that account (Soman and Lam 2002). Consumers are also motivated to post ambiguous expenses (e.g., a dinner with friends at a restaurant with live music) into the accounts that they perceive to have more funds available (Cheema and Soman 2006). Assigning a resource to an account associated with “specialness” makes consumers less likely to use it because they keep waiting for the perfect occasion to use it, which often comes after resources such as wine or coupons have expired (Shu 2011). More generally, mental budgets have been implicated in under-consumption in some categories and over-consumption in others (Heath and Soll 1996).

Broader product categories may cause one to be less likely to carefully consider opportunity costs. Spiller (2011) shows that the narrower the category of products that one is considering purchasing, the more they impose a sense of resource constraint. This sense of resource constraint prompts one to consider opportunity costs more. Consequently, one tends to be less willing to spend one’s resources on narrow categories of purchases than on broad categories of purchases.

For example, when considering spending your “furniture” budget on a beautiful, high-end sofa for your living room, it may not cross your mind that the beautiful sofa in the living room means you will not have enough money left for a decent dining table in the kitchen. Breaking the “furniture” budget into a “living room furniture” and a “kitchen furniture” budget will help you
consider opportunity costs in each sub-category more, and thus spend money more efficiently. For example, within the “kitchen furniture” budget, considering which dishwasher to buy will help you remember more easily that you need to leave some money for the dining table in the kitchen, than when considering which sofa to buy for the living room. In summary, the work of Spiller (2011) suggests that one will be less willing to spend one’s resources when considering spending those resources on narrow categories of products than on broad categories of products because the former are more likely to prompt opportunity cost consideration.

Other lines of research suggest a different factor that drives willingness to spend: Malkoc and Zauberman (2006) show that willingness to pay increases with concreteness of representations of outcomes. Concreteness is affected by both category size and psychological distance. Narrower categories should evoke more concrete representations than do broad categories. Additionally, the level of concreteness may also differ between when one budgets and when one shops. According to construal level theory (CLT, e.g., Trope and Liberman 2010), temporal distance is one determinant of the level of concreteness of representations. Budgeting or planning is more temporally distant from the act of spending than shopping is. Thus, budgeting should evoke less concreteness in representations than budgeting does.

I expect that liking for products, or affect, is another factor that has the same effects on amounts of money budgeted and shopped as the effects of concreteness discussed above. Narrow categories are more likely to recruit specific exemplars of that category to one’s mind than do broad categories (i.e., the fan effect, Anderson and Redder 1999). And specific exemplars (i.e., identifiable victim) drive people to donate more money than does the large category of those exemplars (i.e., statistical victims) because they evoke more affectively charged responses (e.g., Small, Lowenstein and Slovic, 2007). Similarly, narrow categories should also make people
more willing to spend on positively valued products than do broad categories because they evoke more affective responses. The level of affect evoked should also be affected by whether one is budgeting or shopping because of differential temporal distances from the act of spending on specific products. Budgeting is more temporally distant from the act of spending than shopping is. Thus, budgeting should evoke less affect intensity than shopping does, according to CLT (e.g., Trope and Liberman 2010).

In this dissertation, I would like to explore how these complex conflicting forces combine to affect one’s budget and spending.

My research helps deepen a body of literature about the planning fallacy (Kahneman and Tversky 1979), and the irony of planning (Buehler and Griffin 2003, Spiller and Lynch 2010). There is a large literature on the “planning fallacy.” Most of this work shows that people plan to complete tasks sooner than they actually do, but a smaller set of papers shows that people plan to spend less than they do (Peetz and Buehler 2009, Peetz and Buehler 2012). Peetz and Buehler (2009) termed this tendency the “budget fallacy”, and described it as individuals’ tendency to “underestimate their future spending, predicting that they will spend less money in the upcoming week than they actually spend.” I will predict and show that this “budget fallacy” is exacerbated when consumers plan with narrower categories. Additionally, I explore category size as a new measure of the extent of planning. I consider budgeting for one broad category to be less extensive planning than budgeting for many specific, narrower sub-categories.

In summary, in this research I aim to examine how the size of budgeting categories affects consumers’ budget planning and spending, and what makes people assign products or activities to a narrow category instead of a broader one.
1.3 The Effects of Category Size on Planners’ Confidence

Budgets are partly spending forecasts and partly intended to limit (over)spending in a category to avoid running out of a resource. When an opportunity to use a resource arises, the consumer must predict whether this may exhaust “pare” resources and lead to opportunity costs. Confidence in these assessments is important because greater confidence in assessments of “pare” resource should increase willingness to use a resource with a perceived surplus and decrease willingness to use a resource with a perceived deficit. In other words, the slope of the relationship between estimated slack and willingness to spend should increase with greater confidence in slack assessments.

I expect that broader categories should lead to more confidence in “pare assessments. Broad, general budgets allow one to forecast using summary rates of occurrence/usage stored in memory (Menon 1993). In contrast, unpacking budgets into narrower, specific sub-budgets increase the likelihood that individuals will use a recall-and-count strategy when estimating frequency of occurrence. I expect that these two estimating strategies have differential consequences on consumers’ confidence in their estimates of pare resources. Differential confidence in judgment of pare resources affects the decisiveness with which one decides whether or not to spend resources on additional purchases or activities.

1.4 The Effects of Liking on Estimates of Pare Resources for Activities

In studies 3 and 4, I will examine how individuals liking for product or activities affect their level of categorization, and their estimates of pare resources available for those products or activities. When trying to find time for an appealing activity in the future, motivated reasoning may cause one to feel that one has a lot of pare time for it. Thus, one is willing to commit to the
activity, only to regret one’s commitment when that time comes. People have been shown to overestimate their free time and spare money in the future, leading to the “Yes-Damn” effect (Zauberman and Lynch 2005) and caused by “expense neglect” (Berman, Tran, Lynch and Zauberman, 2013). 1

Prior explanations for this effect were purely cognitive, but I propose a motivational cause. One’s liking for an activity may exacerbate this overestimation of spare resource for the future. Thus, people may exhibit the “Yes-Damn” effect more for activities or purchases that they strongly like than for activities or purchases that they like less. In this work I only focus on activities or purchases that one finds appealing. I expect that one’s estimate of the difficulty of completing some proposed activity decreases with how strongly one likes it, and more so for activities in the distant future than in the near future.

Figure 1 shows the proposed overall theoretical network in my dissertation. More elaborate discussions of the parts of this network will follow in the subsequent sections. Previous research on Construal Level Theory (CLT, e.g., Trope and Liberman 2010) suggests a positive relation between concreteness and perceived constraint. Thus, this link is included in Figures 1 and 1a. However, because this relationship has been demonstrated extensively in CLT literature, it will not be measured and shown again in this dissertation.

1 In the “Yes…Damn” effect, people say yes to activities in the future that they would say no to if they were asked to do the same thing in the very near future. People falsely expect to have more spare time in a few weeks than they have today. But when the time comes to make good on the activity scheduled weeks ago, they discover they are just as busy as they were on the day when they first took on the commitment, causing them to curse themselves. In “expense neglect”, people expect to have more spare money in the more distant future because they expect their incomes to grow but do not expect the extent of coincident expense growth, and because they do not give sufficient weight to perceived expense growth relative to perceived income growth.
Figure 1. Proposed Overall Theoretical Network in Dissertation

For the sake of simplicity, figure 1 can be broken down into two figures: 1a - Consequences of Category Size for Budget and Spending and 1b - Causes of Size of Spontaneously Chosen Categories.
Figure 1a. Consequences of Category Size for Budget and Spending

Task: budgeting (0) vs. spending (1)

- temporal distance
- concreteness and liking

- Study 1, 1a
- CLT literature

+ $ Budgeted
- $ Spent

- perceived constraint
- planning fallacy

- Study 1, 1a
- 1a

+ confidence

+ decisiveness of spending decision

Figure 1b. Causes of Size of Spontaneously Chosen Categories

liking
- Study 3
- Study 4

propensity to plan
- Study 3

resource slack
- Study 3

category size
In the next section of this dissertation, I explore the effects of category size on processes in planning. Specifically, I study the effects of category size on the planning fallacy, and on planners’ confidence. In the second part of the dissertation, I explore some factors that make people assign an expense, temporal or financial, into one level of categorization instead of another.
Chapter 2. Individuals Exhibit the Planning Fallacy for Money More as the Product Category Gets Narrower

2.1 Conceptual Background

2.1.1 The Planning Fallacy

Individuals tend “to underestimate the time required to complete a project, even when they have considerable experience of past failures to live up to planned schedules.” This planning fallacy (Kahneman and Tversky 1979) has been pervasive in diary studies (e.g., Buehler, Griffin, and Ross 1994, Spiller and Lynch – working paper), laboratory activities (e.g., Hayes-Roth 1981; Hayes-Roth & Hayes-Roth 1979) and large commercial projects (e.g., Buehler et al. 1994, Kidd 1970). Although discussions of the planning fallacy in organizations often refer to underestimation of required resources in general, including both time and money, much empirical evidence has focused on demonstrating individuals’ planning fallacy for time. There is less empirical evidence on the planning fallacy for money (cf. Buehler, Griffin and Peetz 2010, Peetz & Buehler 2009; Ülkumen, Thomas, and Morwitz 2008). In research that focuses on the planning fallacy (for both time and money), the planning fallacy has been measured as the difference between expected spending and actual spending. For time, planning fallacy has been measured as the difference between expected temporal distance to completion, and actual distance to completion. For money, the planning fallacy has been measured similarly as the difference between expected dollars to be spent and actual dollars spent.

Examples of the planning fallacy abound. The Sydney Opera House took ten years longer and cost 15 times more money than was originally estimated (Buehler, Griffin, and Ross 1994). Denver International Airport opened 16 months later than planned and $2 billion over budget (Buehler, Griffin, and Peetz 2010). The Scottish Parliament building in Edinburgh, cost 10 times
more than estimated (Rt Hon, the Lord Fraser of Carmyllie 2004). The average cost to remodel a kitchen in an American home (i.e., $38,769) is more than twice the average estimate of homeowners (i.e., $18,658) (Remodeling 2002).

Despite the plentiful data on the magnitude of the planning fallacy in the industrial world, the cleanest evidence of this fallacy comes from the laboratory studies of personal projects. This is because there are many political and financial motives for project leaders to underestimate the time and costs needed to complete industrial and public projects to persuade others to take an action that benefits the underestimating planner (Buehler et al. 2010). The literature shows that the planning fallacy for time reflects underestimation of time to completion, not the underestimation of time on task. Explicit deadlines have been shown to have strong effects in reducing task completion times, even when individuals do not like these deadlines (Tversky and Shafir 1992).

Interestingly, individuals tend to be very confident of the accuracy of their overly optimistic estimates (Buehler et al. 1994, Buehler et al. 1995). In Buehler et al.’s research, participants rated how certain they were that they would complete tasks by their predicted time on average from 70 to 84 on a scale of 100, while in fact only 40% of them completed by the time predicted.

Causes of the planning fallacy. Researchers have proposed that accurate completion predictions require comparing the tasks being planned with similar past experiences (Buehler, Griffin, and Ross 1994) or with similar projects from other individuals (Kahneman and Tversky 1979). In other words, it requires changing perspective to adopt an “outside view” by considering the distribution of performance of other similar projects or by considering the external factors.
that might interfere with goal completion. However, when planning and predicting, individuals tend to adopt an “inside view” by envisioning how they will execute the tasks without sufficiently taking external factors into account. This is firstly because the inherent forward-looking nature of planning and predicting prevents individuals to look back on the past. Secondly, even if individuals consider their past experiences when planning, they tend to ignore base-rates of their completion times. And thirdly, individuals tend to attribute factors that interfered with goal completion in the past to specific, transient situational factors that are perceived to be relevant only in the specific situations in the past and not in the future.

Although considerable research has demonstrated the planning fallacy for time, not much work has focused on the planning fallacy for money. I contribute to this body of literature by focusing on the planning fallacy for money.

Buehler and Griffin (2003) and Spiller and Lynch (2010, working paper) show an ironic effect of planning in that individuals who plan more exhibit the planning fallacy more. In my research, I explore the size of product category as a new measure of the extent of planning that is highly relevant to the domain of budgeting and a “budget fallacy.” Budgeting for one general, broad product category (e.g., food) should be less extensive planning than budgeting for many more specific, narrower sub-categories of that broad category (e.g., meat, vegetables, etc.). Thus, in this work I aim to extend Spiller and Lynch, and Buehler and Griffin’s findings to planning for money. I hypothesize that individuals exhibit the planning fallacy for money more as their plan (or budget) gets more specific. The specificity of their budget is operationalized as the size of product categories that they are planning to spend on.
H1: Individuals exhibit the planning fallacy for money more as they budget for narrower product categories.

This hypothesis is also consistent with recent findings that individuals commit the planning fallacy (for time) less if they are induced into an abstract mindset (Peetz and Buehler 2012, Peetz, Buehler and Wilson 2010). This is because when individuals think abstractly, it is easier for them to see the similarity between the current plan and other plans in the past. Thus, it is easier for them to generalize task completion times from past experience.

The prediction in hypothesis 1 is fueled by several areas of research that I will discuss in the next sections.
2.1.2 Narrower Categories Increase Perceived Constraint and Opportunity Cost Consideration

Imagine seeing a nice music CD in a Starbucks shop. You are considering buying the CD with a gift card you just received. Will you be more likely to buy the CD if the gift card is a Visa gift card or a Starbucks gift card?

Spiller (2011) shows that broad currencies (e.g., Visa gift cards) do not prompt people to think of opportunity costs much as these currencies are associated with a lot of purchases. In contrast, narrower currencies (e.g., Starbucks gift cards) prompt people to think of opportunity costs more as these currencies are associated with fewer purchases. This is an implication of the fan effect: Constructs with many associations in memory activate each association less strongly than do constructs with fewer associations in memory (Anderson and Reder 1999). Consequently, in the example that opens this section, one will be more likely to buy the CD using a Visa gift card than using a Starbucks gift cards because the latter prompts one to consider opportunity costs more, and thus, makes one less willing to spend one’s resources.

Through a series of experiments, Spiller shows robust evidence that individuals become less willing to spend resources when they are thinking of spending on/from narrow categories (e.g., Starbucks gift cards) than when they are thinking of broad categories (e.g., Visa gift cards). Spiller also shows that this is because narrow categories evoke a sense of resource constraint, which makes one consider opportunity costs more.

2.1.3 The Effects of Concreteness on Willingness to Spend

The effect of category size on the sense of resource constraint, however, is not the only driver of willingness to spend. A likely second driver of willingness to spend is the concreteness
of representations of outcomes. Concreteness can arise from the narrowness, or specificity, of
categories, as well as from temporal distance from the act of spending. Budgeting or planning is
more temporally distant from the act of spending than shopping is.

A considerable body of literature has explored the effects of psychological distance,
including temporal distance, among others, on one’s cognition and behavior (CLT; for a detailed
review, see Trope and Liberman 2010). Temporal distance affects the level of concreteness, or
abstractness, with which one thinks about outcomes, as well as which type of features
(desirability or feasibility) of people, objects or events that one focuses on.

Building on research on construal level, another line of research that studies
intertemporal judgment and choice shows that the level of representation concreteness
(manipulated through temporal distance, among others) dramatically increases present-bias, or
intertemporal discount rates, that individuals exhibit (Malkoc and Zauberman 2006). A present-
biased consumer more hotly desires a goal that is close at hand compared to the same goal in the
distance, and will give up more in the future in order to have the goal now. Malkoc and
Zauberman show that individuals exhibit higher present-bias, or discount rates (measured by
changes in willingness to pay) when the outcome is temporally close (i.e, in decisions to defer
outcome) than when the outcome is temporally distant (i.e., in decisions to expedite outcome).
People are much more willing to pay when the outcome representation is concrete, than when the
outcome representation is less concrete. In these authors’ research, outcome concreteness is
manipulated through temporal distance, as well as visualization of the outcome.

Another way that concreteness can be manipulated is by breaking down an abstract,
general category into many more specific, narrow sub-components. This manipulation in my
dissertation produces a second source of concreteness, besides temporal distance, that affects willingness to pay. More narrow categories should evoke more concrete representations than broad, general categories. Thus, more specific, narrow categories should induce higher willingness to pay than broad categories because they evoke more concrete representations of the outcome.

Both the effects of perceived constraint and concreteness are present during budgeting and shopping. However, budgeting and shopping differ in temporal distance from the act of spending, and thus, they differ in the level of concreteness that they evoke in representations of outcome. Moreover, consistent with Malkoc and Zauberman’s (2006) notions of proximity effects on hyperbolic discounting, I implicitly assume that there is a nonlinear, positively accelerated relationship between degree of concreteness and desire, which affects willingness to pay for positively valued goods. Thus, the slope of a unit change in concreteness on desire is greater on the high than on the low end of some concreteness scale. This produces a stronger slope of the relationship of concreteness to spending than of concreteness to amount budgeted. As a result, the relative strengths of perceived constraint and of concreteness differ in budgeting and shopping. This change in relative strength of paths, I posit creates a planning fallacy for money.

Now consider that concreteness is also affected by the narrowness of categories. Narrower categories yield more concrete representations. The same nonlinear effect of concreteness on desire therefore will produce a larger change from budgeting to spending when beginning at the more concrete end of the scale, as when planning with finer categories. In contrast, the slope of perceived constraint on spending remains the same, and positive, as
category size gets narrower. Thus, the difference in the relative strengths of perceived constraint and concreteness increases as category size gets narrower.

I posit that a combination of the above forces, which accelerate at different rates as category size gets narrower, produces a budget fallacy that becomes larger as category size gets narrower.

The level of concreteness (or abstractness) of representations do not necessarily have to come from the present task to produce an effect on one’s decision. Malkoc, Zauberan and Bettman (2010) show that the level of concreteness of mindset activated in a task can have carry-over effects that affect one’s decisions in subsequent related or unrelated tasks.

2.1.4 The Effect of Liking on Willingness to Spend

I expect that willingness to spend is also driven by one’s liking, or affective responses to products. A large body of literature has demonstrated the detrimental effects of temptations, which are driven by affective reactions, on one’s plans. I expect that affective responses can lead one to deviate from one’s budgets (i.e., financial plans) when one actually spends money. I expect affective responses to have relatively similar effects on willingness to spend as concreteness. Similar to concreteness, affective responses should also be affected by temporal distance and by the specificity of category size.

Temporal distance from an object, along with other dimensions of psychological distance, reduces the intensity of affective responses to that object (e.g., Trope and Liberman 2010). Because budgeting is more temporally distant from the act of spending on specific products than shopping is, individuals should experience less intense affective responses to those products when budgeting than when shopping.
Additionally, affective responses to products are also affected by the size of product category. Narrow categories are more likely to recruit specific exemplars of that category to one’s mind than do broad categories (i.e., the fan effect, Anderson and Redder 1999). And specific exemplars (i.e., identifiable victim) drive people to donate more money than does the large category of those exemplars (i.e., statistical victims) because they evoke more affectively charged responses (e.g., Small, Lowenstein and Slovic, 2007). Similarly, narrow categories should also make people more willing to spend on positively valued products than do broad categories because they are more likely to prompt recruiting of specific exemplars to one’s mind, which evoke more affective responses.

Differences in opinions on the dissertation committee resulted in liking for products, or affect, being removed from the dissertation proposal, and the mediator concreteness being used as its replacement. However, I still found the liking hypothesis a credible one. Thus, I included the mediator liking in the theoretical models and studies for exploratory purposes.

Another line of research that also supports the hypothesis that narrow categories increase willingness to spend originates from Sussman and Alter (2012). These authors show that individuals tend to be more willing to spend on purchases that they consider “exceptional”. These are large purchases that are considered “special”, such as electronics, birthday gifts, etc. The authors hypothesize that consumers naturally classify exceptional expenses (e.g., birthday gifts, electronics) into very narrow categories, treating them as unique one-time occurrences. As a result, splurging on these purchases feels less detrimental to one’s finances in the long run. This leads to overspending on current exceptional expenses and underestimates of future exceptional expenses. As initial evidence supporting this underlying process, Sussman and Alter
(2012) show that when consumers are prompted to think of exceptional purchases as members of a larger class of goods, consumers’ willingness to spend on exceptional purchases is reduced.

Finally, placing products in finer categories may arguably reflect more detailed planning. Buehler and Griffin (2003) found that having participants explicitly form detailed plans led to a greater prediction bias for use of time.

In summary, I expect category size to have differential effects on individuals’ willingness to spend when individuals budget and shop. When individuals budget, narrow categories are more likely to reduce willingness to spend than broad categories, because the former is more likely to prompt a strong sense of resource constraint, which leads to more opportunity cost consideration. In contrast, when individuals shop, narrow categories are more likely to increase willingness to spend than broad categories, because the former increases the concreteness of representations of outcome and create intensified desire to have the product now.

I test hypothesis 1 in study 1. Since this study examines how individuals budget and spend their money, it is plausible that these behaviors are partly governed by relatively stable, long-lasting individual tendencies such as propensity to plan for money and how well individuals control their spending. Thus, these tendencies in participants will be measured using the Tightwad-Spendthrift scale (Rick, Cryder, Loewenstein, 2008), and an adapted version of the scales measuring Propensity to Plan for Money in the long run (i.e., next 1-2 weeks) (Lynch, Netemeyer, Spiller and Zammit, 2010).

Figure 2 shows the proposed theoretical network in studies 1 and 1a. The proposed mediators, concreteness and perceived constraint, are not tested in study 1, and are tested in study 1a. I exclude individual differences from the model to reduce visual complexity.
In study 1, I test the idea that smaller (i.e., narrower) categories produce a bigger difference in willingness to pay between the budgeting and the spending stages, producing a greater planning fallacy for narrower categories. In Study 1a, I attempt to replicate that finding and demonstrate how it is explained by two offsetting mediational paths. These paths have different potency in budgeting (temporally distant from buying) and actual spending, due to the lower temporal distance and greater concreteness associated with spending. For both budget and spending, broader categories reduce perceived constraint, and since more constraint reins in both budget and spending, the sign of this indirect path is positive. Offsetting this is that broader categories are less concrete, and more concrete categories produce more impatience to acquire positively valued goods, yielding a negative indirect path from category size to budget and spending. I argue that this negative indirect path is weaker for budget than for spending due to greater temporal distance, and this produces a situation where narrow categories make spending increase faster than budgets, yielding a planning fallacy.
2.2 Study 1: Simulated Shopping and Budgeting Experience

2.2.1 Method

Study 1 tests Hypothesis 1, that the planning fallacy for money will increase when people think in terms of narrower categories.

Study Overview:

350 MTurk subjects participated in an online study to be paid $1.40. Participants were randomly assigned to one of three conditions (Category Size: Broad vs. Narrow vs. Very Narrow). In this study, participants budgeted and shopped for a list of grocery products for enough consumption in one week. I expected that the difference between the amount of money that participants budgeted and the amount of money that participants spent would increase as Category Size changed from being broad, to being narrow, to being very narrow.

Procedure:

Participants went through three main tasks of budgeting and shopping. In task 1, participants budgeted to buy grocery products for enough consumption in 1 week. In task 2, participants shopped for the same products that they budgeted for in task 1, for enough consumption in that same week (week 1). In task 3, participants budgeted to buy a different set of grocery products for enough consumption in a second week (week 2).

All participants were first given a list of 40 grocery products, including 20 food and 20 beverage products (e.g., Nestle instant coffee, Safeway instant coffee, Welch’s grape juice, etc.).

*Manipulation of category size:*
In the condition of Broad category, participants sorted this list of 40 products into 2 categories with fixed labels, “Food” and “Beverages”. In the condition of Narrow category, they sorted the list of 40 products into 20 narrow categories with fixed labels, which are the sub-categories of the broad categories “Food” and “Beverages”, (e.g., Ground coffee, grape juice, herbal tea, etc.). The study was set up such that there were two brands in each narrow category. For example, in the narrow category “instant coffee”, there were two products “Nestle instant coffee” and “Safeway instant coffee.” In the condition of Very Narrow Category, participants were just asked to take several minutes to carefully read through the list of 40 products. Because the only way categories can be more narrow and specific than the level in the Narrow Category condition is at the brand level, each “very narrow category” was operationalized as a product with a brand (e.g., Welch’s grape juice). Thus, in the Very Narrow Category condition, it was not possible to ask participants to sort the 40 branded products into any categories other than the branded products themselves. A task in which participants sort a product into itself will likely not induce any additional effects, and will likely prompt participants to question the design of the study. So I replaced that task with simply asking participants to carefully read through the list of branded products. The condition of Very Narrow Category was originally included to test another hypothesis that required three levels of category size. That hypothesis was not supported so it will not be discussed in this dissertation.

All these categories follow a hierarchical structure such that the 40 very narrow categories can be categorized into the 20 narrow categories, which in turn can be categorized into the 2 broad categories. The whole study can be divided into two hypothetical weeks. Tasks 1 (budgeting) and 2 (shopping) are for enough grocery consumption in the first week, and task 3 (budgeting) is for enough grocery consumption for the second week. One set of products
including 5 foods and 5 beverages (covering 10 of the 20 narrow categories) was used for week 1 (i.e., tasks 1 and 2 used the same set of these 10 products). A different set of products, including 5 foods and 5 beverages (covering the other 10 of the 20 narrow categories), was used for week 2 (i.e., for task 3). A summary of the organization of the study is presented in table 1.

<table>
<thead>
<tr>
<th>Task</th>
<th>Budgeting</th>
<th>Week</th>
<th>First set of 10 products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>Budgeting</td>
<td>Week 1</td>
<td>First set of 10 products</td>
</tr>
<tr>
<td>Task 2</td>
<td>Shopping</td>
<td>Week 1</td>
<td>First set of 10 products</td>
</tr>
</tbody>
</table>

Participants were told that their grocery consumption was typically about $50 per week, but they could spend or budget however much that they wanted in each week.

Task 1 - Budgeting. Besides the sorting task at the beginning of the study, another part of the category size manipulation was also presented in task 1, where participants budgeted for their grocery consumption in the first week. Participants were presented with either the 2 broad categories, 20 narrow categories, or 40 very narrow categories, depending on their condition. They were then asked to budget for their consumption over one week by setting (i.e., typing in) a budget amount, in dollars, for each of the [2/20/40] categories presented to them.

Task 2 - Shopping. In task 2, i.e., shopping for the groceries that participants budgeted for, for enough consumption over the first week, all participants were presented with a list of 10 unbranded products (e.g., tomatoes, orange juice) as their shopping list, and were asked to shop for these 10 products for enough consumption in 1 week, using the budget they just created in task 1. These unbranded 10 products were similar to the products participants budgeted for in task 1. When shopping for each product, participants saw one expensive and one cheaper brand. Each brand had its price presented. Participants typed in two text boxes how much of each option
that they would buy. Participants entered amounts purchased in the form of pounds for foods and ounces for beverages. They could buy some amount of both options, only one of the two options, or not buy any option at all. The shopping list (i.e., the list of 10 unbranded products) was always present and visible to participants throughout the shopping task.

In task 2, i.e., shopping for groceries, another part of the category size manipulation was also presented. While shopping, participants saw feedback of how much they had spent in each category. Depending on the condition participants were in, participants saw how much money they had spent in either each of the 2 broad categories, each of the 10 narrow categories, or each of the 20 very narrow categories. Participants also saw a feedback of how much they had spent in total, but this feedback is present in all conditions and constant across conditions.

Task 3 - Budgeting. After participants shopped for all 10 products, they moved to task 3. In task 3 participants budgeted to buy groceries for enough consumption in another week (Week 2). The 10 products (or 10 narrow product categories) used in task 3 were different from the 10 products used in tasks 1 and 2. There were again 5 foods and 5 beverages. In task 3, depending on participants’ condition, they were presented with either 2 broad categories, 10 narrow categories, or 20 very narrow categories. Participants were asked to set a budget for each of the category presented to them. So task 3 was similar to task 1. The only difference between tasks 3 and 1 was the set of grocery products. Again, participants were told that their grocery consumption was typically $50 dollar per week, but that they could spend as much or as little money as they wanted. A planning fallacy in Week 1 is evidenced by the difference between Budgeted Spending and Actual Spending in Week 1 – i.e, Task 1 vs. Task 2. One can also ask the question of whether similar effects of category size will be observed after feedback in week 1 when one budgets again for week 2 in “Task 3”.

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After completing task 3, participants filled out the Tightwad-Spendthrift scale (Rick, Cryder, Loewenstein, 2008), adapted scales measuring Propensity to Plan for Money in the next 1-2 weeks (Lynch, Netemeyer, Spiller and Zammit, 2010), and demographics variables.

The dependent variable was the amount of money that participants budgeted or spent. Again, I expected an interaction between category size and the repeated factor of Budget vs. Spending. The difference in willingness to spend between budgeting and shopping should increase as category size gets narrower, leading to a larger planning fallacy for money. I expected this to be similar whether the Budget – Spending discrepancy was calculated based on (Week 1 Budget – Week 1 Spending) or (Week 2 Budget – Week 1 spending). Put differently, I expected category size to produce effects on budgeted amount despite explicit feedback to the subject of a discrepancy between budgeted amount and actual spending in Week 1.

2.2.2 Results

In all analyses discussed below, the unit of analysis is dollars spent or budgeted.

I first tested for the interaction between Category Size and how much money participants budgeted in task 1 or spent in task 2. To test for this interaction, I ran a repeated measure ANCOVA, with Category Size as the between-subject factor, the amount of money participants spent in task 2 (week 1) and the amount of money participants budgeted in task 1 (week 1) as the within-subject factors, and average score on the Tightwad-Spendthrift and Propensity to Plan scales as the covariates.

This interaction was significant ($F_{(2, 329)}=11.56, p<.001$). Both covariates had no significant effects (all $p>.191$).
I then followed up this interaction by an ANCOVA to test for the simple effect of Category Size on Spending in task 2 (i.e., on Spending in Week 1), using the same covariates. This simple effect was significant $F_{(2, 338)}=5.29, p=.005$. Participants spent less money overall in the condition where category size was broad (M=38.58) than where it was narrow (M=48.59, $F_{(1, 338)}=4.16, p=.042$) or very narrow (M=53.81, $F_{(1, 338)}=10.28, p=.001$). The Narrow and Very Narrow conditions did not differ from each other ($p=.264$), which was not surprising as the difference in specificity between these two levels was not dramatic. Both covariates did not have any significant effects (all $p>.254$).

The simple effect of Category Size on Budget in Week 1 was significant $F_{(2, 338)}=5.27, p=.006$). Participants budgeted more money in the condition where category size was broad (M=45.99) than where it was narrow (M=42.96, $F_{(1, 338)}=3.46, p=.064$, marginal) or very narrow (M=40.88, $F_{(1, 338)}=10.39, p=.001$). Again, the Narrow and Very Narrow conditions did not differ from each other ($p=.194$). The covariate Tightwad had a marginal effect in the expected direction: Spendthrifts budgeted more money than Tightwads ($\beta=1.19, t=1.85, p=.065$). The covariate propensity to plan did not have an effect (p=.810).
An equivalent way to report the same analysis is to analyze difference scores. I calculated how much money participants overspent in task 2, relative to how much they budgeted in task 1.

Over-Spending = Spending in task 2 – Budget in task 1

An alternative analysis making the same point is to run an ANCOVA to test for the main effect of Category Size on Over-Spending. This test has the same meaning with the interaction between Category Size and Spending versus Budget in task 1, discussed in the immediately preceding section, except that in one case covariates are predicting levels of dollar amounts and in the latter case they are predicting differences in dollar amounts reflecting Over-Spending. As
predicted, this main effect of category size was significant ($F_{(2, 329)}=11.56$, $p<.001$). Participants under-spent in the Broad condition ($M= -7.28$, reflecting *under*-spending) and over-spent in the Narrow ($M=6.00$, $F_{(1, 329)}=8.99$, $p=.003$) and Very Narrow ($M=13.16$, $F_{(1, 329)}=22.39$, $p<.001$) conditions. Narrow and Very Narrow conditions differed marginally ($p=.099$). The two covariates did not have any significant effects (all $p>.191$.) These results support hypothesis 1.

Figure 4. Dollars Overspent in Task 2 by Category Size

I then compared the three means of Over-spending in the three conditions with 0. The mean Over-spending in the Broad condition was significantly smaller than 0 ($t=-4.58$, $p<.001$). In other words, in the broad condition people spent significantly less than they budgeted. The mean Over-spending the in Narrow condition was marginally larger than 0 ($t=1.51$, $p=.133$). The
mean in the Narrowest condition was significantly larger than 0 (t=3.83, p<.001). That is, people spent significantly more than they had budgeted.

I then tested for the interaction between Category Size and how much money participants budgeted in task 3 versus spent in task 2. To test for this interaction, I ran a repeated measure ANCOVA, with Category Size as the between-subject factor, the amount of money participants spent in task 2 (week 1) and the amount of money participants budgeted in task 3 (week 2) as the within-subject factors, and average score on the Tightwad-Spendthrift and Propensity to Plan scales as the covariates.

The interaction between Category Size and Spending in Week 1 versus Budget in Week 2 was significant F(2, 334)=11.18, p<.001, and had a similar pattern with the last interaction (between Category Size and Budget in week 1 versus Spending in week 1). The covariates did not have any significant main effects nor interactions (all p>.156).

I next ran an ANCOVA to test for the simple effect of Category Size on Budget in task 3, using the same covariates. This simple effect was significant (F(2, 343)=14.23, p<.001) and had a similar pattern with the effect of Category Size on Budget in task 1. Participants budgeted more money overall in the condition where category size was broad (M=44.82) than where it was narrow (M=38.06, F(1, 343)=16.19, p<.001) or very narrow (M=36.58, F(1, 343)=25.02, p<.001). The Narrow and Very Narrow conditions did not differ from each other (p=.347). The covariate Tightwad had a marginal effect in the expected direction: Spendthrifts budgeted more money than Tightwads (β=1.26, t=1.93, p=.055). The covariate propensity to plan had no effect (p=.859).
One might compare my results to those reported by Spiller (2001). Spiller only measured spending, not budget, but he still observed a result such that smaller categories led to less spending, where I find the opposite. This could possibly due to the fact that the units of spending for his participants was money. In the shopping task of my study, they choose amounts in terms of weight (though they budget in dollars). Money is more fungible than weight. Thus, cross-category opportunity cost consideration may be higher when participants process in money than in weight. Thus, the effect of opportunity cost consideration is smaller in the shopping task in this study than in Spiller’s study.
At a deeper level, however, I would say that my model does not necessarily predict that finer categories should produce more spending, because with spending, there is still the matter of calibration between the two offsetting forces of finer categories producing more constraint and finer categories producing more concreteness. What my model does allow me to deduce is that finer categories will curtail budgeted amounts more rapidly than they curtail actual spending, producing a greater tendency for underestimation of spending for finer categories.

In summary, the results of this study support hypothesis 1. This was a simulated shopping study that involved three tasks: budgeting in task 1, shopping in task 2, and budgeting in task 3. In both the budgeting tasks, participants budgeted more money in the condition where they budgeted for broad categories of products than in the conditions where they budgeted for narrower categories of products. In contrast, participants spent less money in the condition where they were made to think of broad categories of products than in the conditions where they were made to think of narrower categories of products. As a result, participants exhibited the planning fallacy for money more when they were made to think of narrower categories of products than when they were made to think of broad categories of products.

The higher budget in the broad category condition, relative to the narrow conditions, cannot be explained by the possibility that participants thought of more products (including ones not available to them in the study) than in the narrow conditions. This is because in in all three conditions, when budgeting, participants were explicitly presented with the list of products that they were budgeting and shopping for. So this list is the same across the three conditions. The only difference between the two conditions is that in the broad condition participants set (i.e., typed in) two budget amounts, while in the narrower conditions, participants set 10 (or more) budget amounts, each for one category of products.
2.2.3 Discussion

This study is one of very few experiments demonstrating a planning fallacy for money. Additionally, in this study, I also successfully employed category size (or the specificity of categories) as a new operationalization of the extent of planning for money that has high ecological relevance to the domain of budgeting.

The results of this study show that individuals’ overall budgets predict their actual overall spending less accurately as they budget for more specific categories of spending. I have not shown evidence of the role of the mediators of concreteness and perceived constraint in producing this interaction. To address the proposed differential effects of concreteness when budgeting relative to when shopping. I propose study 1a, in which I measure the mediator of mindset concreteness, as well as the mediator of perceived constraint, in the budgeting and shopping task. The effect of category size on willingness to spend through perceived constraint has already been demonstrated in previous work by Spiller (2011). So in this study, this measure is only intended for replication of Spiller’s findings. Also, in study 1, I relied on respondents’ general world knowledge of prices to inform their budgeting. One might argue that consumers might behave differently if given explicit information about prices of products in the specific experiment prior to budgeting. I also address one critique of study 1 by exposing respondents to relevant prices of all products before beginning the budgeting task.
2.3 Study 1a: Simulated Shopping and Budgeting Experience

2.3.1 Method

350 participants from mTurk were recruited for this study. Study 1a had similar paradigm, procedure and manipulation with study 1. The only changes from study 1 were:

1) At the beginning of the study, when all products were presented to participants in the sorting task, the product prices were also presented.

2) Study 1a has two conditions instead of three like in study 1. These two conditions were similar to the “Broad” and “Narrow” conditions in study 1.

3) At the end of each main task (i.e., budgeting or shopping), participants filled out different sub-sets of the behavioral identification form (BIF, Vallacher and Wegner 1987). The sub-set of BIF items that participants filled out at the end of the budgeting task was different from the sub-set of BIF items that participants filled out at the end of the shopping task. The BIF sub-sets were counter-balanced across tasks using a Latin square design. Participants’ scores on these sub-sets of the BIF were the measure of concreteness of mindset.

4) Also at the end of each task, participants rated on an 11 – point scale how constrained they think their financial situation in that task was (1 – Not at all constrained to 11 – Extremely constrained).

5) Previously in my dissertation proposal, one of the proposed mediators for the effects of category size on budget and spending was participants’ affect, or liking, for the products. I previously proposed that liking would have mediational effects similar to the effects of concreteness of mindset in the current version of the dissertation. Although differences in
opinions in the dissertation committee resulted in liking being removed from the theoretical model for studies 1 and 1a, there was some division of opinion on the committee, and I continued to find it a plausible mediator. I therefore chose to include it for exploratory purposes in Study 1a. Thus, participants also rated their liking for the products that they budgeted or shopped for in study 1a.

Participants in all conditions were presented with a list of all the products they encountered in study 1a. Participants in the “Broad” condition were presented with two scales, for “Food” and “Beverages”, and rated their liking for the products they were presented with on these two scales. Participants in the “Narrow” condition were presented with ten scales, each for a product category that they would encounter, and rated their liking for the products on these ten scales. The liking score was the average of these two or ten scales.

2.3.2 Results:

Similar to in study 1, an Over-Spending score was calculated:

\[ \text{Over-Spending} = \text{Spending in the First Week} - \text{Budget in the First Week} \]

I then conducted an ANOVA test to compare the means of Over-spending across the two conditions of category size. The between-subject factor was Category Size. The dependent variable was Over-Spending. This test is similar to a test for the interaction between Budget vs. Spending and Category Size using an ANOVA with two factors (Category Size and Budget vs. Spending), and the dependent variable being the dollar amount spent or budgeted. The result of this ANOVA test showed a significant main effect of Category Size on Over-spending.
F_{(1,348)}=13.65, p<.001. People over-spent more in the condition with Narrow category (M=8.26) than in the condition with Broad category (M=-2.34). Thus, the support for hypothesis 1 in study 1 was replicated in study 1a.

I then compared the means of Over-spending in the two Category Size conditions to 0. The mean Over-spending in the Broad condition was not significantly smaller than 0 (t=-1.15, p=.253). In other words, in the broad category condition, people did not spend significantly less than they budgeted. The mean Over-spending the in Narrow condition was significantly larger than 0 (t=4.11, p<.001). That is, people in the Narrow category condition spent significantly more than they had budgeted.
One can also ask the question of whether similar effects of category size will be observed after feedback in week 1 when participants budgets again for week 2 in “Task 3”. To explore this question, I calculated a second measure of discrepancy, between the amount participants spent in week 1, and the budget that they created for week 2, in task 3.

Discrepancy2 = Spending in Week 1 – Budget in Week 2

Then I conducted a similar ANOVA test, with Category Size as a between-subject factor, and Discrepancy2 as the dependent variable. This ANOVA test showed a similar pattern of results with the previous ANOVA test: This discrepancy was greater in the Narrow condition (M=10.55) than in the Broad condition (M=.85, $F_{(1, 348)}=11.03$, $p=.001$). The mean of discrepancy was not significantly different from 0 in the Broad condition ($t=.40, p=.687$), but was significantly different from 0 in the Narrow condition ($t=5.2, p<.001$). These results showed that the effects of category size on participants’ budgets persisted in week 2, despite the feedback on participants’ spending that they received when shopping in week 1.
The main purpose of study 1a was to test mediational relations driving the effects of category size on budgets and spending. I conducted these mediational tests using the bootstrapping technique discussed by Zhao, Lynch and Chen (2010). The independent variable in all of the below mediation tests is Category Size, with Narrow coded as 1, and Broad coded as 2. The mediation tests below have all three mediators included in each test. All mediation tests in this dissertation are conducted in SPSS using Preacher and Hayes’ (2008) script. The results of these mediation tests are presented in the below table, with significant relations in bold.
Table 2. Results of Mediational Analyses of Study 1a

<table>
<thead>
<tr>
<th>Mediator</th>
<th>DV</th>
<th>IV to Mediators (a paths)</th>
<th>Direct Effects of Mediators on DV (b paths)</th>
<th>Mediation 95% Confidence Interval</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>t</td>
<td>p</td>
<td>Beta</td>
</tr>
<tr>
<td>Concreteness 1st time measured</td>
<td>Budget Week 1</td>
<td>0.024</td>
<td>0.739</td>
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<td>Concreteness 2nd time measured</td>
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<td>Budget Week 1</td>
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<td>Spending Week 1</td>
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<td>Liking for Products Week 2</td>
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<table>
<thead>
<tr>
<th>DV</th>
<th>Total Effect of IV on DV</th>
<th>Direct Effect of IV on DV (c' path)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>t</td>
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<td>Budget Week 1</td>
<td>11.895</td>
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<td>Spending Week 1</td>
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</tr>
<tr>
<td>Budget Week 2</td>
<td>10.992</td>
<td>7.605</td>
</tr>
</tbody>
</table>

* IV Category Size: Narrow coded as 1, and Broad coded as 2
  Concreteness: higher number means higher concreteness
  Constraint: higher number means higher constraint
  Liking: higher number means higher liking

Concreteness does not mediate the budget fallacy. From the above summary table, the
mediator concreteness of mindset, as measured by the BIF, was not a significant mediator of the
effects of category size on budget and spending -- All mediations with concreteness as the
mediator have confidence intervals containing 0. In fact, concreteness was not affected by, nor
did it affect, any variables in this study. The three BIF scores were highly correlated.
Correlations are r=.708, .780 and .807, all p<.001.
Liking for products mediates the budget fallacy. Liking for products was another mediator that was expected to have mediational effects in the same directions with the proposed mediational effects of concreteness. That is, I expected that people would like products more if more narrowly categorized, and I expected that more liking would produce more amount budgeted and spent. From the summary table, Liking for products was a significant mediator of the effects of category size on all three variables of interest: budget in week 1 (CI= 0.017, 1.187), spending in week 1 (CI= 0.006, 2.885), and budget in week 2 (CI= 0.007, 1.672). The effects of Liking on budgets and spending were in the expected directions. That is, people budgeted and spent more as they liked products more (β=0.683, t=1.955, p=0.051; β=1.450, t=1.672, p=0.096 marginal; β=0.850, t=2.108, p=0.036). However, the effect of Category Size on Liking was in directions opposite with prediction: The results of this study show that participants liked the products more in the condition with broader category (β=0.655, t=3.356, p=0.001; β=0.762, t=3.914, p<0.001).

Category Size directly affected budgets, but not spending (i.e., the direct effect of IV on DV, c’ path). Broader categories led to higher budgets (β Budget Week 1 =10.347, t=8.068, p<0.001; β Spending Week 1 =0.916, t=0.291, p=0.771; β Budget Week 2 =9.714, t=6.658, p<0.001).

Perceived constraint mediates the budget fallacy in unexpected ways. The level of resource constraint that participants perceived in the task was another mediator tested in study 1a. From the summary table, perceived resource constraint was a significant mediator of the effect of category size on budget in week 1 (CI=0.301, 2.220) and budget in week 2 (CI=0.110, 1.458), but not on spending in week 1 (CI=-0.329, 1.705). This is slightly different from my expectation as I expected that constraint would be a mediator for both budget and spending.
The direct (partial) effects of perceived resource constraint on all three dependent variables of interest, budget 1, spending, and budget 2, were all significant. However, the b paths were all in the opposite directions with my predictions: In these data, higher perceived constraint made people budget and spend more ($\beta=0.644$, $t=6.466$, $p<0.001$; $\beta=0.563$, $t=2.422$, $p=0.016$; $\beta=0.408$, $t=3.623$, $p<0.001$). Additionally, the effect of category size on perceived constraint was also significant and in the opposite directions with my predictions: In these data, broader categories made participants feel more constrained in the two budgeting tasks ($\beta=1.780$, $t=2.599$, $p=0.010$; $\beta=1.536$, $t=2.233$, $p=0.026$). The increase in perceived constraint in the broad category could potentially be due to the “fudge factor” discussed by Ülkümen, Thomas, and Morwitz (2008). That is, it is possible that when people were presented with only two broad categories, they were less certain that they thought of all the items they needed to buy. So they added a “fudge factor” for their uncertainty, by adjusting estimates of their spending upward, which made them feel more financially constrained.

The figure below shows the updated model of study 1a, as supported by the data.
2.3.3 Discussion

I suspected that the significant mediational results that are in the opposite directions with my predictions, for Perceived Constraint, could potentially be due to the fact that these mediators were measured after participants already completed the main tasks. That is, participants indicated how financially constrained they felt after they already budgeted or shopped, so constraint was a
consequence of amount budgeted or spent rather than a cause. Thus, participants could potentially feel more financially constrained after budgeting or spending simply because they budgeted, or spent most of their funds in that task, and do not have much funds left. Thus, measuring these mediators after participants have already completed the focal tasks could have rendered these results an artifact of the study procedure, rather than reflecting the theoretical relations among these variables.

To empirically test this suspicion, I ran study 1b, a replicate of study 1a, with the mediators measured after the sorting task, but before participants budgeted or shopped. The only purpose of study 1b was to explore whether changing the timing in which the mediators was measured would change the directions of the relations among these variables. Thus only two tasks were included: budgeting for grocery consumption over one week, and shopping for groceries based on that budget, for the same week. Because concreteness was not affected, nor did it affect, any variables in study 1a, it was removed from study 1b. We will see that this change in procedure reversed the effect of category size on perceived constraint, but it did not change the effect of constraint on budget and spending much.
2.4 Study 1b – Replicating Study 1a, Measuring Mediators Before Budgeting and Shopping Tasks

2.4.1 Method

300 mTurk participants were recruited for this study. Again, study 1b only differed from study 1a in three aspects:

1) Only two main tasks were included instead of three: budgeting for one week, and shopping for that same week.
2) The variable concreteness of mindset was removed.
3) The mediators Liking for products and perceived financial constraint were measured after the sorting task, but before participants budgeted and shopped. On the page where the mediator Perceived Constraint was measured, participants were presented with the list of products that they would encounter in the study. They were told that they would budget, and shop for those products for enough consumption over one week. They were told that their grocery consumption over one week was typically about $50 dollars. And participants were then asked to rate how constrained they felt their financial situation would be for those budget and shopping tasks. Participants then rated their Liking for products using similar scales and instructions with study 1a, before moving onto the tasks of budgeting and shopping.

2.4.2 Results:

Again, the findings in studies 1 and 1a, that people over-spent more when category size was narrow (M=10.95) than when it was broad (M=-2.48) were replicated ($F_{(1, 293)}=7.03, p=.008$).
The mean over-spending was significantly greater than 0 in the narrow condition \((t=2.61, p=.010)\), but not in the broad condition \((t=-.86, p=.392)\).

Figure 9. Mean Over-Spending by Conditions of Category Size
(Over-Spending = $ Spent - $ Budgeted)

I next conducted mediational tests, similarly to in study 1a, with the two mediators Liking for products and Perceived financial constraint. The IV in all tests was category size, with Narrow = 1 and Broad = 2. Each mediation test includes both mediators in the model. The table below summarizes the results of these mediation tests, with significant relations in bold.

From the below table, changing the timing with which the two mediators were measured did change the direction of the effect of category size on perceived constraint (marginal), but not the direction of the effect of category size on liking. Although now the effect of category size on perceived constraint is marginal, broader categories reduced perception of constraint, consistent
with my predictions (β=-1.21, t=-1.56, p=0.120; β=-1.29, t=-1.65, p=0.100). The effect of category size on liking remained the same as in study 1a: Bigger categories increased liking ratings for products (β=0.58, t=2.80, p=0.006; β=0.56, t=2.67, p=0.008).

The mediational path from category size to budget and spending, through perceived constraint, was no longer significant (CI=−1.664, 0.041; CI=−0.051, 3.152). The mediational path from category size to budget and spending, through liking, was still significant (CI=0.328, 2.341; CI=0.642, 5.933). Opposite to my expectations, broader categories resulted in stronger liking.

Consistent with my expectations, stronger liking led to higher budget and spending.

Category Size had a direct effect (c’ path) on Budget (β=8.192, t=3.987, p<0.001), but not Spending (β=−5.671, t=−1.171, p=0.243). Broader category resulted in higher budget.

Table 3. Results of Mediation Analyses of Study 1b

<table>
<thead>
<tr>
<th>Mediator</th>
<th>DV</th>
<th>IV to Mediators (a paths)</th>
<th>Direct Effects of Mediators on DV (b paths)</th>
<th>Mediation 95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beta        t    p</td>
<td>Beta       t    p</td>
<td>Lower</td>
</tr>
<tr>
<td>Constraint</td>
<td>Budget</td>
<td>-1.211</td>
<td>-1.560</td>
<td>0.120</td>
</tr>
<tr>
<td>Constraint</td>
<td>Spending</td>
<td>-1.290</td>
<td>-1.651</td>
<td>0.100</td>
</tr>
<tr>
<td>Liking</td>
<td>Budget</td>
<td>0.581</td>
<td>2.796</td>
<td>0.006</td>
</tr>
<tr>
<td>Liking</td>
<td>Spending</td>
<td>0.557</td>
<td>2.666</td>
<td>0.008</td>
</tr>
</tbody>
</table>

<p>| DV | Total Effect of IV on DV | Direct Effect of IV on DV (c’ path) |</p>
<table>
<thead>
<tr>
<th></th>
<th>Beta t p</th>
<th>Beta t p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>8.731</td>
<td>4.202</td>
</tr>
<tr>
<td>Spending</td>
<td>-2.747</td>
<td>-0.570</td>
</tr>
</tbody>
</table>

* IV Category Size: Narrow coded as 1, and Broad coded as 2
Constraint: higher number means higher constraint
Liking: higher number means higher liking
For ease of comparing the results from studies 1a and 1b, the mediation results in table 2 are presented again below without the mediator concreteness.

Table 2. Results of Mediational Analyses of Study 1a*

<table>
<thead>
<tr>
<th>Mediator</th>
<th>DV</th>
<th>IV to Mediators (a paths)</th>
<th>Direct Effects of Mediators on DV (b paths)</th>
<th>Mediation 95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beta</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>Constraint Budget Week 1</td>
<td>Budget Week 1</td>
<td>1.780</td>
<td>2.599</td>
<td>0.010</td>
</tr>
<tr>
<td>Constraint Spending Week 1</td>
<td>Spending Week 1</td>
<td>0.620</td>
<td>0.851</td>
<td>0.396</td>
</tr>
<tr>
<td>Constraint Budget Week 2</td>
<td>Budget Week 2</td>
<td>1.536</td>
<td>2.233</td>
<td>0.026</td>
</tr>
<tr>
<td>Liking for Products Week 1</td>
<td>Budget Week 1</td>
<td>0.652</td>
<td>3.331</td>
<td>0.001</td>
</tr>
<tr>
<td>Liking for Products Week 1</td>
<td>Spending Week 1</td>
<td>0.655</td>
<td>3.356</td>
<td>0.001</td>
</tr>
<tr>
<td>Liking for Products Week 2</td>
<td>Budget Week 2</td>
<td>0.762</td>
<td>3.914</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DV</th>
<th>Total Effect of IV on DV</th>
<th>Direct Effect of IV on DV (c' path)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>t</td>
</tr>
<tr>
<td>Budget Week 1</td>
<td>11.895</td>
<td>8.945</td>
</tr>
<tr>
<td>Spending Week 1</td>
<td>2.163</td>
<td>0.694</td>
</tr>
<tr>
<td>Budget Week 2</td>
<td>10.992</td>
<td>7.605</td>
</tr>
</tbody>
</table>

* IV Category Size: Narrow coded as 1, and Broad coded as 2
Concreteness: higher number means higher concreteness
Constraint: higher number means higher constraint
Liking: higher number means higher liking

Below is a simpler version of table 3, which shows the results of the mediations where the IV is Category Size (Narrow = 1, Broad = 2), the mediators are Constraint and Liking, and the DV is OverSpending (= Spending – Budget). The mediations in this table are testing the idea that the slope of the effect of each mediator on budget is different from the slope of the effect of each mediator on spending. From the table below, the effect of category size on overspending through both mediators are significant (CI Constraint = .025, 4.064; CI Liking = .095; 4.452).
This suggests that the slope of the effect of each mediator on budget is different from the slope of the effect of each mediator on spending.

Table 3a. Results of Mediation Analyses of Study 1b with Overspending as DV

<table>
<thead>
<tr>
<th>Mediator</th>
<th>DV</th>
<th>IV to Mediators (a paths)</th>
<th>Direct Effects of Mediators on DV (b paths)</th>
<th>Mediation 95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beta</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>Constraint</td>
<td>OverSpending</td>
<td>-1.290</td>
<td>-1.651</td>
<td>0.100</td>
</tr>
<tr>
<td>Liking</td>
<td>OverSpending</td>
<td>0.557</td>
<td>2.666</td>
<td>0.008</td>
</tr>
</tbody>
</table>

* IV Category Size: Narrow coded as 1, and Broad coded as 2
  Constraint: higher number means higher constraint
  Liking: higher number means higher liking

Another way to test that the slope of the effect of the two mediators on budget differed from the corresponding slope on spending is to regress “Over-spending” (= Spending – Budget) on Liking and Constraint. Any effect of each predictor on this difference score is tantamount to an interaction such that the slope of constraint on budget is more positive than the slope of the effect of constraint on spending, and the slope of the effect of liking on budget is shallower than the effect of liking on spending.

Over-Spending = β₀ + β₁Liking + β₂Constraint

The results show that Liking is not a significant predictor of this difference score (β=1.589, t=1.160, p=.247), but Constraint is (β=-.862, t=-2.338, p=.020). Thus, the slope of
constraint on budget is more positive than the slope of the effect of constraint on spending, but the slope of the effect of liking on budget is not shallower than the effect of liking on spending.

The figure below shows the model of study 1b as supported by the data.
Figure 10. Model from Data of Study 1b

* Dotted lines denote marginal relations.
** Signs and arrows in red denote difference from predictions.

For easier reference, below is the model that I predicted again:

Task: budgeting (0) vs. spending (1)
2.4.3 Discussion

In studies 1, 1a and 1b, I explored the consequence of category size on willingness to spend. The results of study 1 show that the difference between willingness to spend between the budgeting and the shopping stage increases as category size gets narrower. Specifically, people increasingly spent more than they budgeted as category size gets narrower. This finding is replicated in studies 1a and 1b. Study 1a was designed to test mediational relations hypothesized from the results of study 1. The results show that the amounts of money that people spent or budgeted were driven by how much people like the products, as well as how constrained people found their financial situation in the task to be. The hypothesized mediator concreteness of mindset was not a driver of the budget and spending patterns.

Consistent with predictions, broader categories made people perceive (marginally) less financial constraint. Contrary to predictions, perception of higher constraint led to higher budget. Consistent with predictions, higher constraint led to (nonsignificantly) lower spending.

Broader categories also made people like products more, opposite to my predictions. Increased liking for products led to higher budget and spending, consistent with predictions.

Study 1b was designed to test whether the surprising findings in study 1a was due to the order in which the measures were collected. The results showed that most of the findings in study 1a still held even when the mediators were measured before the main tasks, where the main dependent variables were collected. That is, I again observed that narrower categories lead to a higher planning fallacy, as reflected in (Actual Spending – Budget) Overspending measures. Again, I observe that broad categories lead to more liking and more liking leads to more budget and spending. What changed is that now, as I had originally expected, narrower categories lead
to more perceived constraint, although this relation was marginally significant. This was consistent with my predictions. Most other results of study 1a were replicated in 1b, showing that these results were not artifacts of the order in which the mediators were measured in these studies.

One interesting question to explore is whether individuals’ judgment of the accuracy of their budgets corresponds with reality. In the next section, I explore how the specificity of budgets affects individuals’ confidence in the accuracy of their budgets. Individuals’ confidence in their budgets will affect how decisive people are when considering whether to take on additional unplanned spending. The effect of category size on planners’ confidence in the accuracy of their plans will be explored in the next section and in study 2.
Chapter 3. The Effect of Planning for Broad Versus Unpacked Categories on Planners’ Confidence

3.1 Conceptual Background

When people make estimates of task completion times, or estimates of money to be spent, their confidence in their judgment affects their willingness to act on these estimates. For example, one’s confidence in completing a task early leads one to believe that one will have much spare time available for other activities. As a result, one will be very decisive when deciding whether to take on additional activities. In contrast, lower confidence in one’s estimates will lead to less decisiveness when deciding whether to take on additional activities. One indicator of decisiveness is the time it takes one to make that decision. If one thought one had spare time and is confident, one should say “Yes” more rapidly the more confident one is. If one thought one had insufficient spare time, one should say “No” more rapidly the more confident one is.

Broad, general budgets or plans provide a larger window of occurrence (for example, the frequency of eating out per month) relative to more specific, narrow budgets (or plans) (for example, the frequency of eating out per week). In the same mechanism that central limit theorem proposes, a larger window of occurrence should make the occurrence of resource demands seem more regular than a smaller window of occurrence does. Thus, unpacking budgets into narrower, specific sub-budgets should reduce the perceived regularity of resource demands within that budget, as the window for occurrence of resource demands becomes shorter (e.g., the window of occurrence changes from one month to one week).

H2a: The broader the category, the more people perceive regularity from period to period in the resources expended.
As the window for occurrence decreases, the perceived regularity of resource demands within each window should also decrease (in the same way central limit theorem works). Menon (1993) shows that individuals can estimate behavioral frequency using summary rates of occurrence/usage stored in memory if the behavior appears regular, but not if it appears irregular. Thus, because behavior or usage situation should have more regularity in a bigger budgeting/planning window than in a smaller window, I expect that individuals can rely on summary rates of occurrence more in the former than in the latter case. Menon shows that when individuals estimate the frequency of irregular behavior, they are more likely to use a recall-and-count strategy based on episodic recall. From the above analysis, I expect that individuals rely on summary rates of occurrence more when the budgeting/planning involves big window than when it involves smaller window. The above discussion uses examples and terminologies that refer to duration of time. But the same reasoning applies to “windows” in terms of how broad or specific a category of product or activity is. Thus, individuals should rely more on summary rates stored in memory when budgeting for broad categories than for narrow categories.

I expect that forecasting using summary rates versus using a recall-and-count strategy based on episodic recall have differential consequences on consumers’ confidence in their estimates, including estimates of resources spent, and of spare resources. Differential confidence in the accuracy of estimates of spare resources leads to differential decisiveness when considering spending resources on additional purchases or activities. I expect that estimating using summary rates engender more confidence than using a recall-and-count strategy, except when recalling and counting some very small and recent set of events.

**H2b:** Budgeting for broad product categories will result in higher confidence in one’s budget estimate from planners than budgeting for narrow product categories.
H2c: Prior Budgeting for broad product categories will lead to higher decisiveness in participants when they decide whether to incur an additional purchase.

Hypotheses 2a, 2b and 2c are tested in the next study.

Figure 11. Theoretical Model of Study 2

![Diagram showing the theoretical model of Study 2 with arrows indicating category size to perceived regularity to confidence to decisiveness of spending decision]
3.2 Study 2: Simulated Shopping and Budgeting Experience

3.2.1 Method

Study Overview

This study has 2 conditions (Category size: broad vs. narrow). The two levels of category size are manipulated similarly to the two conditions “Broad” and “Narrow” in studies 1, 1a and 1b. The study has similar paradigm and manipulation with study 1, with 4 tasks of shopping and budgeting: Task 1 is budgeting for week 1; task 2 is shopping for week 1; task 3 is budgeting for week 2; and task 4 is shopping for week 2. Similar to study 1, one different set of 10 products is used for each week. 348 participants from mTurk were recruited for this study.

Table 4. Study 2 Organization

<table>
<thead>
<tr>
<th>Task 1</th>
<th>Task 2</th>
<th>Task 3</th>
<th>Task 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeting</td>
<td>Shopping</td>
<td>Budgeting</td>
<td>Shopping</td>
</tr>
<tr>
<td>Week 1</td>
<td>Week 1</td>
<td>Week 2</td>
<td>Week 2</td>
</tr>
<tr>
<td>First set of 10 products</td>
<td>Second set of 10 products</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Procedure and measures:

Similar to study 1, participants first saw a list of 40 products, presented with their prices.

*Manipulation of category size similar to studies 1, 1a and 1b:* Also similar to study 1, participants divided this list into either 2 categories (broad category condition) or 20 categories (narrow category condition). All the categories had fixed labels that were provided to participants.

Participants went through two weeks of budgeting and shopping, with four total main tasks. Task 1 was budgeting for the first week. Task 2 was shopping for the first week. Task 3 was budgeting for the second week. And task 4 was shopping for the second week. A different set of products was used for each week, just like in studies 1 and 1a. In tasks 1 and 3, participants were told that their spending on groceries was typically about $50 for each week, but they could budget or spend however much that they wanted, and were then asked to set a budget for each of either 2 broad categories or 10 narrow categories. In tasks 2 and 4, participants saw feedback of how much they had spent in each of either 2 broad categories or 10 narrow categories, as well as their total spending. Also similar to study 1, in the shopping task, participants were always presented with a list of 10 products they were going to shop for. For each product they shopped for, participants saw two options, one cheaper than the other, and both with their prices. Participants entered into two text boxes how much of each option they would buy, in weight. The survey was programmed such that the survey will automatically multiply the weight participants entered with the product price, resulting in the amount of dollars spent on products.

*DV – Confidence:* After task 2, participants were told that they needed to budget again for another week. They were told again that their weekly spending on groceries is about $50, but
they could budget and spend however much that they wanted. Then, similar to task 1, participants were presented with the products they would encounter in week 2, and were asked to set a budget for each of the 2 broad or 10 narrow categories for week 2. After creating a budget for the second week, participants were asked to rate on 11-point scales:

1) how confident they felt about the accuracy of their new budget in predicting their spending, from 1-Not confident at all to 11 – Very confident.

DV – Time spent: After participants had completed the first two tasks of budgeting and spending for week 1 (tasks 1 and 2), participants budgeted for another week (task 3). After creating a budget in task 3, which had no mention of chocolate, they were presented with an appealing product not in their original list of product, i.e., a small box of Godiva chocolate, with its price. They were asked to imagine encountering this product. They were then asked to indicate whether they thought they could buy that product, and still afford what they needed for the week, by choosing “Yes” or “No”. The time participants spent answering this question was measured, and is the second DV.

After rating their confidence about the accuracy of their new budget, and answering the question about affording the unexpected box of chocolate, participants shopped for the new products that they just budgeted for in task 3. Just like in study 1, these products in the second week were different from the products in the first week.

Mediator - Regularity: After this shopping task, participants rated how regular they felt their weekly spending was from week to week, from 1-Very irregular to 11 – Very regular. The scale to measure regularity has two items: The first item asked participants to rate the regularity
of their spending in the categories of groceries. The second question asked participants to rate the regularity of their overall spending on groceries.

*Covariates:* Also similar to study 1, participants filled out the scales for propensity to plan for money in the next few weeks.

### 3.2.2 Results:

I expected a main effect of category size on both DVs -- confidence about the accuracy of budget, and the amount of time participants spent deciding whether they could afford the unplanned purchase. Participants in the broad category condition should exhibit higher confidence and spend less time than those in the narrow category condition. I also expected that perceived regularity of weekly spending will be greater with broad than with narrow categories, and that these ratings of regularity will mediate the effects of category size on confidence ratings. That implies that higher perceived regularity of spending will lead to higher confidence in the accuracy of budgets.

Again, for easier reference, below is the theoretical of study 2.

**Theoretical Model of Study 2**

![Theoretical Model of Study 2](image)

To test these predictions, I ran a sequential mediation test using the bootstrapping technique discussed in Hayes (2013, Process model 6). The DV was the amount of time participants spent deciding whether they could buy the chocolate and still afford what they needed to buy for the week. The IV was category size, Narrow = 1 and Broad =2. The two mediators were perceived regularity of spending, and participants’ confidence about the accuracy
of their budgets in predicting their spending. Two covariates were included: propensity to plan and scores on the tightwad-spendthrift scales. The results are summarized in the table below.

Table 5 – Results of First Mediational Analysis of Study 2 (IV: Category Size)

<table>
<thead>
<tr>
<th>Mediator</th>
<th>DV</th>
<th>IV to Mediators (a paths)</th>
<th>Direct Effects of Mediators on DV (b paths)</th>
<th>Mediation 95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beta</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>Regularity</td>
<td>Time Spent Answering Question</td>
<td>0.037</td>
<td>0.169</td>
<td>0.866</td>
</tr>
<tr>
<td>Confidence</td>
<td>Time Spent Answering Question</td>
<td>-0.055</td>
<td>-0.240</td>
<td>0.811</td>
</tr>
</tbody>
</table>

The results from the above table showed that the hypotheses about the effects of category size on the DV time spent deciding, through two mediators -- perceived regularity of spending and confidence about the accuracy of budgets, were not supported. The two mediators did not affect the DV, nor were they affected by the IV, nor did the IV affect the DV. I suspect that the absence of any effects could be because my DV, response time, is a very noisy measure.

I next ran another mediational analysis to test for the effects of perceived regularity on time spent through confidence. So in this second mediational test, perceived regularity was the IV, confidence was the mediator, and time spent was the DV. The results are summarized in the table below.
The results from the above table showed that although the mediational path was not significant (CI=−1.728, 0.214), the prediction that higher perceived regularity of spending led to higher confidence in the accuracy of budgets was supported (β=.455, t=8.98, p<.001). Again, the power of the tests of the indirect path were likely compromised by my use of a single noisy response time as a measure of decisiveness and choosing whether or not to buy the unexpected chocolates.

Additionally, one idea that was suggested during the dissertation proposal meeting was that the probability of participants’ choosing “Yes” when asked about the unplanned item, i.e., the probability that they think they can buy the item and still afford what they planned to buy for the week, should correspond to how much they budgeted more in the broad condition, than in the narrow condition. In the Broad condition, higher budget should lead to lower probability of choosing “Yes”, and lower budget should lead to higher probability. In other words, the slope of the (negative) effect of budget on saying Yes to the chocolates should be greater in the broad
condition that was expected to generate more confidence. This relation should be weaker, or absent, in the Narrow condition. That is, people’s estimate of their budget should be more accurate in the broad condition than in the narrow condition.

To test this idea, I first mean centered Budget for the Second Week. I then ran a regression model, predicting whether participants chose “Yes” (2) or “No” (1) based on participant’s Budget for the Second Week Mean-Centered, the Category Size condition participants were in (Narrow = 0, Broad = 1), and the interaction between Budget for Second Week Mean-Centered and Category Size condition. The results of this model showed that the higher participants’ budgets were, the less likely they would choose “Yes” (β=-0.020, t=-3.330, p=0.001). Participants in the Broad condition were less likely to choose “Yes” (β=-0.153, t=-2.781, p=0.006). The interaction was significant, which showed that the effect of Budget on the likelihood of choosing “Yes” become more positive in the Broad condition than in the Narrow condition (β=0.011, t=3.015, p=0.003). The direction of this interaction is contrary to the prediction suggested in the dissertation proposal meeting: The data show that as participants budgeted more, they were less likely to say they could afford the unplanned product as I expected. Contrary to my expectations that greater confidence in the broad condition would translate to a greater reliance on budgets and slack estimates for broad than for narrow conditions, this pattern is less strong in the Broad condition than in the Narrow condition.
Figure 13. Study 2 Results: Effects of Category Size on Perceived Regularity of Spending and Confidence about Accuracy of Budget
Finally, although the effect of category size on over-spending is not central to this study, I wanted to see whether this finding in studies 1, 1a, and 1b replicates here. That is, whether the difference between participants’ budget and spending increases as category size gets narrower, such that participants increasingly spend more than they budget as category size gets narrower. Thus, I calculated a variable called “Over-spending”, similarly to in studies 1, 1a and 1b.

I then ran a repeated measure ANOVA. The DV was Over-spending. The within-subject factor was Week 1 vs. Week 2. And the between-subject factor was Category Size (Broad vs. Narrow). The results replicated the findings in the previous three studies. In Week 1, participants over-spent in the Narrow condition (M=6.61) more than in the Broad condition (M=7.52, t=-5.12, p<.001). Despite the feedback that participants received about their spending in week 1, this pattern persisted in week 2: Participants over-spent in the Narrow condition (M=1.99) more than in the Broad condition (M=-7.59, t=-5.32, p<.001).
Figure 12. Mean Over-Spending in Each Week by Conditions of Category Size (Over-Spending\(_t\) = Spending\(_t\) – Budget\(_t\))
3.2.3 Discussion

In summary, the results of this study show that perceived regularity of spending affects one’s confidence in the accuracy of one’s predictions of that spending. Other hypotheses in this study, about the effect of category size on perceived regularity, and in turn on one’s decisiveness when determining whether to take on additional expenditures, were not supported. The absence of any effects could be because my DV, response time, is a very noisy measure.

In the previous sections, and studies 1, 1a, 1b and 2, I explored several consequences of category size on budgeting. In these studies, category size was manipulated. However, I expect that there are endogenous factors that determine which level of categorization individuals assign products or activities into. In the subsequent sections, I explore several determinants of category size. In the next section and study 3, I focus on the effects of a relatively long-lasting individual tendency, specifically propensity to plan, as well as a more short-term factor, specifically one’s liking for products, on one’s level of categorization.
Chapter 4. Do Consumers Assign Products into Broad or Narrow Categories to Convince Themselves that They Have More Slack?

4.1 Conceptual Background

4.1.1 Motivated Level of Categorization

Thus far in my dissertation, I have explored the effects of exogenously being endowed with broad versus narrow budget categories. But when consumers choose their categorizations spontaneously, what guides their choice of broad versus narrow categories? Would you assign “a dinner with friends at a restaurant with live music” to your “food” budget or your “entertainment” budget? Cheema and Soman (2006) show that the answer depends on how much funds one has available in each of these budgets. Individuals are motivated to post ambiguous expenses into the budget that has more funds available.

The above example involves an ambiguous expense that can be categorized into either “food” or “entertainment.” But, when expenses are not ambiguous, will people still flexibly post expenses into inconsistent mental accounts? What factors drive people to categorize purchases flexibly? In this research, I am specifically interested in studying when people categorize purchases into a narrow account and when they would categorize the same purchases into a broader account. I expect that liking for the proposed expenditure creates motivation for one to post a purchase into a broad account instead of a narrow one. For example, imagine that during your house remodeling project, you come across a beautiful chandelier that you would really like to buy. If the chandelier will make you overspend on your current “lighting” budget, will you strategically find a broader account, such as “furniture” to post it to? A less attractive chandelier should be less likely to prompt flexible posting.
Even if an unambiguous appealing purchase does not make one over-spend on one’s budget for that product category, existing research suggests that one may still feel motivated to post strongly liked purchases to broad categories instead of narrow categories. Spiller (2011) finds that relative to broad categories, narrow categories prompt one to feel a sense of resource constraint more. Together with Cheema and Soman’s (2006) findings, these lines of research suggest that one may be motivated to reduce the sense of resource constraint by posting strongly liked purchases to broad mental categories rather than narrow mental categories. This tendency should be smaller, or absent, for less liked purchases.

**H3a: Individuals tend to post strongly liked purchases to broader mental categories than they do less liked purchases.**

If individuals post purchases they like strongly into broader mental categories because these categories weaken the sense of resource constraint, this tendency should increase the amount of spare resources (i.e., resource slack, Zauberman and Lynch 2005) that individuals perceive in the broad categories. The stronger the tendency to post strongly liked purchases into broad categories, the higher should be perceived spare resources.

**H3b: Individuals’ tendency to post strongly liked purchases to broader mental categories increases the perceived resource slack in the category posted.**

Available funds and liking are two situational factors that drive which mental category a purchase is posted to. However, individuals of course have stable natural categories in which they frequently categorize purchases, and which natural category a purchase is put into may not be the same across people. Natural categorization, however, is not the focus of this paper. (For

4.1.2 Individual Differences in the Tendency to Unpack Categories When Planning: People with High Propensity to Plan Tend to Unpack Categories into Small Sub-Components More Than People with Low Propensity to Plan.

I propose that the level of detail or specificity of spontaneously chosen categories is also a positive function of propensity to plan for the use of money (Lynch et al. 2010). People high in propensity to plan for the use of a particular resource set goals more often in that domain, think about subgoals and means of achieving goals, think about constraints and interdependencies, and like to plan rather than being spontaneous. In the domain of planning for purchases, how detailed, specific the plan is can be measured by the extent to which the budget is broken down from a broad, general category, to narrow, specific sub-categories. Thus, high propensity to plan as measured by Lynch et al.’s scales should correlate positively with a strong tendency to unpack categories when planning. I also aim to examine this hypothesis in the next study.

H4a: Individuals with high propensity to plan tend to think in terms of narrow categories more when planning.

I expect that high propensity to plan not only produces a bias toward use of narrower categories, but also constrains one’s ability to delude oneself that one has more spare resource for liked than for less liked proposed expenditures. Thus, the effect of liking on individuals’ tendency to post purchases into broad categories (hypothesis 3a) (through resource slack) should be weaker for people with high propensity to plan.

H4b: Individuals’ tendency to post strongly liked purchases into broad categories is weaker for people with high propensity to plan for money.
Hypotheses 3a, 3b, 4a and 4b are tested in the next study.

Figure 15. Theoretical Model of Study 3

4.2 Study 3: Liking and Propensity to Plan Affect Product Categorization

4.2.1 Method

Study Overview:

This study has all variables measured within-subject. 300 participants from Amazon Mechanical Turk were recruited to participate in this study.

Procedure and Measures:

The main measures were collected in the following order: First, propensity to plan was measured. Second, level of categorization was measured. Third, participants’ liking for products was measured. Fourth, money slack in selected categorization level was measured. It has been found previously that people who are more knowledgeable about a product categorize it more narrowly. Thus, participants’ knowledge about the products will also be measured as a covariate, and fifth main measure. Finally, demographics data are collected.
Propensity to Plan: Participants’ propensity to plan for money in the long run will be measured at the beginning of the study, using Lynch et al.’s scales (2010).

Level of Categorization: Participants were presented with 20 product categories in random order. They were asked to check off all the products categories in this list that they had purchased in the last year. On the next page, participants were presented with specific products from the product categories that they checked off in the previous page. Participants were told to imagine that they were encountering these products in real life. They were asked to type into a textbox the product categories that they normally categorize each of these products into. On the next page, participants were presented with the products they selected again, as well as the product category that they typed into the textbox on the previous page. For each product, participants were presented with a 5-point scale. Each point on the scale was one level of category breadth to categorize the product into, with 1 being the narrowest category and 5 being the broadest. Participants were asked to choose the level of categorization on the scale that is closest to the category that they previously typed into the textbox. For example: Product “the Shawshank Redemption movie” was presented with a scale with five categorization levels. The narrowest level on this scale is “Classic Crime & Drama movies”, the second narrowest level on this scale is “Classic movies”, the next level on this scale is “Movies”, and the next level on this scale is “Entertainment”. Participants essentially judged where the freely chosen category label they had generated earlier fell within this ordering, allowing me to scale individual responses.

Liking: Participants were then presented with the 20 product categories that they saw at the beginning of the study, and indicated their liking for each product, each on a scale from 1 – Strongly Dislike to 11 – Like Very Much. The order that the products were presented was randomized.
Money slack: Participants were presented with the text string for the categorization level that they generated for each product. For the selected level of categorization for each product, participants rated on an 11-point scale how much spare money they thought they had in that category, from 1 – Very little spare money to 11- Lots of spare money.

Knowledge: I suspected that individuals who know more about a product will have more experience with it, and thus, more expertise about a product will lead to narrower categorization of that product. Thus, the level of knowledge participants had about each product was also measured. For each product, participants were asked to rate how much they know about the product on an 11 point scale ranging from 1 – I do not know this product to 11- I know this product extremely well.

After this task, participants filled out demographics variables.
4.2.2 Results:

Just like in previous studies, scores on the propensity to plan scales were averaged.

Firstly, propensity to plan was mean centered. Secondly, I subtracted 6 from the 1 to 11 liking judgments, so that liking is then scored -5 to + 5, with 0 now reflecting neutrality. I did not rescale the 1 to 11 “spare money” scale, because this is a unipolar concept. Knowledge scores were mean-centered. The categorization scales have 1 as the narrowest level and 5 as the broadest level.

First, for each subject, the level of categorization for each product was regressed on individual level liking for each product, controlling for participants’ knowledge about that product, yielding an intercept and slopes at the individual subject level.

\[ \text{Category Breadth}_{ij} = \beta_{0j} + \beta_{1j} \times \text{Liking}_{ij} + \beta_{2j} \times \text{Knowledge}_{ij} + \epsilon_{ij} \]

where: j is respondent j and i is product i.

Then, those intercept and slope terms for Liking were regressed on propensity to plan.

\[ \beta_{0j} = a + \gamma_{1} \times \text{Propensity to Plan}_{j} + \epsilon_{0}^{'}_{ij} \]
\[ \beta_{1j} = c + \gamma_{2} \times \text{Propensity to Plan}_{j} + \epsilon_{1}^{''} \]

H3a implies that the average slope \( \beta_{1} \) is positive – that is, people assign more well-liked products to broader categories. H4a implies that the individual subject intercept \( \beta_{0} \) (predicted level of categorization for a product with neutral valence) is lower for subjects higher in propensity to plan, reflected in a negative coefficient \( \gamma_{1} \) of propensity to plan on intercept \( \beta_{0j} \). H4b implies that the individual subject slopes are shallower for subjects higher in propensity to plan, reflected in a negative coefficient \( \gamma_{2} \) of propensity to plan on slope \( \beta_{1j} \).
I estimated a hierarchical linear model for these equations using the software package SPSS. I predicted that this interactive pattern on categorization was mirrored by a similar pattern on perceived slack, and that the level of categorization mediated similar effects on individual subject slack parameters. The below tables show the results of the hierarchical linear models. Table 7 shows predictors of category breadth level chosen. Table 8 shows predictors of perceived slack. Each of the tables has two sections: The section on the left shows the results of the level 1, within-subject model -- regression model (1) above, predicting Category Breadth using Liking and Knowledge for each subject. Each row shows the statistics of the intercept $\beta_0$, of the coefficient $\beta_1$, and of the coefficient $\beta_2$ in this model. The mean of these coefficients, across subjects, are shown in the column “Beta Mean”. These beta means are compared with 0, and the columns “t” and “p (2-tailed)” show the statistical significance of these tests comparing the mean Beta with 0.

The second section, on the right of each table, shows the results of the level 2, across-subject models, i.e., models (2) and (3) above. Each row in this section shows the results of predicting the intercept or coefficient in question. Gamma 1 tests whether the average category breadth used is narrower for people higher in propensity to plan. Gamma 2 tests whether the surprising tendency to use narrower categories for better liked products depends on Propensity to Plan scores. For example, the first row of the section on the right in the table immediately below shows the results of predicting the intercept $\beta_0$ of the level 1 model using Propensity to Plan, i.e., it shows the results of model (2).

The second row of the section on the right of each table below shows the results of predicting the coefficient $\beta_1$ of the level 1 model using Propensity to Plan, i.e., it shows the results of model (3) predicting the slope of the effect of liking and breadth of categorization
(Table 7) or Perceived Slack (Table 7). In the section on the right of the tables, the columns “Beta of PTP” show the coefficients of Propensity to plan in the regression models (2) and (3), and the columns “t” and “p” show the statistical significance of these coefficients of Propensity to Plan.

Table 7 – Study 3 Results from Hierarchical Linear Models (DV: Category Breadth; 1= Narrowest, 5= Broadest)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Beta Mean</th>
<th>Beta Std. Error</th>
<th>t</th>
<th>p (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept β₀j</td>
<td>299</td>
<td>3.10</td>
<td>0.07</td>
<td>44.212</td>
<td>0.000</td>
</tr>
<tr>
<td>Liking Beta β₁j</td>
<td>291</td>
<td>-0.05</td>
<td>0.03</td>
<td>-1.773</td>
<td>0.077</td>
</tr>
<tr>
<td>Knowledge Beta β₂j</td>
<td>292</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.317</td>
<td>0.751</td>
</tr>
</tbody>
</table>

Table 8 – Study 3 Results from Hierarchical Linear Models (DV: Slack in Selected Category)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Beta Mean</th>
<th>Beta Std. Error</th>
<th>t</th>
<th>p (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept β₀j</td>
<td>282</td>
<td>3.98</td>
<td>0.20</td>
<td>20.220</td>
<td>0.000</td>
</tr>
<tr>
<td>Category Breadth Beta β₁j</td>
<td>282</td>
<td>0.35</td>
<td>0.06</td>
<td>5.688</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The above results show that broader categories resulted in higher money slack (mean Category Breadth β₁j = 0.35, t=5.688, p<.001), consistent with my original predictions and the results of study 1b, albeit inconsistent with study 1a. However, as people like a product more, they assign that product into narrower categories (mean Liking β₁j = -0.05, t=-1.773, p=0.077, marginal). In other words, as people like a product more, they assign it into the category that makes them perceive less money slack. This is contrary to my predictions. These results also
show that propensity to plan did not affect categorization level ($\beta_{PTP} = .064$, $t=.980$, $p=.328$), nor does it moderate the effect of liking on categorization ($\beta_{PTP} = .033$, $t=1.399$, $p=.163$).

Next, I explored whether these patterns of results are mirrored by similar effects of liking and knowledge on money slack. Thus, I ran HLM models similar to models (1), (2) and (3), but with Slack in the Selected Category as the DV, instead of Category Breadth. The results of these HLM models are presented in the tables below. These results in the table below are also presented in a similar way to the presentation of the previous tables.

Table 9 – Study 3 Results from Hierarchical Linear Models (DV: Slack in Selected Category)

| Compare the Means of Intercept $\beta_0$, Betas $\beta_1$ and $\beta_2$ with 0 Slack in Selected Category $\gamma_{ij} = \beta_{0j} + \beta_{1j}\text{Liking}_{ij} + \beta_{2j}\text{Knowledge}_{ij} + e_{ij}$ | Predicting $\beta_0$ and $\beta_1$ by Propensity To Plan (PTP) Mean Centered |
|---|---|---|---|
| | $N$ | Beta Mean | $t$ | $p$ | Beta of PTP | $t$ | $p$ |
| Intercept $\beta_{0j}$ | 288 | 5.00 | 29.638 | 0.000 | .176 | 1.128 | .260 |
| Liking Beta $\beta_{1j}$ | 280 | -0.07 | -1.452 | 0.148 | -0.012 | -2.76 | .783 |
| Knowledge Beta $\beta_{2j}$ | 284 | 0.17 | 3.641 | 0.000 | |

Again, similar to table 8, the section on the left of the table above shows the results of the level 1, within-subject model, and the section on the right shows the results of the level 2, across-subject models. In the section on the left, the column “Beta Mean” shows the means of the intercept $\beta_0$, of the Liking coefficient $\beta_1$, and of the Knowledge coefficient $\beta_2$ in the within-subject model. The columns “$t$” and “$p$” in the section on the left of the table show the statistical significance when comparing these means with 0. In the section on the right of the table, each row shows the coefficient of Propensity to Plan, and the statistical significance of these coefficients of Propensity to Plan, when predicting the intercept or coefficient of the level 1 model. From the above table, Liking did not affect Slack in the Selected Category (Liking $\beta_{1j} = -$
0.07, t=-1.452, p=0.148). Surprisingly, the directional effect was that more liking led to less perceived money slack. But the surprising effect was not statistically significant as it was for Categorization Breadth In these data, Propensity to Plan did not affect perceived Slack ($\beta_{PTP} = .176, t=1.128, p=.260$), nor did it affect the effect of Liking on perceived Slack ($\beta_{PTP}=-.012, t=-.276, p=.783$).

The proposed theoretical model of study 3, as well as the model updated according to the data, are presented again here for easier reference:

Proposed Theoretical Model of Study 3

Model from Data of Study 3

* Dotted lines denote marginal relations.
** Signs and arrows in red denote difference from predictions.

I had expected to find that consumers would use broader categories when they liked a product more to convince themselves that they had more slack. I found the opposite. Consumers judge themselves to have less resource slack when they use narrower categories and if they
assign narrow categories when they like a product more. Perhaps this reflects elastic categorization motivated by self-control, rather than choosing a level of categorization that permits the self-delusion that one has sufficient slack. Study 3A tests this idea.

4.2.3 Discussion

Reflecting on the absence of any effects from propensity to plan, I suspected that the Consumer Spending Self-Control measure (CSSC, Haws, Bearden, and Nenkov 2012) would be more closely related to categorization level, as well as the effect of liking on categorization, than is propensity to plan. Additionally, I would like to explore whether the surprising results from study 3, that people assign more liked products to narrower categories, were driven by a self-control mechanism. That is, individuals categorize the products they like strongly into the categories that make them feel less money slack in order to curtail their spending. Thus, if the results in study 3 are indeed driven by a self-control mechanism, the effect of liking on categorization level should be moderated by consumer spending self-control, as measured by Haws et. al.’s CSSC scale. Finally, the results in study 3 were surprising and contrary to predictions. Thus, I would like to see whether these results still hold after a replication.
4.3 Study 3a: Replicating Study 3, and Measuring CSSC

4.3.1 Method

Study 3a was designed to replicate the results of study 3, as well as testing whether CSSC would moderate the effect of liking on categorization, that is, whether CSSC would have the same effects with the predicted moderating effects of propensity to plan. Study 3a has the same procedure and measures with study 3. The only change from study 3 was that in 3a, participants answered the ten items of the CSSC scale after they filled out propensity to plan. The ten CSSC items were measured on 7-point scales ranging from 1 – *Strongly Disagree* to 7 – *Strongly Agree*. 300 participants from Amazon Mechanical Turk were recruited for this study.

4.3.2 Results:

CSSC scores were averaged, then mean-centered.

Then regression models similar to models 1, 2 and 3 in study 3 were run. The only difference is that the counterparts of models 2 and 3 in this study have one additional predictor in the model, mean-centered CSSC scores, besides propensity to plan. The two models (4) and (5) below only differ from each other in that model (4) includes Knowledge as a covariate, while model (5) does not. Models (4) and (5) produce different results.

\[(4) \text{Category Breadth}_{ij} = \beta_{0j} + \beta_{1j}^*Liking_{ij} + \beta_{2j}^*Knowledge_{ij} + \epsilon_{ij}\]

\[(5) \text{Category Breadth}_{ij} = \beta_{0j} + \beta_{1j}^*Liking_{ij} + \epsilon_{ij}\]

The results in the tables below show that the effect of Liking on Categorization Level was not significant when Knowledge was included in the model as a covariate ($\beta=-0.027$, $t=-1.118$, $p=.265$) – i.e, when Equation 4 was used as the first level model. But liking was
significant when I used Equation 5 as the first level model – i.e., when knowledge was not in the model ($\beta = -0.052$, t=-2.860, p=0.005). Liking and Knowledge about products are highly correlated at the individual level ($r_{\text{Liking Knowledge}} = 0.494$, p<.001), and the partial effect of Knowledge in Model 4 was not significant ($\beta = -0.015$, t=-.740, p=.460). Thus there was colinearity between the predictors when Knowledge was in the model, which just increased the standard errors on the coefficient for Liking. As a result, in these data, model 5 was better than model 4, due to the absence of colinearity.

Thus, the findings in study 3 that people categorize products that they like more into narrower categories were replicated in study 3a, albeit only when the covariate Knowledge about products was not included in the model.

Also similar to study 3a, when I estimate the level 2 model, attempting to explain individual differences in the coefficients in Equation 5, the results in the tables below also show that neither propensity to plan nor consumer spending self-control affect a subject’s mean categorization level (Propensity to Plan $\beta = 0.007$, t=0.111, p=0.912; CSSC $\beta = -0.118$, t=-1.628, p=0.105), or the effect of liking on categorization (Propensity to Plan $\beta = 0.029$, t=1.483, p=0.139; CSSC $\beta = -0.020$, t=-0.896, p=0.371). This means my self-control explanation for why I got the surprising effect that people use narrower categories the more they like a product is not supported.

\begin{align*}
(6) \beta_{0j} &= a + \gamma_1 \text{Propensity to Plan}_j + \gamma_2 \text{Consumer Spending Self-Control}_j + \epsilon'_{ij} \\
(7) \beta_{1j} &= c + \gamma_3 \text{Propensity to Plan}_j + \gamma_4 \text{Consumer Spending Self-Control}_j + \epsilon''_{ij}
\end{align*}
Table 10 – Study 3a Results from Hierarchical Linear Models - Category Breadth Chosen

Model 4

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Beta Mean</th>
<th>t</th>
<th>p</th>
<th>(2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept β₀j</td>
<td>280</td>
<td>3.167</td>
<td>46.498</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Liking Beta β₁j</td>
<td>273</td>
<td>-0.027</td>
<td>-1.118</td>
<td>.265</td>
<td></td>
</tr>
<tr>
<td>Knowledge Beta β₂j</td>
<td>274</td>
<td>-0.015</td>
<td>-.740</td>
<td>.460</td>
<td></td>
</tr>
</tbody>
</table>

Model 5

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Beta Mean</th>
<th>t</th>
<th>p</th>
<th>(2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept Liking β₀j</td>
<td>278</td>
<td>3.20</td>
<td>52.568</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Liking Beta β₁j</td>
<td>278</td>
<td>-0.05</td>
<td>-2.860</td>
<td>0.005</td>
<td></td>
</tr>
</tbody>
</table>

Next, I wished to test my conjecture that the effects of Liking and Propensity to Plan on Category Breadth are mirrored by the effects of Liking and Propensity to Plan on Slack in the Selected Category. I then ran similar HLM models, but predicting Slack in Selected Category instead of Category Breadth. The results are quite similar to the results of HLM model predicting Category Breadth. These results are presented in the tables below.
Table 11 – Study 3a Results from Hierarchical Linear Models

<table>
<thead>
<tr>
<th>Compare the Means of Intercept and Beta with 0 Slack in Selected Category ( y_{ij} = \beta_0 + \beta_{1j} \times \text{Liking}<em>{ij} + \beta</em>{2j} \times \text{Knowledge}<em>{ij} + \epsilon</em>{ij} )</th>
<th>Predicted by Propensity To Plan Mean Centered</th>
<th>Predicted by Consumer Spending Self-Control Mean Centered</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Mean</td>
<td>t</td>
</tr>
<tr>
<td>Intercept Liking ( \beta_{0j} )</td>
<td>271</td>
<td>4.82</td>
</tr>
<tr>
<td>Beta Liking ( \beta_{1j} )</td>
<td>265</td>
<td>0.01</td>
</tr>
<tr>
<td>Beta Knowledge ( \beta_{2j} )</td>
<td>265</td>
<td>0.24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compare the Means of Intercept and Beta with 0 Slack in Selected Category ( y_{ij} = \beta_0 + \beta_{1j} \times \text{Liking}<em>{ij} + \epsilon</em>{ij} )</th>
<th>Predicted by Propensity To Plan Mean Centered</th>
<th>Predicted by Consumer Spending Self-Control Mean Centered</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Mean</td>
<td>t</td>
</tr>
<tr>
<td>Intercept Liking ( \beta_{0j} )</td>
<td>269</td>
<td>4.96</td>
</tr>
<tr>
<td>Beta Liking ( \beta_{1j} )</td>
<td>269</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Finally, I wished to test my conjecture that the effect of Liking on Slack in the Selected Category was mediated by Category Breadth. I then ran two models at the individual subject level:

(a) Category Breadth \( y_{ij} = \beta_{0j} + \beta_{1j} \times \text{Liking}_{ij} + \epsilon_{ij} \)

(b) Slack in Selected Category \( y_{ij} = \beta_{0j} + \alpha_{ij} \times \text{Liking}_{ij} + \beta_{2j} \times \text{Category Breadth}_{ij} + \epsilon_{ij} \)

I then calculated a product \( \beta_1 \times \beta_2 \), and compared the mean of this product across subjects with 0. The mean of this product was -.0016. It was not different from 0 (\( t=-.111, p=.912 \)). Thus the predicted mediation was not supported.
Finally, another result from study 3 was also replicated: The results from the table below also show that broader categories made people perceive more money slack ($\beta = 0.23$, $t = 3.772$, $p < 0.001$).

<table>
<thead>
<tr>
<th>Table 12 – Study 3a Results from Hierarchical Linear Models of Resource Slack for Purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compare the Means of Intercept and Beta with 0 Slack In Selected Category</strong> $\bar{\gamma}<em>{ij} = \beta</em>{0j} + \beta_{1j} \times \text{Category Breadth}<em>{ij} + \varepsilon</em>{ij}$</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>Intercept $\beta_{0j}$</td>
</tr>
<tr>
<td>Beta Category Breadth $\beta_{1j}$</td>
</tr>
</tbody>
</table>

4.3.3 Discussion of Studies 3 and 3a

As expected, we found in both Studies 3 and 3a that categorizing more narrowly makes consumers feel less money slack. Surprisingly, both Studies 3 and 3a showed that as people like a product more, they categorize it more narrowly. Although surprising, these results in study 3 were replicated in study 3a. These patterns were not driven by a self-control mechanism. Neither individuals’ propensity to plan, nor consumer spending self-control, had any effects on categorization level. Nor did either trait affect the slope of the effect of liking on categorization.

It is unclear what the direction of these causal relations is: Does planning more (in more detailed categories) lead to less perceived slack money, or does perception of low slack causes more planning and thus narrower categories? Empirical evidence points to both directions. Tran and Lynch had earlier found negative relationships between propensity to plan and slack, which they interpreted in terms that people chronically low in slack learn to plan more. With correlational data, the direction of causality is ambiguous. There is experimental evidence that
planning causes perceived lack of slack (Jhang and Lynch 2013) and that perceived lack of slack causes planning (Fernbach, Lynch, and Kan 2013).

In studies 3 and 3a, I explored the hypothesis that, through level of categorization, liking affects perceived constraint, measured through resource slack. In the next section and study 4, I examined this relationship more directly by manipulating liking, and measuring the resulting resource slack.

In this paper I am interested generally in how individuals plan for and use their time and money resources. The previous sections of this dissertation have focused on studying individuals’ financial behaviors. In the next section, I will focus on how individuals plan for and use their time. I again consider how motivational factors might cause people to see more spare time for more liked activities.
Chapter 5. Do Liked Activities Lead to the “Yes-Damn” Effect More?

5.1 Conceptual Background

Although the results of studies 3 and 3a show that people categorize products they like more into narrower categories, i.e., into categories that make them feel less money slack, I would like to see whether people exhibit a different pattern when planning for time. Previous research shows that people exhibit very different patterns when thinking of time versus of money in many different domains (e.g., Liu & Aaker 2008, Okada & Hoch 2004, Saini & Monga 2008, Soman 2001). Thus, it is possible that people will also exhibit differential patterns when planning for these two resources.

People’s judgments of risks and benefits associated with an activity are influenced by how much they like the activity (Finucane, Alhakami, Slovic, Johnson 2000). One over-estimates the benefits and underestimates the risks of activities that one likes. This tendency may be extended to estimates of available resources for an activity or purchase.

When planning for an activity or purchase that one strongly likes, one may overestimate one’s available resources for this activity or purchase, leading to higher willingness to spend one’s resources. When the time approaches to carry out this activity, or when one actually commits the purchase, one is likely to recognize one’s overestimation of spare resources and regret one’s commitment to the activity or purchase. Thus, activities or purchases that one strongly likes may lead to regret for commitment more often than those one likes less. In other words, for temporal investments, activities one strongly likes may lead to the “Yes-Damn” effect (Zauberman and Lynch 2005) more often than activities one likes less. Study 4 below is designed
to provide initial evidence for the relation between one’s liking for an activity and how much spare time one thinks one has for that activity.

**H5: Stronger liking for activities leads to higher time slack for those activities.**

Considerable research has explored the effects of thinking about people, objects, or events as being psychologically distant or close to one. Research on construal level theory shows that psychological distance affects, among others, the type of features one focuses one when evaluating people, object or events. Psychological distance increases focus on desirability features, while psychological closeness increases focus on feasibility features (Trope & Liberman 2010). Thus, evaluating the desirability and feasibility of an activity temporally close or distant should differentially affect the overall appeal of the activity. If the activities are temporally distant, variance among activities in their desirability should have higher weight than if the same activities are temporally close because one is more focused on their desirability in the former case. If so, I would predict that stronger desire for the activity should distort one’s perceived spare time for that activity to an even greater degree.

**H6: I expect an interaction such that the perception of more time slack for strongly liked than for less liked activities is greater in the distant future than in the near future.**
5.2 Study 4: The Effect of Liking on Estimates of Spare Time

5.2.1 Method

Study Overview:

This study has a factorial design with two factors: 2 (Activity Liking: Strongly Liked vs. Less strongly Liked) x 2 (Future: Near vs. Distant). 235 participants from Amazon’s Mechanical Turk were recruited for this study.

Procedure:

*Manipulation of Activity Liking:* All participants were asked to list one activity that they could potentially complete within one day in the future. It was stated in the instruction that this must be an activity that participants did virtually every month, and that this activity could be completed within one day. Participants in the “Strongly Liked” condition are asked to list one activity that they like very much. Participants in the “Less Strongly Liked” condition are asked to list one activity that they like only slightly.

*Manipulation of Near vs. Distant Future:* On the next page, participants were presented with the activity that they listed on the previous page. Participants in the “Near Future” condition were asked to imagine that they had the opportunity to complete this activity within the next day. Participants in the “Distant Future” condition were asked to imagine that they were completing this activity within a day one month later.

All participants were then asked to indicate on an 11-point scale:
1) On the day that the participants imagined completing the activity, how much spare time they thought they had to complete that activity (1 – *Very little spare time* to 11 – *Lots of spare time*).

The below covariates were also measured:

2) Participants rated the importance of completing the activity (1 - *Not important at all* to 11 – *Very important*),

3) Participants filled out the scales for propensity to plan for time (not money) in the short and long term. There were two conditions with two different periods of time: Near future and Distant future. I measured propensity to plan for the use of time both for the short run (next 1-2 days) and for the long run (next 1-2 months). I expected that the propensity to plan scale for the short term would be more relevant for participants in the near future condition more, and the propensity to plan scale for the long term would be more relevant for participants in the distant future condition.

4) Finally, as a manipulation check, participants were asked to rate how much they like doing the activity in question (1 - *Not at all* to 11 – *Very much*).

**Dependent Variables:** The DV is the estimated spare time (i.e., time slack) available for the activity.

**5.2.2 Results:**

I predicted an interaction between Activity Liking and Near v. Distant Future. Specifically, I predicted that the strength of the tendency to see more spare time for activities one likes better will be greater in the distant future than in the near future. To test for this interaction,
as well as the predicted main effect of the degree of liking on time slack, I ran an ANCOVA with two between-subject factors, Degree of Liking for Activities (Strongly vs. Slightly), and Future (Near vs. Distant), three covariates, Propensity to plan for time in the long term, Propensity to plan for time in the short term, and Importance of completing the activity. The dependent variable is perceived spare time to complete the activity.

This ANCOVA test showed a significant main effect of the Degree of Liking on perceived spare time. Participants perceived that they had more spare time to complete activities that they liked strongly (M=7.22) than to complete activities that they liked only slightly (M=6.60, F(1, 228) = 5.14, p=.024). These results support hypothesis 5.

This ANCOVA test also showed a significant main effect of Near v. Distant Future condition. Participants thought they would have more time slack in the distant (M=7.75) than in the near future (M=6.11, F(1, 228) = 18.91, p<.001) to complete the activities they listed. These results replicate findings in other research (e.g., Zauberman and Lynch 2005, Berman, Tran, Lynch and Zauberman 2013): Individuals think they have more spare resources (time and money) in the distant future than in the present or near future.

This ANCOVA test, however, did not show an interaction between the Degree of Liking and Future condition F(1, 228) =.00, p=.997). Thus, hypothesis 6 was not supported.

Among the three covariates (propensity to plan for time in the long term, propensity to plan for time in the short term, and the importance of completing the activity), only propensity to plan for time in the long term was a significant covariate in this ANCOVA test. People with high propensity to plan for time in the long term perceived less spare time to complete activities (β = -.402, t(1, 228) =-2.03, p=.044). Propensity to Plan did not interact with Near vs. Distant future (β =
-.121, \( t(224) = .302, p = .763 \). Propensity to Plan for the short term had no effect in analyses so I only included propensity to plan for the long run in below analyses.

Figure 16. Study 4 Results: Spare Time for Activities That Are Liked Strongly and Liked Less Strongly in the Near and Distant Future

Time Slack
1 – Very little spare time, 11 – Lots of spare time

When does liking an activity more predict that the consumer will perceive more slack? And when does planning more (as measured by propensity to plan) predict less slack? I further explored the idea in study 3 that the effect of liking on resource slack is weaker for people with high propensity to plan, i.e., that although people think they have more spare time available for activities they like strongly, this tendency is less pronounced for people with high propensity to plan. To again explore this idea, I ran another ANCOVA test, with Time Slack as the DV. The three predictors are Liking condition (Less strongly = 1, Strongly = 2), Propensity to Plan for the Long Term, and the interaction between Liking and Propensity to Plan for the Long Term. Importance was a covariate.
As can be seen in Figure 17 there was a significant interaction between Liking and Propensity to Plan for the Long Term. The effect of liking on time slack is greater for people with low rather than high propensity to plan. An ANCOVA test showed that this interaction was indeed significant ($\beta=-0.972$, $t = -2.565$, $p = 0.011$). Figure 17 uses continuous liking measure (Mean Liking = 6.51, SD = 3.44.) while figures 18 uses the Liking Condition.

Figure 17. The Effects of Propensity to Plan on Spare Time at a Given Value of Liking

I further tested to see how the effect of liking on time slack changes from people with high to low propensity to plan. To do this, I ran the same ANCOVA test above several times with deviated propensity to plan for the long term scores (Mean propensity to plan = 3.12, SD =}
in effect performing the floodlight analysis procedure discussed by Spiller, Fitzsimons, Lynch and McClelland (2013). This floodlight procedure showed that the effect of liking on time slack was positive and significant for people with low propensity to plan for time in the long term ($\beta = 2.848$, $t = 3.175$, $p = 0.002$), but negative and marginal for people with high propensity to plan in the long term ($\beta = -2.011$, $t = -1.756$, $p = 0.080$). The complete result of this floodlight analysis is presented in figure 18 below.

These results provide supporting evidence for the idea initially proposed in study 3. People think they have more time available for activities that they like strongly than for those they like less strongly. We find in Study 4 that this motivated effect of liking on perceived spare time is stronger for people with low propensity to plan than for people with high propensity to plan.
Figure 18 is showing how the conditional *slope* of the relationship between liking for an activity and perception that one has spare time for that activity changes with propensity to plan for the use of one’s time in the long run. (Mean propensity to plan = 3.12, SD = 1.01.) For all levels of propensity to plan below 3.22 in figure 18, the more an activity is liked, the more people see that they have spare time for it. It is interesting that for very high levels of propensity to plan, liking an activity more leads to perceiving less spare time; the 95% confidence interval almost excludes zero.

I would like to explore these interesting results from a different angle. How does liking affect the strength of the relationship between Propensity to Plan for Time and estimated Spare Time? For this purpose, the continuous Liking scale, which was measured as a manipulation check, was used instead of the manipulated Liking conditions used in previous graphs. When Time Slack was regressed on Propensity to Plan for Time in the Long Run, the continuous
Liking manipulation check, the interaction between Propensity to Plan and Liking, controlling for Importance of completing the activity, the interaction Propensity to Plan x Liking was significant ($\beta = -0.163$, $t = -2.977$, $p = 0.003$). I used the same floodlight analysis procedure to explore how the effect of Propensity to Plan on Spare Time changes as Liking changes. Figure 19 shows the results in details.

![Weight of Propensity to Plan in the Long Run on Estimated Spare Time as a Function of Liking (1 = Low, 11 = High)](image)

Figure 19. Weight of Propensity to Plan in the Long Run on Estimated Spare Time as a Function of Liking (1 = Low, 11 = High)

The figure 19 is showing how the conditional slope of the relationship between propensity to plan for the use of one’s time in the long run and perception that one has spare time for an activity changes with one’s liking for that activity. Propensity to Plan did not affect estimated spare time for people who did not like the activity much. At the Johnson Neiman point of 6, depicted by the vertical line, Propensity to Plan started to have a significant negative effect on Spare Time:. Put differently, higher planners perceive less slack only for liked activities and not for less liked ones. Tran and Lynch had earlier found negative relationships between
propensity to plan and slack, which they interpreted in terms that people chronically low in slack learn to plan more. With correlational data, the direction of causality is ambiguous. There is experimental evidence that planning causes perceived lack of slack (Jhang and Lynch 2013) and that perceived lack of slack causes planning (Fernbach, Lynch, and Kan 2013). If causality runs from planning to slack, my Study 4 findings would imply that planning reduces slack only for positive activities. Perhaps people more uniformly perceive low slack for negative activities.

5.2.3 Discussion

Earlier I reported no support for my prediction that tendency to see more spare time for better liked activities in the distant future than in the near future. I suspected that one possible reason was that people did not think about the near and distant future carefully enough. Thus, I designed study 4a to replicate the results of study 4, and explore whether this interaction would become significant when people thought more carefully about their spare time to complete activities at these two points of time.
5.3 Study 4a – Replicating Study 4

5.3.1 Method

Study 4a had similar manipulation and procedure with study 4. The only change from study 4 was that, in study 4a, before rating their perceived spare time to complete their listed activities on the next day or a day one month later, participants were asked to think carefully through their schedule on that particular day. 301 mTurk participants were recruited for study 4a.

5.3.2 Results:

An ANCOVA test similar to the one in study 4 was conducted. The main effect of Liking on perceived spare time was replicated: People thought they would have more spare time to complete activities they like strongly (M=7.24) than to complete activities they like only slightly (M=6.44, F(1, 294)=6.10, p=.014). Thus, hypothesis 5 was again supported.

Similar to study 4, the interaction between Future and Liking was still not significant (F(1, 294)=.002, p=.965). Thus, hypothesis 6 was still not supported. This time, the main effect of Near v. Distant Future condition on perceived spare time ceased to be significant: Unlike in study 4, and unlike Zauberman and Lynch’s (2005), and Berman, Tran, Lynch and Zauberman’s findings in previous research, in study 4a, people did not think they would have more spare time to complete activities in the distant than in the near future.

I suspected that this was because the added manipulation of making participants think elaborately about their schedule made participants think less intuitively. Because estimate of resource slack is an intuitive estimate, the difference between the near and distant future that we found before was driven by the intuitive nature of participants’ estimate of resource slack. Thus,
the intensified elaboration added into study 4a eliminated the intuitive nature of these estimates, and as a result, also eliminated the difference in time slack between the near and distant future that we consistently found before.

In this study, neither propensity to plan for time (PPT) in the long run nor short run have any main effects on time slack. But PPT long run has a marginal interaction with the effects of liking on time slack ($\beta=.670$, $t=1.899$, $p=.059$). Similar to study 4, liking has a bigger and more positive effect on time slack for people with low propensity to plan in the long term than for people with high propensity to plan in the long term. The results of the floodlight analysis are presented in details in figure 20.

Figure 20. Weight of Liking on Estimated Spare Time as a Function of Propensity to Plan in the Long Run (1 = Low, 6 = High)

![Graph](image)

From figure 20: Liking increases time slack for people with low propensity to plan for the long term ($\beta=1.376$, $t=1.893$, $p=.059$). But liking did not have a significant effect on people with
high propensity to plan for the long term ($\beta= 0.054$, $t=0.060$, $p= 0.952$). Although the effect of Liking on time slack is marginal for people with the lowest level of propensity to plan, it becomes significant in people with propensity scores that are slightly higher but still in the lower range, i.e., with propensity scores from 1.25 to 3.55. The Johnson Neiman point, depicted by the vertical line, shows that the effect of liking on estimated spare time ceases to be significant for people with propensity score above 3.55.

Thus, this result is found in study 4, and is replicated in study 4a: The tendency to delude oneself that one has more spare time for activities one likes strongly, is more pronounced for people with low propensity to plan for time in the long run, than for people with high propensity to plan. In fact, this tendency is non-existent in people with high propensity to plan for time in the long run.

Also, similar to study 4, I would like to explore these interesting results again from a different angle: I wanted to see the effect of Propensity to Plan for Time in the Long Run on estimated Spare Time, as a function of Liking. For this purpose, similar to study 4, I used the continuous Liking scale, which was measured as a manipulation check. When Time Slack was regressed on Propensity to Plan for Time in the Long Run, the continuous Liking manipulation check, the interaction between Propensity to Plan and Liking, controlling for Importance of completing the activity, the interaction Propensity to Plan x Liking was marginal ($\beta= -0.089$, $t= -1.781$, $p= 0.076$). Using the same floodlight analysis procedure, I explored how the effect of Propensity to Plan on Spare Time changes as Liking changes. Figure 21 below shows the results.
5.3.3 Discussion of Studies 4 and 4a.

In Study 4a, unlike in study 4, the propensity to plan for the use of one’s time in the long run did not affect the perception that one has spare time for an activity at any level of liking (the confidence interval always included 0). However, the overall pattern of propensity to plan x liking interaction was replicated. In Study 4, the positive effect of liking on perceived spare time was found only for low planners. That same pattern recurred in Study 4a, as shown in Figure 19 above.

In study 4, the negative effects of planning on perceived spare time was found only for liked activities. In Study 4a, that is only marginally true at extreme positive levels of liking. However, the more people like an activity, the more high planners perceive less spare time than
low planners. People high in propensity to plan increasingly think they have less spare time for that activity. When people like an activity the least (liking =1) or the most (liking =11), the simple effect of propensity to plan almost became significant (the confidence interval almost excluded 0), positive for people who liked the activities least, and negative for people who liked the activities most.

In summary, in studies 4 and 4a I tested the relation between liking and one’s sense of spare resource by manipulating liking, and measuring the consequence of liking on one’s sense of spare resources. Here, I find that people do indeed perceive more spare time for activities the more they like them. Interestingly, this interacts with propensity to plan. Only those lower in propensity to plan have these elastic, motivated perceptions of spare time. Those extremely high in propensity to plan actually show a nonsignificant trend in the opposite direction.
Chapter 6. Conclusion

In summary, the ideas explored in this dissertation revolve around the relations between how detailed one’s budget is, and one’s planning and spending of resources. The first half of this dissertation focuses on an area of literature that has been relatively unexplored, namely, the “budget fallacy”. Although a large literature has been studying individuals’ tendency to repeatedly underestimate task completion time, much less empirical evidence exist for the tendency to underestimate future spending in the financial domain. Some recent work on the planning fallacy shows that as people plan more frequently, and in more details, they exhibit the planning fallacy for time more. In my dissertation, I explore this positive relation between the amount of planning and underestimation of resource used, in the financial domain. Additionally, I also used category size as a new operationalization of the extent of planning for money.

In the second half of my dissertation, I take on three major related questions. First, what determines the level of categorization consumers endogenously choose? Second, are consumers motivated to see things in a way that tells them that they have more slack for things they like? Third, do consumers categorize in a way that permits them to say “yes” to resource use by convincing themselves they have more slack.

Because category size was used in my dissertation as an operationalization of how detailed one’s budget is, I also explored factors that make people assign products or activities into different levels of categorization. Specifically, I explore how liking and propensity to plan affect people’s levels of categorization for products and activities.

The relation between one’s amount of planning and the accuracy of one’s plans has fundamental implications for individuals’ planning behavior. Additionally, the effects of one’s
liking for products and activities on one’s plan, including estimated spare resources, also have important consequences for individuals’ planning. Factors that interfere with accurate planning result in less efficient use of one’s resources.

In each study, I explore either the causes or the consequences of category size. In studies 1, 1a and 2, I explore several consequences of levels of categorization. In studies 3 and 4, I explore several causes of level of categorization. Table 13 provides a summary of the main conjectures advanced and tested in the dissertation, along with the results.

Table 13 – Summary of Conjectures and Results about Consequences of Category Size in Budgeting

<table>
<thead>
<tr>
<th>Conjectures</th>
<th>Tested in</th>
<th>Evidence from data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals exhibit the planning fallacy for money more as they budget for narrower product categories. (H1)</td>
<td>1, 1a, 1b</td>
<td>Supported in 1, 1a, 1b</td>
</tr>
<tr>
<td>Concreteness mediates the effects of category size on spending</td>
<td>1a</td>
<td>Not supported</td>
</tr>
<tr>
<td>Liking mediates the effects of category size on budget and spending</td>
<td>1a, 1b</td>
<td>Supported in 1a, 1b</td>
</tr>
<tr>
<td>Perceived constraint mediates the effects of category size on budget and spending</td>
<td>1a, 1b</td>
<td>Supported in 1a for budget but not spending; Not supported in 1b</td>
</tr>
<tr>
<td>Narrower categories increase liking</td>
<td>1a, 1b</td>
<td>Opposite findings in 1a, 1b</td>
</tr>
<tr>
<td>Narrower categories increase perceived constraint</td>
<td>1a, 1b</td>
<td>Opposite findings in 1a; Marginally supported in 1b</td>
</tr>
<tr>
<td>Higher liking increases budget and spending</td>
<td>1a, 1b</td>
<td>Supported in 1a, 1b</td>
</tr>
<tr>
<td>Higher perceived constraint decreases budget and spending</td>
<td>1a, 1b</td>
<td>Opposite findings in 1a, 1b</td>
</tr>
<tr>
<td>The broader the category, the more people perceive regularity from period to period in the resources expended. (H2a)</td>
<td>2</td>
<td>Not supported</td>
</tr>
<tr>
<td>Budgeting for broad product categories will result in higher confidence in one’s budget estimate from planners than budgeting for narrow product categories. (H2b)</td>
<td>2</td>
<td>Not supported</td>
</tr>
<tr>
<td>Prior Budgeting for broad product categories will lead to higher decisiveness in participants when they decide whether to incur an additional purchase. (H2c)</td>
<td>2</td>
<td>Not supported</td>
</tr>
<tr>
<td>Higher perceived regularity from period to period in the resources expended results in higher confidence in one’s budget estimate from planners</td>
<td>2</td>
<td>Supported</td>
</tr>
</tbody>
</table>
Table 14: Summary of Conjectures and Results about Causes of Category Size in Use of Money

<table>
<thead>
<tr>
<th>Conjectures about Causes of Category Size</th>
<th>Tested in</th>
<th>Evidence from data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals tend to post strongly liked purchases to broader mental categories than they do less liked purchases. (H3a)</td>
<td>3, 3a</td>
<td>Opposite findings in 3, 3a</td>
</tr>
<tr>
<td>Individuals’ tendency to post strongly liked purchases to broader mental categories increases the perceived resource slack in the category posted. (H3b)</td>
<td>3, 3a</td>
<td>Supported in 3, 3a</td>
</tr>
<tr>
<td>Individuals with high propensity to plan tend to think in terms of narrow categories more when planning. (H4a)</td>
<td>3, 3a</td>
<td>Not supported in 3, 3a</td>
</tr>
<tr>
<td>Individuals’ tendency to post strongly liked purchases into broad categories is weaker for people with high propensity to plan for money. (H4b)</td>
<td>3, 3a</td>
<td>Not supported in 3, 3a</td>
</tr>
<tr>
<td>Individuals with high consumer spending self-control tend to think in terms of narrow categories more when planning.</td>
<td>3a</td>
<td>Not supported</td>
</tr>
<tr>
<td>Individuals’ tendency to post strongly liked purchases into narrow categories is stronger for people with high spending self-control.</td>
<td>3a</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

Table 15: Summary of Conjecture and Results about Hedonic Effects of Liking for Activities on Perceived Spare Time for Those Activities

<table>
<thead>
<tr>
<th>Conjectures about Effects of Liking of Activities on Perceived Slack for Use of Time</th>
<th>Tested in</th>
<th>Evidence from data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stronger liking for activities leads to higher time slack for those activities. (H5)</td>
<td>4, 4a</td>
<td>Supported in 4, 4a</td>
</tr>
<tr>
<td>The perception of more time slack for strongly liked than for less liked activities is greater in the distant future than in the near future. (H6)</td>
<td>4, 4a</td>
<td>Not supported in 4, 4a</td>
</tr>
<tr>
<td>The effect of Liking on estimated spare time is smaller for people with high propensity to plan</td>
<td>4, 4a</td>
<td>Supported in 4, 4a</td>
</tr>
<tr>
<td>The effect of Propensity to Plan on estimated spare time is smaller for activities people like strongly</td>
<td>4, 4a</td>
<td>Supported in 4, 4a</td>
</tr>
</tbody>
</table>

In studies 1 and 1a, I study the effects of category size on willingness to spend. I had hypothesized that category size could affect budget and spending via two mediators: concreteness of one’s mindset, and perceived constraint. The effect of category size on willingness to spend through perceived constraint has already been demonstrated in previous research by Spiller (2011). Thus, one mediator of the effect of category size on spending through perceived constraint in this study is simply a replicate of Spiller’s findings.
Two sources of concreteness can affect willingness to spend in these studies:
Concreteness from temporal distance, and concreteness from the specificity of category size.
Although the concreteness of category size is present in both budgeting and shopping, budgeting is more temporally distant from the act of spending than shopping is. Under the (untested) assumption, based on Malkoc and Zauberman’s research, that concreteness is a positively accelerated function of psychological distance, I expected the effect of concreteness to be weaker in the budgeting than in the shopping stage. If the slope of the effect of concreteness on spending is steeper than its effect on budget, but if the slope of the effect of constraint on spending is similar for spending and budget, the effect of perceived (negative/positive) constraint on willingness to spend can dominate the effect of concreteness more in budgeting than in spending. As a result, the difference in willingness to spend between budgeting and shopping becomes larger as category size gets narrower.

Again, for easier reference, here is the original proposed model:
However, the results show that concreteness did not have any effects on any variables, nor was it affected by any variables in study 1a. Instead, another mediator, Liking for products, was proposed in the early rounds of the dissertation proposal to have the same mediational effects with concreteness. Narrow categories should evoke more affective responses to products than broad categories. Shopping should evoke more affective responses than budgeting due to being temporally closer to the act of spending on product. Although discussions during the dissertation proposal resulted in Liking being removed from the proposal, I included Liking in the studies for exploratory purposes. Liking, indeed, mediated the effects of category size on Budget and Spending. Broader categories increase Liking, contrary to predictions, and stronger Liking increase willingness to spend, consistent with predictions. In study 1a, broader categories increase perceived constraint, contrary to predictions, and higher perceived constraint increase budget and spending, contrary to predictions. In study 1b, which has better design than study 1a, broader categories decrease perceived constraint (marginal), consistent with predictions; and higher perceived constraint increase budget, contrary to predictions. In 1b, perceived constraint did not affect Spending, unlike in 1a.
In study 2, I explore another consequence of category size, specifically, planner’s confidence in the accuracy of her budget plan. I expected one’s confidence in the accuracy of one’s plan to affect how decisive one is when faced with a decision whether to incur an unplanned expense. I measured decisiveness by the time taken to make an up or down decision about an attractive item not in one’s budget. Perhaps because my response time measure was quite noisy, I found no support for any of my hypotheses about response time. I did, however,
find that higher perceived regularity of spending led to higher confidence in the accuracy of budgets.

Proposed Theoretical Model of Study 2

In studies 3 and 4, I explore several causes of level of categorization. In study 3, I focus on how the level of categorization consumers choose spontaneously depends on two causes, propensity to plan and liking for the products. I expected that liking affected one’s level of categorization through a sense of spare resource, such that liking increases categorization level. I found that as people liked a product more, they categorized it more narrowly, into the category that made them feel less spare money. Although surprising, these results were replicated in study 3a. These patterns were not driven by a self-control mechanism. Neither individuals’ propensity to plan, nor consumer spending self-control, had any effects on categorization level, nor on the effect of liking on categorization.

Proposed Theoretical Model of Study 3
In Study 3, I hypothesized that liking affected one's level of categorization and thus a sense of spare resource. In Studies 4 and 4a, I tested the relation between liking and one's sense of spare resource more directly, by manipulating liking, and measuring the consequence of liking on one's sense of spare resources. Here, I find that people do indeed perceive more spare time for activities the more they like them. Interestingly, this interacts with propensity to plan. Only those lower in propensity to plan have these elastic, motivated perceptions of spare time. Those extremely high in propensity to plan actually show a nonsignificant trend in the opposite direction.

I had hypothesized that this tendency to see more spare time for better liked activities would be stronger the more temporally distant the activities were. I found no support for that hypothesis in Study 4. Nor did I find support in Study 4a that attempted to strengthen my manipulation of temporal distance by asking people to think specifically about their schedules tomorrow versus on the same day next month.

Although the first three sections of the dissertation focus on financial domain, and the last section focuses on temporal domain, I expect these hypotheses to be generalizable in both domains. To my surprise, my results suggested that for money, the more people like a product, the less spare money they perceive. For time, however, the more people like an activity the more
spare time they perceive. This conflict requires a resolution. I speculate that these diverging results when people plan for the use of these two different resources – time and money, may be due to the different kinds of mindsets that these two resources might have activated. A significant body of existing literature has contrasted the different mindsets that time and money activate. Recent work suggests that time activates mindsets that promote the pursuit of social goals and emotional well-being (e.g., Mogilner 2010), while money activates mindsets that prohibit social goals, promote self-sufficiency, and make people less helpful (e.g., Vohs, Mead, and Goode 2006).

For now, these are simply speculations. This dissertation has many interesting findings, as well as several perplexing ones. One potential direction for future research is to empirically test these speculations, or explore other explanations for replicable findings that were contrary to predictions in this dissertation.
REFERENCES


APPENDIX

STUDIES 1A, 1B AND 2 - SCREENSHOTS OF STIMULI

Manipulation: Sorting Task in Broad Condition

Please sort the below products on the left into the appropriate category on the right. Click on a specific item in the list on the left and drag it to the right box on the right.

<table>
<thead>
<tr>
<th>Items</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safeway Instant Coffee ($0.50/oz, comes in container of either 7oz or 10oz.)</td>
<td></td>
</tr>
<tr>
<td>Nestle Instant Coffee ($1.30/oz, comes in container of either 7oz or 10oz.)</td>
<td></td>
</tr>
<tr>
<td>Juicy Juice Pineapple Juice ($4/6oz, comes in container of either 64oz or 32oz.)</td>
<td></td>
</tr>
<tr>
<td>Langers Pineapple Juice ($4.79/oz, comes in container of either 64oz or 32oz.)</td>
<td>Beverages</td>
</tr>
<tr>
<td>Celestial Herbal Tea ($12.90/count, comes in boxes of either 40 or 20 counts)</td>
<td></td>
</tr>
<tr>
<td>Tazo Herbal Tea ($20.00/count, comes in boxes of either 40 or 20 counts)</td>
<td></td>
</tr>
<tr>
<td>Safeway Grape Juice ($5.70/oz, comes in container of either 64oz or 32oz.)</td>
<td></td>
</tr>
<tr>
<td>Welch's Grape Juice ($7.10/oz, comes in container of either 64oz or 32oz.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Beverages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprouts Farmers Market Lamb ($4.95/lb)</td>
<td></td>
</tr>
<tr>
<td>New Zealand Lamb ($5.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Farmland Bacon ($7.98/lb, comes in packs of either 16oz or 12 oz)</td>
<td></td>
</tr>
<tr>
<td>Oscar Mayer Bacon ($10.66/lb, comes in packs of either 16oz or 12 oz)</td>
<td></td>
</tr>
<tr>
<td>Green Cauliflower ($2.99/lb)</td>
<td></td>
</tr>
<tr>
<td>White Cauliflower ($1.90/lb)</td>
<td></td>
</tr>
<tr>
<td>Regular Ground Pork ($2.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Jennie-O Extra Lean Ground Pork ($5.49/lb)</td>
<td></td>
</tr>
<tr>
<td>Russet Potatoes ($0.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Red Potatoes ($1.29/lb)</td>
<td></td>
</tr>
<tr>
<td>Product</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Safeway Ground Coffee</td>
<td>($6.80/oz, comes in bags of either 12oz or 16oz)</td>
</tr>
<tr>
<td>Starbucks Ground Coffee</td>
<td>($6.30/oz, comes in bags of either 12oz or 16oz)</td>
</tr>
<tr>
<td>Safeway Green Tea</td>
<td>($8.30/count, comes in boxes of either 40 or 20 counts)</td>
</tr>
<tr>
<td>Lipton Green Tea</td>
<td>($12.00/count, comes in boxes of either 40 or 20 counts)</td>
</tr>
<tr>
<td>Juicy Juice Orange Juice</td>
<td>($5.30/oz, comes in containers of either 84oz or 32oz)</td>
</tr>
<tr>
<td>Florida's Natural Orange Juice</td>
<td>($6.80/oz, comes in containers of 59oz)</td>
</tr>
<tr>
<td>Juicy Juice Cranberry Juice</td>
<td>($5.30/oz, comes in containers of either 84oz or 32oz)</td>
</tr>
<tr>
<td>Welch's Cranberry Juice</td>
<td>($6.30/oz, comes in containers of either 84oz or 32oz)</td>
</tr>
<tr>
<td>Sprouts Farmers Market Pork Loin Roast</td>
<td>($3.99/lb)</td>
</tr>
<tr>
<td>All Natural Supreme Lean Pork Loin Roast</td>
<td>($4.99/lb)</td>
</tr>
<tr>
<td>Sprouts Farmers Market Beef Steak</td>
<td>($5.99/lb)</td>
</tr>
<tr>
<td>Ranchers Reserve Beef Steak</td>
<td>($7.49/lb)</td>
</tr>
<tr>
<td>Eating Right Chicken Breast</td>
<td>($3.49/lb)</td>
</tr>
<tr>
<td>Sanderson Farms Chicken Breast</td>
<td>($4.49/lb)</td>
</tr>
<tr>
<td>Small Green Asparagus</td>
<td>($3.99/lb)</td>
</tr>
<tr>
<td>White Asparagus</td>
<td>($6.90/lb)</td>
</tr>
<tr>
<td>Roma Tomatoes</td>
<td>($5.99/lb)</td>
</tr>
<tr>
<td>Tomatoes on the Vine</td>
<td>($2.40/lb)</td>
</tr>
<tr>
<td>Safeway Apple Cider</td>
<td>($3.99/oz, comes in containers of either 64oz or 32oz)</td>
</tr>
<tr>
<td>Welch's Apple Cider</td>
<td>($5.50/oz, comes in containers of either 64oz or 32oz)</td>
</tr>
<tr>
<td>Safeway Grapefruit Juice</td>
<td>($4.70/oz, comes in containers of either 64oz or 32oz)</td>
</tr>
<tr>
<td>Ocean Spray Grapefruit Juice</td>
<td>($5.30/oz, comes in containers of either 64oz or 32oz)</td>
</tr>
</tbody>
</table>
Manipulation: Sorting Task in Narrow Condition

Please sort the below products on the left into the appropriate category on the right. Click on a specific item in the list on the left and drag it to the right box on the right.

**Items**

- Safeway Instant Coffee ($8.56/6oz., comes in container of either 7oz. or 10oz.)
- Nastic Instant Coffee ($1.30/oz., comes in container of either 7oz. or 10oz.)
- Juicy Juice Pineapple Juice ($4/6oz., comes in container of either 64oz. or 32oz.)
- Langers Pineapple Juice ($4.79/4oz., comes in container of either 64oz. or 32oz.)
- Celestial Herbal Tea ($12.35/cd/count, comes in box of either 40 or 20 counts)
- Tazo Herbal Tea ($20.80/cd/count, comes in box of either 40 or 20 counts)
- Safeway Grape Juice ($5.79/cd/count, comes in container of either 64oz. or 32oz.)
- Welch's Grape Juice ($7.19/cd/count, comes in container of either 64oz. or 32oz.)
- Sprouts Farmers Market Lamb ($4.99/lb)
- New Zealand Lamb ($5.99/lb)
- Farmland Bacon ($7.89/lb, comes in packs of either 15oz. or 12 oz.)
- Oscar Mayer Bacon ($10.68/lb, comes in packs of either 15oz. or 12 oz.)

**Categories**

- Instant Coffee
- Pineapple Juice
- Herbal Tea
- Grape Juice
<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Cauliflower ($2.99/lb)</td>
<td></td>
</tr>
<tr>
<td>White Cauliflower ($1.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Regular Ground Pork ($2.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Jennie-O Extra-lean Ground Pork ($6.49/lb)</td>
<td></td>
</tr>
<tr>
<td>Russet Potatoes ($0.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Red Potatoes ($1.29/lb)</td>
<td></td>
</tr>
<tr>
<td>Safeway Ground Coffee ($66.5oz, comes in bags of 12oz or 16oz)</td>
<td></td>
</tr>
<tr>
<td>Starbucks Ground Coffee ($83.3oz, comes in bags of 12oz or 16oz)</td>
<td></td>
</tr>
<tr>
<td>Safeway Green Tea ($8.3oz, comes in boxes of either 40 or 20 counts)</td>
<td></td>
</tr>
<tr>
<td>Lipton Green Tea ($12oz, comes in boxes of either 40 or 20 counts)</td>
<td></td>
</tr>
<tr>
<td>Juicy Juice Orange Juice ($5.3oz, comes in containers of either 54oz or 32oz)</td>
<td></td>
</tr>
<tr>
<td>Florida’s Natural Orange Juice ($6.8oz, comes in containers of 59oz)</td>
<td></td>
</tr>
<tr>
<td>Juicy Juice Cranberry Juice ($5.3oz, comes in containers of either 64oz or 32oz)</td>
<td></td>
</tr>
<tr>
<td>Welch’s Cranberry Juice ($6.8oz, comes in containers of either 64oz or 32oz)</td>
<td></td>
</tr>
<tr>
<td>Sprouts Farmers Market Pork Loin Roast ($3.99/lb)</td>
<td></td>
</tr>
<tr>
<td>All Natural Supreme Lean Pork Loin Roast ($4.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Sprouts Farmers Market Beef Steak ($5.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Ranchers Reserve Beef Steak ($7.49/lb)</td>
<td></td>
</tr>
<tr>
<td>Eating Right Chicken Breast ($3.49/lb)</td>
<td></td>
</tr>
<tr>
<td>Sanderson Farms Chicken Breast ($4.49/lb)</td>
<td></td>
</tr>
<tr>
<td>Small Green Asparagus ($3.99/lb)</td>
<td></td>
</tr>
<tr>
<td>White Asparagus ($5.99/lb)</td>
<td></td>
</tr>
<tr>
<td>Ground Pork</td>
<td></td>
</tr>
<tr>
<td>Bacon</td>
<td></td>
</tr>
<tr>
<td>Lamb</td>
<td></td>
</tr>
<tr>
<td>Cauliflower</td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td></td>
</tr>
<tr>
<td>Roma Tomatoes ($0.99/lb)</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Tomatoes on the Vine ($2.49/lb)</td>
<td></td>
</tr>
<tr>
<td>Safeway Apple Cider ($3.99/oz, comes in containers of either 64 oz or 32 oz)</td>
<td></td>
</tr>
<tr>
<td>Welch’s Apple Cider ($5.59/oz, comes in containers of either 64 oz or 32 oz)</td>
<td></td>
</tr>
<tr>
<td>Safeway Grapefruit Juice ($4.79/oz, comes in containers of either 64 oz or 32 oz)</td>
<td></td>
</tr>
<tr>
<td>Ocean Spray Grapefruit Juice ($6.39/oz, comes in containers of either 64 oz or 32 oz)</td>
<td></td>
</tr>
<tr>
<td>Ground Coffee</td>
<td></td>
</tr>
<tr>
<td>Green Tea</td>
<td></td>
</tr>
<tr>
<td>Orange Juice</td>
<td></td>
</tr>
<tr>
<td>Cranberry Juice</td>
<td></td>
</tr>
<tr>
<td>Pork Roast</td>
<td></td>
</tr>
<tr>
<td>Beef Steak</td>
<td></td>
</tr>
</tbody>
</table>
Chicken Breast

Asparagus

Tomatoes

Apple Cider

Grapefruit Juice
Stud ies 1a, 1b and 2

Budgeting Task in Broad Condition

Please imagine that you need to shop for enough consumption through ONE week. Below is the list of products you will buy for this week. You will first budget for how much you will spend in this week. After that, you will shop for those items that you budgeted.

Below is the list of products you will buy for this week. Please break your total budget for this week into each category so that you can buy enough for your own consumption in this week. Your total budget for groceries is about $50 per week on a typical week. However, it's up to you how much to spend. You can use up all your budget, or you can use less than your total budget.

Please enter your budget, in dollars, for each category into the text box next to it. If you will not buy an item, please enter 0.

SHOPPING LIST

Ground Coffee ($0.666/oz - $0.833/oz, comes in containers of 12oz or 16oz, for $7.99 - $13.33)
Green Tea ($0.083/count - $1.2/count, comes in boxes of 20 or 40 tea bags, for $1.66 - $4.80)
Orange Juice ($0.053/oz - $0.068/oz, comes in containers of 32oz, 59oz or 64oz, for $1.70 - $4.00)
Cranberry Juice ($0.053/oz - $0.063/oz, comes in containers of 32oz or 64oz, for $1.70 - $4.00)
Apple Cider ($0.039/oz - $0.055/oz, comes in containers of 32oz or 64oz, for $1.25 - $3.52)
Pork Roast ($3.99/lb - $4.99/lb)
Beef Steak ($5.99/lb - $7.49/lb)
Chicken Breast ($3.49/lb - $4.49/lb)
Asparagus ($3.99/lb - $5.99/lb)
Tomatoes ($0.99/lb - $2.49/lb)

BUDGET FOR:

<table>
<thead>
<tr>
<th>Beverages</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
</tr>
</tbody>
</table>

Budgeting Task in Narrow Condition

Please imagine that you need to shop for enough consumption through ONE week. Below is the list of products you will buy for this week. You will first budget for how much you will spend in this week. After that, you will shop for those items that you budgeted.

Below is the list of products you will buy for this week. Please break your total budget for this week into each category so that you can buy enough for your own consumption in this week. Your total budget for groceries is about $50 per week on a typical week. However, it's up to you how much to spend. You can use up all your budget, or you can use less than your total budget.

Please enter your budget, in dollars, for each category into the text box next to it. If you will not buy an item, please enter 0.
<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Coffee</td>
<td>$7.99 - $13.33</td>
<td>0</td>
</tr>
<tr>
<td>Green Tea</td>
<td>$1.66 - $4.80</td>
<td>0</td>
</tr>
<tr>
<td>Orange Juice</td>
<td>$1.70 - $4.00</td>
<td>0</td>
</tr>
<tr>
<td>Cranberry Juice</td>
<td>$1.70 - $4.00</td>
<td>0</td>
</tr>
<tr>
<td>Apple Cider</td>
<td>$1.25 - $3.52</td>
<td>0</td>
</tr>
<tr>
<td>Pork Roast</td>
<td>$4.99/lb</td>
<td>0</td>
</tr>
<tr>
<td>Beef Steak</td>
<td>$7.49/lb</td>
<td>0</td>
</tr>
<tr>
<td>Chicken Breast</td>
<td>$4.49/lb</td>
<td>0</td>
</tr>
<tr>
<td>Asparagus</td>
<td>$5.99/lb</td>
<td>0</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>$2.49/lb</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Studies 1a, 1b and 2

Shopping Task Instructions

You have just budgeted for enough consumption through ONE week. Now, you will shop for the items that you budgeted. For each product you will buy, you will see 2 options. Please indicate how much of each option you will buy.

Shopping for Ground Coffee in Broad Condition

AMOUNT YOU HAVE SPENT SO FAR:

on Beverages:    $  

on Food:        $  

TOTAL SPENT:    $  

SHOPPING LIST

Ground Coffee
Green Tea
Orange Juice
Cranberry Juice
Apple Cider
Pork Roast
Beef Steak
Chicken Breast
Asparagus
Tomatoes

You are now shopping for Ground Coffee. Please indicate how much you will buy of each of the two options below. Please enter the number of ounces into the text box. If you will not buy an option, please enter 0.

You can buy some of one option, but not the other, or some of both options, or none of both options.

<table>
<thead>
<tr>
<th>Safeway Ground Coffee ($66.6/oz)</th>
<th>Please enter the number of ounces you will buy into the text box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starbucks Ground Coffee ($93.3/oz)</td>
<td></td>
</tr>
</tbody>
</table>
## Shopping for Ground Coffee in Narrow Condition

**AMOUNT YOU HAVE SPENT SO FAR:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Coffee</td>
<td>$</td>
</tr>
<tr>
<td>Green Tea</td>
<td>$</td>
</tr>
<tr>
<td>Orange Juice</td>
<td>$</td>
</tr>
<tr>
<td>Cranberry Juice</td>
<td>$</td>
</tr>
<tr>
<td>Apple Cider</td>
<td>$</td>
</tr>
<tr>
<td>Pork Roast</td>
<td>$</td>
</tr>
<tr>
<td>Beef Steak</td>
<td>$</td>
</tr>
<tr>
<td>Chicken Breast</td>
<td>$</td>
</tr>
<tr>
<td>Asparagus</td>
<td>$</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>$</td>
</tr>
</tbody>
</table>

**TOTAL SPENT:** $
SHOPPING LIST

Ground Coffee
Green Tea
Orange Juice
Cranberry Juice
Apple Cider
Pork Roast
Beef Steak
Chicken Breast
Asparagus
Tomatoes

You are now shopping for Ground Coffee. Please indicate how much you will buy of each of the two options below. Please enter the number of ounces into the text box. If you will not buy an option, please enter 0.

You can buy some of one option, but not the other, or some of both options, or none of both options.

<table>
<thead>
<tr>
<th>Safeeway Ground Coffee ($86.6cloz)</th>
<th>Please enter the number of ounces you will buy into the text box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starbucks Ground Coffee ($83.3cloz)</td>
<td></td>
</tr>
</tbody>
</table>
STUDY 1A – SCREENSHOT OF STIMULI

Constraint measure - overall

In the task you just finished, how constrained did you feel that your financial situation was overall?

<table>
<thead>
<tr>
<th>1 - Not constrained at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11 - Extremely constrained</th>
</tr>
</thead>
</table>

Constraint measure – broad condition

In the task you just finished, how constrained did you feel that your financial situation was within each of the below product categories?

<table>
<thead>
<tr>
<th>1 - Not constrained at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11 - Extremely constrained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Constraint measure – narrow condition

In the task you just finished, how constrained did you feel that your financial situation was within each of the below product categories?

<table>
<thead>
<tr>
<th>1 - Not constrained at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11 - Extremely constrained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Coffee</td>
<td></td>
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<tr>
<td>Green Tea</td>
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<tr>
<td>Orange Juice</td>
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<tr>
<td>Cranberry Juice</td>
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<tr>
<td>Apple Cider</td>
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<tr>
<td>Pork Roast</td>
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<tr>
<td>Beef Steak</td>
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<tr>
<td>Chicken Breast</td>
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<tr>
<td>Asparagus</td>
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<tr>
<td>Tomatoes</td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

Concreteness measure – only a few examples are shown

Any behavior can be identified in many different ways. Below you will find several behaviors. After each behavior will be two choices of different ways in which the behavior might be described. Please choose the identification that you personally believe best describes the behavior.
Making a list

Getting organized

Writing things down

Reading

Following lines of print

Gaining knowledge

Joining the Army

Helping the Nation's defense

Signing up

Washing clothes

Removing odors from clothes

Putting clothes into the machine
STUDY 1B – SCREENSHOT OF STIMULI

Constraint measure

In the next steps of this study, you will budget, and then shop for enough groceries for your own consumption over one week. Your spending on groceries is approximately $50 on a typical week. Below are the products that you will budget and shop for.

Ground Coffee ($6.66/oz - $8.33/oz, comes in containers of 12oz or 16oz, for $7.99 - $13.33)
Green Tea ($0.86/count - $1.12/count, comes in boxes of 20 or 40 tea bags, for $1.66 - $4.80)
Orange Juice ($0.53/oz - $0.68/oz, comes in containers of 32oz, 59oz or 64oz, for $1.70 - $4.00)
Cranberry Juice ($0.53/oz - $0.63/oz, comes in containers of 32oz or 64oz, for $1.70 - $4.00)
Apple Cider ($0.359/oz - $0.55/oz, comes in containers of 32oz or 64oz, for $1.25 - $3.52)
Pork Roast ($3.99/lb - $4.99/lb)
Beef Steak ($5.99/lb - $7.49/lb)
Chicken Breast ($3.49/lb - $4.49/lb)
Asparagus ($3.99/lb - $5.99/lb)
Tomatoes ($0.99/lb - $2.49/lb)

How constrained do you feel that your financial situation will be if you have approximately $50 to budget and shop for the above products for enough consumption over one week?

<table>
<thead>
<tr>
<th>Not constrained at all</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>Extremely constrained</th>
</tr>
</thead>
</table>

We would like for you to think about your available spare money. This includes the money that you have left over that is not committed to be used in a given week.

If you have approximately $50 to budget and shop for the above products for your own consumption over one week, **how much available spare money do you think you will have?**

<table>
<thead>
<tr>
<th>Very little available money</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>Lots of available money</th>
</tr>
</thead>
</table>

Imagine that **this week** you had an unexpected expense of $100 such as a medical bill or a necessary car repair. How likely is it that you would be able to pay this bill in full and on time without having to dip into your retirement fund, borrow money or charge it to a credit card?

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>Very likely</th>
</tr>
</thead>
</table>

Liking for one set of product, broad condition
Again, here is the list of products that you will budget and shop for in the next tasks:

Ground Coffee
Green Tea
Orange Juice
Cranberry Juice
Apple Cider
Pork Roast
Beef Steak
Chicken Breast
Asparagus
Tomatoes

Please rate how much you like these products in each of the below categories:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Dislike</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Strongly Like</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
<td>(10)</td>
</tr>
<tr>
<td>Food</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beverages</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Liking for one set of product, narrow condition

Again, here is the list of products that you will budget and shop for in the next tasks.

Please rate how much you like these products in each of the below categories:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Dislike</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Strongly Like</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
<td>(10)</td>
</tr>
<tr>
<td>Ground Coffee</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Green Tea</td>
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<tr>
<td>Orange Juice</td>
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<td></td>
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<td></td>
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<tr>
<td>Cranberry Juice</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple Cider</td>
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<td></td>
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<tr>
<td>Pork Roast</td>
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<tr>
<td>Beef Steak</td>
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<td></td>
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</tr>
<tr>
<td>Chicken Breast</td>
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<td></td>
</tr>
<tr>
<td>Asparagus</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
### STUDY 2 – SCREENSHOTS OF STIMULI

**Confidence measure**

How confident do you feel that the budget you just created accurately predicts your spending in this week?

<table>
<thead>
<tr>
<th>1 - Not confident at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11 - Very confident</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Regularity**

How regular do you feel your weekly spending on **GROCERIES** is?

<table>
<thead>
<tr>
<th>1 - Very irregular</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11 - Very Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery Spending</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How regular do you feel your weekly spending on the **CATEGORIES OF GROCERIES** is?

<table>
<thead>
<tr>
<th>1 - Very irregular</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11 - Very Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spending on each category of groceries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Imagine that you see a delicious small box of Godiva chocolate. This box of chocolate is usually sold at $15, but is now sold at a reduced price of $8. Do you think that you can buy this box of chocolate and still afford what you planned to buy for this week?

Yes ☐

No ☐

This question will record how long the user spent on this page. The data will not be displayed to the recipient.
STUDY 3 – SCREENSHOTS OF STIMULI

Check of items bought in the past

We are interested in people’s spending pattern and how they think about their purchases. To start off, please check off **ALL** of the items below that you bought or spent money on in the last 12 months.

- Movies
- Clothes
- Eating out
- Traveling for pleasure
- Computers
- Gardening products
- Smart phones (i.e., a new smart phone, or smart phone services)
- Cars
- Music
- Outdoors Activities
- Sports gears
- Books
- Beauty and grooming products
- Gaming softwares or devices
- Pharmaceutical products
- Personal hygiene products
- Coffee
- Alcoholic beverages
- Cooking products or appliances
- Tablets

Open-ended categorization, only one example is shown

You will now see one product from each of the product class that you indicated that you spent money on in the last 12 months. For each product, please think about the **product category** that you normally classify the product into, then type that **product category** into the text box provided. For example: If you are presented with the product “Yoga Activities”, and you normally think of “Yoga Activities” as one form of “Exercising”, then you will type “Exercising” into the text box provided.

When you think of The Movie "Shawshank Redemption", what product category do you normally classify it into? Please type the product category that you normally classify The Movie "Shawshank Redemption" into in the text box below.

Categorization on scales, only one example is shown

You will now see an example from each of the product class that you indicated that you spent money on in the last 12 months. Secondly, you will also see the product category that you normally classify those products into, which you typed into the previous pages. Thirdly, you will see a scale that has many product categories. Please select on each of these scales the **product category** that is **CLOSEST, or MOST SIMILAR TO, the product category that you typed into** the previous pages.

For example: If one spent money on "Yoga Activities", and one normally thinks of "Yoga Activities" as one form of "Exercising", then one would choose the category **most similar to** "Exercising" on the scale provided.
You indicated that when you think of The Movie "Shawshank Redemption", you normally classify it into the product category of $q://QID4/ChoiceTextEntryValue$. Please select on the scale below the category that is most similar to $q://QID4/ChoiceTextEntryValue$.

Liking

How much do you like each of the below product or activity?

<table>
<thead>
<tr>
<th></th>
<th>Strongly dislike</th>
<th>Neither like nor dislike</th>
<th>Like very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Movie &quot;Shawshank Redemption&quot;</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Calvin Klein Jeans</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Eating out at Olive Garden</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Traveling to Greece</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Apple MacBook Pro</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Home Depot’s Plants and Seeds</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Samsung Android smart phones</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Slack in selected category

We would like for you to think about your available spare money. This includes the money that you have left over that is not committed to be used on anything. The following questions will ask you about your available spare money within various categories of products.

You indicated that when you think of The Movie "Shawshank Redemption", the category "$(q://QID30/ChoiceGroup/SelectedChoices)" is closest to the category that you normally classify this product into. Within the category of "$(q://QID30/ChoiceGroup/SelectedChoices)"", how much spare money do you think you have?
Knowledge, only a few products are shown as examples

How much do you know about each of the below product? Please rate your level of knowledge about each product, ranging from 1 - I do not know this product to 11 - I know this product extremely well.

<table>
<thead>
<tr>
<th>Product</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Movie “Shawshank Redemption”</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Calvin Klein Jeans</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
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<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Eating out at Olive Garden</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
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<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Traveling to Greece</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
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<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Apple MacBook Pro</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Home Depot's Plants and Seeds</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Samsung Android smart phones</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
</tbody>
</table>
STUDY 4 - SCREENSHOTS OF STIMULI

Manipulation: Listing of an activity that one likes only slightly

Please list one activity that you can potentially complete within one day in the future. This must be an activity that you do virtually every month, and you like it only slightly (i.e., you either feel neutral about it, or you just like it a little bit).

Manipulation: Listing of an activity that one likes very much

Please list one activity that you can potentially complete within one day in the future. This must be an activity that you do virtually every month, and you like it very much.
Manipulation: Distant Future

This is the activity that you listed previously:

Grocery shopping

Imagine that you are completing this activity ON A DAY ONE MONTH FROM TODAY. How much spare time do you think you will have ON A DAY ONE MONTH FROM TODAY to complete this activity?

Very little available time (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) Lots of available time (11)

Manipulation: Near Future

This is the activity that you listed previously:

Grocery shopping

Imagine that you are completing this activity TOMORROW. How much spare time do you think you will have TOMORROW to complete this activity?

Very little available time (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) Lots of available time (11)
Covariates: Importance

This is the activity that you listed previously:

Grocery shopping

Please rate on the scale below how important it is for you to complete this activity.

<table>
<thead>
<tr>
<th>Not important at all (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>Very important (11)</th>
</tr>
</thead>
</table>

Covariate: Propensity to Plan

We are trying to understand how people differ in how much they plan for time, and how the extent of planning differs for the short run (next 1 to 2 days) versus the long run (next 1 to 2 months).

We’d like to ask you to fill out two 6-question scales. Each scale asks you to agree or disagree with statements about your planning behavior in one of two domains:

a. use of your time in the short run (next 1 to 2 days)
b. use of your time in the long run (next 1 to 2 months)

The statements for the two scales are very similarly worded, but relate to different concepts. Please be careful to distinguish these concepts in answering the two scales.

Don’t feel compelled to say that you engage in a lot of planning. We are just as interested in when you do not engage in much planning as when you do engage in a lot of planning.

I consult my planner to see how much time I have left for the next few days.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I set goals for the next few days for what I want to achieve with my time.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>
I actively consider the steps I need to take to stick to my time schedule the next few days.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I like to look to my planner for the next few days in order to get a better view of using my time in the future.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I decide beforehand how my time will be used in the next few days.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

It makes me feel better to have my time planned out in the next few days.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

We are trying to understand how people differ in how much they plan for time, and how the extent of planning differs for the short run (next 1 to 2 days) versus the long run (next 1 to 2 months).

We’d like to ask you to fill out two 6-question scales. Each scale asks you to agree or disagree with statements about your planning behavior in one of two domains:

a. use of your time in the short run (next 1 to 2 days)

b. use of your time in the long run (next 1 to 2 months)

The statements for the two scales are very similarly worded, but relate to different concepts. Please be careful to distinguish these concepts in answering the two scales.

Don’t feel compelled to say that you engage in a lot of planning. We are just as interested in when you do not engage in much planning as when you do engage in a lot of planning.
<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>It makes me feel better to have my time planned out in the next 1-2 months.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I actively consider the steps I need to take to stick to my time schedule in the next 1-2 months.</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>I set goals for the next 1-2 months for what I want to achieve with my time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I consult my planner to see how much time I have left for the next 1-2 months.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to look to my planner for the next 1-2 months in order to get a better view of using my time in the future.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I decide beforehand how my time will be used in the next 1-2 months.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Covariate: Liking

This is the activity that you listed previously:

Grocery shopping

Please rate on the scale below how much you like this activity.

Not at all (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) Very much (11)